Attachment 1

ANO-2 Maximum Hypothetical Accident Control Room and Offsite Dose Analysis (LOCA)

PROC./WORK PLAN NO.	PROCEDURE/WORK PLAN TITLE:		
5010.015	ENGINEERING CALCULATIONS	CHANGE:	001-02-1

ARKANSAS NUCLEAR ONE
CALCULATION COVER SHEET

Calc. No.: 91-E-0117-16 **Rev. No.:** 0(3)

Calc. Title:
ANO-2 MHA CR and Offsite Dose Analysis

Unit: 2 **Category:** Q
System(s): RB, LPI, RBS, LPSI
Calc. Type: NS

Components: NA

Comp Tag	Suffix	Comp Code
N/A		

Topics: LOCA, CRHA, MHA, SGR, UPR
Plt Area: **Bldg.** 2AB **Elev.** N/A
Room N/A **Wall**
Coordinates: N/A

Config. Checklist (per 5010.004) completed? (Y or N) Y
Document Comment/Resolution Form completed? (Y or N) Y

Abstract (Included Purpose/Results):
This calculation: Evaluates the dose consequences of the maximum hypothetical accident at ANO Unit 2 considering steam generator replacement and the impacts of power uprate. It includes the dose from reactor building leakage, ESF valve leakage, and a passive component failure. This evaluation incorporates recent control room χ/Q values and revised spray lambdas, recirculation timing, containment cooling and spray start time, sump volumes, and containment air cooler flow rates.

Pages Revised and/or Added: Complete revision of calculation and Attachments 1through 10.

Purpose of Revision: SH 12/6/00
~~Attachment 2 was replaced in Rev. 0(1)~~. The TRANSACT input and output files for the ESF liquid leakage case were replaced in order to provide more detailed results needed for SAR Table 15.1.13-3. There were no changes to input parameters or results. The only change was selection of a print option that provided activity in each node for each time interval. Data from the more detailed TRANSACT output was added to the calculation body. Rev. 0(2) reflects the use of χ/Q values determined in Calc. 98-E-0030-09 Rev. 0(4). SH 12/06/00 A CR inleakage sensitivity study was also added. Additional time steps were added to passive failure cases in TRANSACT in response to CR-ANO-2-2000-0180. Rev. 0(3) added the change to the containment air cooler flow rates, corrected sump volume, spray start time and flows, and cooling start time. Rev 0(1) was voided based on no impact to later revisions. SH 12/6/00

Initiating Documents	Resulting Document(s)	Key Design Input Documents
ER 980528 E202, "Revise ANO2 Dose Calculations to Support Power Uprate".		95-E-0030-09, Rev. 0(4)
		See section 4

Verification Method: **Design Review** X **Alternate Calculation** ____ **Qualification Testing** ____

Amends Calc(s): 91-E-0117-01, Rev. 3
Supersedes Calc(s): 91-E-0117-18, Rev. 0
Computer Software Used: TRANSACT

	(Print Name)	(Initials)	(Date)		(Print Name)	(Initials)	(Date)
By:	Kathy Ashley	KLA	12/6/00	Rvw'd:	NA		
Chk'd:	Jacque Lingenfelter	JL	12/6/00	Apv'd	Stanley J. Haynes	SH	12/06/00

Check if Additional Revisions: ____

TABLE OF CONTENTS

1. PURPOSE 2
2. METHODOLOGY 2
3. ASSUMPTIONS 2
4. REFERENCES 3
5. CALCULATION 5
6. RESULTS 13

ATTACHMENT 1 MHACASE1.R5, MHACASE1.RV5
ATTACHMENT 2 MHACASE4.R5, MHACASE4.RV5
ATTACHMENT 3 MHACASE5.R5, MHACASE5.RV5
ATTACHMENT 4 CONTROL ROOM DOSE ANALYTICAL SOLUTION
ATTACHMENT 5 MHA1A.R5, MHA1A.RV5
ATTACHMENT 6 MHA1B.R5, MHA1B.RV5
ATTACHMENT 7 MHA1C.R5, MHA1C.RV5
ATTACHMENT 8 MHA1D.R5, MHA1D.RV5
ATTACHMENT 9 MHA4D.R5, MHA4D.RV5
ATTACHMENT 10 MHA5D.R5, MHA5D.RV5

1. PURPOSE

The primary purpose of this calculation is to evaluate the dose consequences of the maximum hypothetical accident at ANO Unit 2 considering steam generator replacement and the impacts of power uprate. It includes the dose from reactor building leakage, ESF valve leakage, and a passive component failure. This evaluation incorporates current control room χ/Q values and revised spray lambdas, recirculation timing, containment cooling start time, containment spray start time, sump volume and containment air cooler flow rate. The secondary purpose of this calculation is to evaluate the sensitivity of control room doses to control room inleakage.

2. METHODOLOGY

The methodology implemented in this calculation is provided in Regulatory Guide 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors [2]. This guide lists acceptable assumptions that may be used to evaluate the design basis LOCA of a Pressurized Water Reactor. Standard Review Plan 15.6.5, Loss-Of-Coolant Accidents Resulting from Spectrum of Postulated Piping Breaks within the Reactor Coolant Pressure Boundary [16], was also considered in the preparation of this calculation.

The TRANSACT computer code [20] is used to determine the control room, EAB and LPZ personnel doses post LOCA. TRANSACT has evolved from the TACT code which was originally developed by the Accident Evaluation Branch of the NRC. Revisions and modification of TACT resulted in several versions of the program. TRANSACT, which Omega Technical Services, Inc. documented in 1992 incorporated provisions for an eight-region plant model and determination of control room dose. TRANSACT simulates the movement of radioactivity hypothetically released from a reactor core as it migrates through user defined regions of the containment, is immobilized by sprays and plateout and is released from the containment to the environment. An analytical solution of the control room dose resulting from a passive failure is included in Attachment 4. This solution demonstrates the acceptability of the time steps selected for use in the TRANSACT passive failure evaluation.

3. ASSUMPTIONS

This calculation amends calculation 91-E-0117-01, rev.3 to evaluate the dose consequences of the maximum hypothetical accident at ANO Unit 2 considering steam generator replacement and the impacts of power uprate. This calculation supercedes calculation 91-E-0117-18, Rev. 0 which determined the dose consequences of the maximum hypothetical accident at ANO Unit 2 considering steam generator replacement but not the impacts of power uprate. This evaluation incorporates current control room χ/Q values and revised spray lambdas, recirculation timing, containment cooling start, containment spray start time, sump volume, and containment air cooler flow rate. In general, all other assumptions related to the Unit 2 MHA evaluation contained in 91-E-0117-01 are unchanged.

4. REFERENCES

1. ANO-2 SAR, Amendment 15
2. Regulatory Guide 1.4, "Assumptions Used for Evaluation the Potential Radiological Consequences of a Loss of Cooling Accident for Pressurized Water Reactors", Rev. 2, 1974
3. Calculation A-22, RB Net Free Volume, Rev. 2
4. Calculation A-28, RBSS Sprayed Volume. Rev. 0, 7/22/77
5. Calculation 91-E-0117-04, "ANO-1 and ANO-2 Control Room Free Air Volume", Rev. 0, 8/18/94
6. Standard Review Plan 6.5.2, "Containment Spray as a Fission Product Cleanup System", Rev. 2, December 1988
7. Standard Review Plan 6.4, "Control Room Habitability System", Rev. 2, July 1981
8. 2CNA117502, Request for Additional Information (Question 310.18), 11/11/1975
9. Calculation 95-E-0030-05, "Alternate Nuclide Library for Transact Code", Rev. 0, 2/6/97
10. Calculation 89-E-0164-06, ""Spray Lambdas and LOCA Radiation Doses Offsite with Reduced Spray Flow", Rev. 1, 2/5/93
11. Calculation 88-E-0032-12, Rev. 0(2), LOCA Containment Analysis for ANO-2 SGR and Power Uprate
12. Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release", June1974
13. Procedure 5120.415, In-Place Testing of the Unit 1 Control Room Filtration System, Rev. 004-00-0
14. Murphy and Campe, "Nuclear Power Plant Control Room Ventilation System Design for Meeting General Design Criterion 19", August 1974
15. Regulatory Guide 1.52, "Design, Testing and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants", Rev. 2, 1978
16. Standard Review Plan 15.6.5, Revision 2, July 1981, "Loss-of-coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within The Reactor Coolant Pressure Boundary"
17. Calculation 94-E-0070-05, "Spray Removal Constant and Decontamination Factors", Rev. 0, 1/22/97, CRN-99-163, CRN-00-359
18. Engineering Report 97-R-2002-01, "ECCS Leakage Quantities to Aux Building", Rev. 3
19. Supplement 2 to the Original Safety Evaluation Report for ANO Unit 2, Section 15.4.6
20. SP 93-C-0003-01, TRANSACT Code Documentation Package, Rev. 2, 1/29/97
21. Report No. 92-R-2018-01, Justification for a Mixed Containment, Rev.1
22. ANO-2 Technical Specification 4.7.6.1.2.b.1
23. TID 14844, Calculation of Distance Factors for Power and Test Reactor Sites, March 1962
24. Procedure 2104.007, Rev. 022-01-0, Control Room Emergency Air Conditioning and Ventilation
25. Calculation J-104, Post LOCA Dose Assessment, 03/24/78
26. 2CAN057801, "ECCS Pump Leakage", 5/1/78
27. 2CAN067823, "ECCS Pump Room Leakage", 6/20/78
28. 2CAN077804, "ECCS Pump Room Leakage", 7/7/78
29. 0CNA088706, "Survey of Arkansas Nuclear One, Units 1 and 2 Control Rooms", 10 August, 1987
30. Unit 2 FSAR, Amendment 39, 8/31/76

31. 0CAN0288111, "ANO Units 1 & 2 NUREG-0737 Item No. III.D.3.4 Control Room Habitability", March 13, 1981
32. NSD-SAE-ESI-98-175, Westinghouse to ABB-CE, "ANO-2 RSG Data Package, Rev. 3," dated April 29, 1998.
33. Engineering Calculation 98-R-2005-01, Rev. 6, "ANO-2 Cycle 15/16 Safety Analysis Groundrules"
34. Engineering Calculation 88-E-0097-06, Rev. 1, MSLB Containment Analysis
35. ANO-SGRP-99-0072
36. Calculation 89-E-0018-07, Dose Consequences of ECCS During Recirc Phase of Maximum Hypothetical Accident, Rev. 2.
37. ANO-2 SAR Table 6.2-20, Amendment No. 15
38. Engineering Calculation 90-E-0100-03, Revision 4, RWT Minimum and Maximum Volume
39. Engineering Calculation 94-E-0070-01, Revision 1, Containment Post LOCA pH Analysis Recommended Inputs
40. ULD-2-TOP-03, Revision 1, Containment Response to Design Basis Accidents.
41. Engineering Calculation 91-E-0007-01, Revision 1, ANO-2 Recommended Changes to the LBLOCA Input Assumptions
42. Engineering Calculation 95-E-0030-09, Rev. 0(4), "Control Room Atmospheric Dispersion Factors".

5. CALCULATION

TRANSACT Input Parameters

The TRANSACT computer code was used for this analysis. The input parameters as well as the reference(s) are given below.

Parameter	Unit 2	Reference
Power Level, Mwt	3026	[33]
Power Level for Analysis (102%)	3087	[33]
Fraction of iodine released from core	0.25	[2]
Fraction of noble gases released from core	1.0	[2]
Iodine species distribution	0.91 elemental 0.04 organic 0.05 particulate	[2]
RB Free Volume	1.778E6 ft^3	[3, 33]
Sump volume	62898 ft^3	p. 8 of this calc.
Sprayed volume	1.332E6 ft^3	RB_{free}-Unsp-Sump
Unsprayed volume	3.831E5 ft^3	[4, page 14]
Control Room volume	40,000 ft^3	[5]
Initial fraction	0.22 to unsprayed 0.78 to sprayed	Based on volume ratios
EAB X/Q	6.5E-4 sec/m^3	[2, Table 15.1.0-5]
LPZ X/Q's	3.1E-5 sec/m^3 0-8 hrs 3.6E-6 sec/m^3 8-24 hours 2.3E-6 sec/m^3 1-4 days 1.4E-6 sec/m^3 4-30 days	[8, Table 15.1.0-5]
CR X/Q's	9.77E-4 sec/m^3 0-2 hrs 5.76E-4 sec/m^3 2-8 hrs 2.56E-4 sec/m^3 8-24 hrs 1.68E-4 sec/m^3 1-4 days 1.25E-4 sec/m^3 4-30 days	[42]
Offsite Breathing Rates	3.47E-4 m^3/sec for 0-8 hours 1.750E-4 m^3/sec for 8-24 hrs 2.32E-4 m^3/sec for > 24 hours	[2]
Control Room Breathing Rates	3.47E-4 m^3/sec in CR throughout	[2]
DCFs	ICRP30	[9]
PRVS effective efficiency	N/A (Not credited for Unit 2)	N/A
CR Unfiltered Inleakage Flow	10 cfm	[7, 12]
CR Filtered Inleakage Flow	333 cfm	[13]
CR Recirculation Flow	1667 cfm	[13]
CR Occupancy Factors	1.0 for 0-24 hours 0.6 for 1-4 days 0.4 for 4-30 days	[14]
CR Intake Filter Efficiency	99%	[15]
CR Recirc Filter Efficiency	95%	[15]
RB mixing rates	11880 cfm between sprayed and unsprayed regions	[21] and p. 6 of this calc
RB leak rates	0.1%/day for 1st 24 hrs 0.05%/day >24hrs	[1, Table 15.1.13-1]
Spray Removal Rates		
Elemental	20 hr^{-1} till DF = 200 then 0 hr^{-1}	[17]
Organic	no removal	[6]
Particulate	3.97 hr^{-1} prior to recirc, 4.24 hr^{-1} (during recirc) till DF = 50, then 0.424 hr^{-1}	[17]
Containment cooling start	0.015 hr (= 52 sec + 3 sec)	[33]
RBS start	0.0175 hr (= 42.6 sec + 17.4 sec + 3 sec)	[15, 34]
Recirculation start time	0.43 hr	p. 9 of this calc

The ANO Unit 2 containment was modeled as two regions for this analysis. Three containment regions were identified which could have been used in modeling the containment; sprayed, unsprayed with good communication with the sprayed region and unsprayed with poor communication with the other regions. In reality, the internal volumes of the containment that have poor communication would not release activity directly to the environment. They would serve as a region of holdup of a portion of the activity thereby lessening the offsite and CR doses. For conservatism, the containment was modeled with a sprayed and an unsprayed region both of which release 0.1% of their volume directly to the environment. An instantaneous uniform distribution of the core release is assumed in the sprayed and unsprayed regions that consist of 78% and 22% of the containment volume respectively, based on volume ratios.

In the event that radioactivity is detected in the Unit 1 control room and/or the Unit 2 control room normal ventilation intake [24], both Unit 1 and Unit 2 emergency ventilation systems are initiated. One of the two systems is subsequently shutdown as one is sufficient to maintain habitability. Although both systems meet the design intent for control room habitability, the Unit 1 ventilation system is limiting since it has a 2 inch recirculation charcoal bed compared to a 4 inch bed on the Unit 2 system. Therefore, in the control room analysis, the Unit 1 system was assumed to be operating. Per the guidelines of R.G. 1.52, the recirculation filter efficiency of 95% was used.

Prior to the initiation of containment cooling at 55 seconds, flow between the containment regions is assumed to be zero. Use of zero flow between regions results in a singular matrix that cannot be solved by the methodology employed by TACT5 and TRANSACT. As discussed in NUREG/CR-3287, this problem can be addressed by making a slight change in the input parameters that has an insignificant impact on the results. It is for this reason that a flow of 1.0×10^{-6} %/day is transferred between the sprayed and unsprayed regions prior to the start of cooling.

Flow between the two containment regions was input as transfer percent per day. For conservatism, natural convection was neglected and only the containment air cooler flow of 54,000 cfm was assumed. Since the flow is distributed throughout containment, an exchange flow proportional to the volume fraction was used between the sprayed and unsprayed regions. The unsprayed region consists of 22% of the total containment volume; therefore 22% of the forced flow, 11880 cfm, is exchanged between the sprayed and unsprayed regions. This flow converts to a transfer percent of 1.284×10^{3} %/day for region 1 to 2 and 4.465×10^{3} %/day for region 2 to 1.

Containment spray elemental and particulate iodine removal efficiencies for ANO-2 were determined in Reference 17. The duration of the spray removal is established by the NRC in Standard Review Plan 6.5.2, "Containment Spray as a Fission Product Cleanup System". S.R.P.6.5.2 states that the effectiveness of spray in removing particulate iodine is reduced by a factor of ten when a decontamination factor of 50 is reached in the containment. After this reduction in the particulate iodine removal efficiency, there is no need to limit further particulate removal. In regard to elemental iodine removal, S.R.P.6.5.2 also states that the effectiveness of spray in removing elemental iodine ends when the maximum decontamination factor of 200 is reached in the containment. In accordance with S.R.P. 6.5.2, when the particulate iodine in the entire containment at the start of spray is reduced by 50 (at 1.853 hours), the removal efficiency is reduced from

4.24 hr^{-1} to 0.424 hr^{-1}. (Note that the particulate iodine removal efficiency is 3.97 hr^{-1} until the start of recirculation at 0.43 hours.) When the elemental iodine in the entire containment is reduced by 200 (at 1.98 hours), the removal efficiency is reduced from 20.0 hr^{-1} to 0.0 hr^{-1}. Attachment 1 contains expanded output to show that the particulate iodine at the start of sprays (0.0.0175 hr) has been reduced by 50 at 1.853 hours and the elemental iodine at the start of sprays (0.0175 hr) has been reduced by 200 at 1.98 hours.

The input and output files for this analysis (MHACASE1.R5, MHACASE1.RV5) are listed in Attachment 1. The results are listed below :

	EAB	LPZ	CR
Thyroid Rem	79.720	9.812	2.436
WB Rem	2.838	0.288	0.135
Skin Rem	6.451	0.667	4.712

EAB is the Exclusion Area Boundary, LPZ is the Low Population Zone and CR is the Control Room.

ESF Valve and Passive Component Leakage Outside of Containment

Standard Review Plan 15.6.5 [16] recommends that leakage from Engineered Safety Feature (ESF) components located outside containment be evaluated. This potential leakage will result in offsite radiological consequences that contribute to the total postulated maximum credible accident dose. Consideration of this leakage path is applicable to plants which do not provide an ESF atmospheric cleanup system in areas of potential leakage. The evaluation is to include contributions from recirculation component leakage and from the potential gross failure of a passive component.

In accordance with SRP 15.6.5, 50% of the core iodine activity, based upon the maximum reactor power level, is assumed to be mixed in the sump water which is circulated through the external piping systems. This recommendation is based on TID 14844 [23] assumptions that state that the iodine release for the maximum credible accident is 50% of the core inventory. As stated in TID 14844, 50% of this release is then assumed to remain airborne and 50% is assumed to absorb onto internal surfaces of the reactor building or adhere to internal surfaces. As a result, the assumption of 50% iodines mixed in the sump water, as provided in SRP 15.6.5, is very conservative since the LOCA analysis also assumes that 25% of the core inventory is airborne in the containment and available for release.

Component leakage

In accordance with SRP 15.6.5, Appendix B, the leakage to be used in evaluating the offsite dose contribution is the maximum operational leakage. This is taken as two times the sum of the simultaneous leakage from all components in the recirculation system above which the technical specifications would require declaring such systems to be out of service. There is no such technical specification for ANO-2. The recirculation system leakage rate for valves, flanges, and pump seals are provided below along with the additional data used in this evaluation:

Leakage Rate:	2060 cc/hr	Reference 18
Recirculation System Volume:	62898 ft^3	This calculation

The recirculation system volume is based on the following:

The reactor coolant system volume has been revised as a result of the steam generator replacement. Minimum RCS volume, 9875.5 ft^3 [32, 33], is reduced by 266 ft^3 [32, 33] to account for the assumption of 10% steam generator tube plugging. The minimum RCS volume that will be used in this analysis is 9609.5 ft^3.

The nominal volume of the Refueling Water Storage Tank (RWT) tank is 500,500 gallons [37]. Based on assessments of the RWT level setpoint and instrument uncertainties [38], a minimum inventory of 384,000 gallons is currently assumed [39].

The containment design basis accident assumes full safety injection to maximize the heat transferred from the reactor coolant system to the containment [40]. Credit for the volume of four safety injection tanks can therefore be taken when determining the volume of the containment sump. The minimum volume for one Safety Injection Tank (SIT) is 1350 ft^3. The basis for this volume has been documented in Reference 41. A total of 5400 ft^3 will be used in this calculation in the determination of the sump volume.

TANK	ft^3	Density lbm/ft^3	Mass lbm
RWT	51337 [39]	61.7	3,167,493
NaOH	0	n/a	
BAMT	0	n/a	
SITs	5400 [41]	61.4	331,560
RCS	9609.5 [32, 33]	44.31	425,797
Total			3,924,850

Then, for conservatism, using a density of 62.4 lbm/ft^3, the total sump volume is 62898 ft^3.

Sump volume is most important when calculating ESF doses since it effects the sump activity concentration. The sump volume is also used to determine the sprayed volume of the containment. But the sump volume is small compared to the containment volume, therefore; small changes in the sump volume have little effect on the resulting doses associated with containment leakage.

Time to Recirculation:

Recirculation of the containment sump volume begins when the RWT, the initial coolant source volume for the ESF pumps, is depleted. Since it is the intent of this calculation to determine conservative offsite and control room dose impacts, the minimum time to recirculation is required. Therefore, the minimum RWT volume and the maximum ESF pump availability and flow are used. It is assumed that two HPSI, two LPSI and two spray pumps operate, all at their maximum flowrate. The minimum time to recirculation of the containment sump is determined below.

$$V_{RWT} = 384{,}000\, gal.$$
$$Q_{\max} = Q_{LPSI} + Q_{HPSI} + Q_{SI} = 14250\, gpm$$
$$t_{\min} = {V_{RWT}}/{Q_{\max}} = 26.95 \text{ min}$$

Use 26 minutes.

where: Q_{LPSI} = 7540.5 gpm [35]
Q_{HPSI} = 1673.7 gpm [33]
Q_{Spray} = 5036 gpm [33]

Iodine Partition Coefficient: 10%

From reference 16, Appendix B, a partition factor of 0.1 for the ECCS leakage can be used if the flashing fraction is less than 10% or if the water is less than 212° F. Reference 36 demonstrated that a recirculation liquid temperature of 307° F is required to produce 10% flashing fraction at atmospheric conditions. Reference 11 shows that the maximum sump temperature during the ANO-2 DBA doesn't exceed 250° F, so that it may readily be assumed that the ECCS flash fraction is below 10%, and therefore a partition factor of 0.1 can be used for the ECCS leakage. This partition factor has been employed in evaluations of ESF valve leakage consistently going back to the FSAR, Amendment 21 dated July 11, 1974 (see section 15.1.13.4.1).

The time dependent accident EAB and LPZ χ/Q values, dose conversion factors, breathing rates and control room ventilation parameters are unchanged from the containment leakage analysis. Control room χ/Q values for a containment release were recently revised. They are documented in Calculation 95-E-0030-09 [42].

Per reference 20, the airborne iodine released from the ESF leakage is assumed to be immediately released to the environment with no removal by filtration. The input listing and computer output is given in Attachment 2 [MHACASE4.R5, MHACASE4.RV5]. The results are listed below.

	EAB	LPZ	CR
Thyroid Rem	2.451	1.046	0.311
WB Rem	0.007	0.001	0.000
Skin Rem	0.013	0.002	0.000

The iodine inventory in the containment sump at the time of recirculation start is given below (the Curies on the printout is multiplied by a factor of 10 to compensate for the modeling which implemented the iodine DF of 10):

I 131	3.865E+07
I 132	5.169E+07
I 133	8.555E+07
I 134	7.188E+07
I 135	7.535E+07

Passive Component Failure

Standard Review Plan 15.6.5 [16] states that plants that do not provide an ESF atmosphere filtration system should also evaluate the dose consequences of a gross failure of a passive component. The leakage from this component is conservatively assumed to be equivalent to 50 gpm, starting at 24 hrs after the accident and continuing for 30 minutes (a total leakage of 1500 gallons). The airborne iodine released from this leakage is also assumed to be immediately released to the environment without holdup or removal by filtration.

References 25-28 document the Unit 2 design basis of a 5-gallon per minute leak beginning 24 hours after an MHA, lasting for 30 minutes, in which it is conservatively assumed that all the activity that is in the 150 gallons of water is released. This analysis, as described in the ANO-2 SAR, does not require that the pump room doors be closed. The NRC acknowledges in reference 24 that they have reviewed this analysis, and then they do their own analysis assuming a 50 gpm leak which last 30 minutes (1500 gallons released), but assume that only 10% of the activity in the leaked coolant is released. These two assumptions are equivalent, in that they both result in effectively all the activity in 150 gallons of coolant being released to the environment.

The previous revisions of Calculation 91-0117-01 have made the following argument (quoted from Revision 2 of 91-E-0117-01):

As discussed in [Supplement 2 to the Unit 2 SER, section 15.4.6], the pump room is watertight with the doors closed. Although the rooms are not air tight, they do offer substantial isolation from the environment. As stated in [Supplement 2 to the Unit 2 SER, section 15.4.6], "...slow leakage of the contents, even for a day or two, would result in consequences at least a factor of four less than a short-term release." Therefore, the passive component failure release consequences was analyzed as a short-term, i.e. 30 minute, release of 1500 gallons. The resultant doses were divided by a factor of four to account for the pump room doors being closed.

A review of the entire discussion in section 15.4.6 of Supplement 2 to the Unit 2 SER [19] shows that the factor of four reduction in dose is due to the difference between the 0-8 hour χ/Q and the 1-4 day χ/Q. The NRC initial result of 370 Rem derived using the 0-8 hr χ/Q is reduced to 370/4 = 92 Rem as a result of their argument that closing the pump room doors will hold up the activity so that a 1-4 day χ/Q will be applicable. Because we have always used a 1-4 day LPZ and Control Room χ/Q in evaluating the dose consequences of the seal failure, we have already incorporated this reduction, and to divide the result by a factor of 4 would be double correcting. Note that for the original χ/Q values the 0-8 hours control room χ/Q is 5.6E-3 sec/m^3, while the 1-4 day χ/Q is 1.1E-3 sec/m^3, a factor of 5 lower. In addition, the modeling of the seal failure as occurring during the first 30 minutes of the 1-4 day period following an MHA and using the 1-4 day χ/Q should not be considered a short term release. By the NRC discussion, a short-term release would be represented by modeling the release as occurring in the first 30 minutes of an 8 hour period, using the 0-8 hour χ/Q.

This revision will use the original ANO-2 design basis, that is assuming that a 5 gpm seal failure occurs at 24 hours after the MHA, last 30 minutes, and that all the activity in the coolant is released to the environment. No filtration or plateout is credited, and the 1-4 day χ/Q's are used.

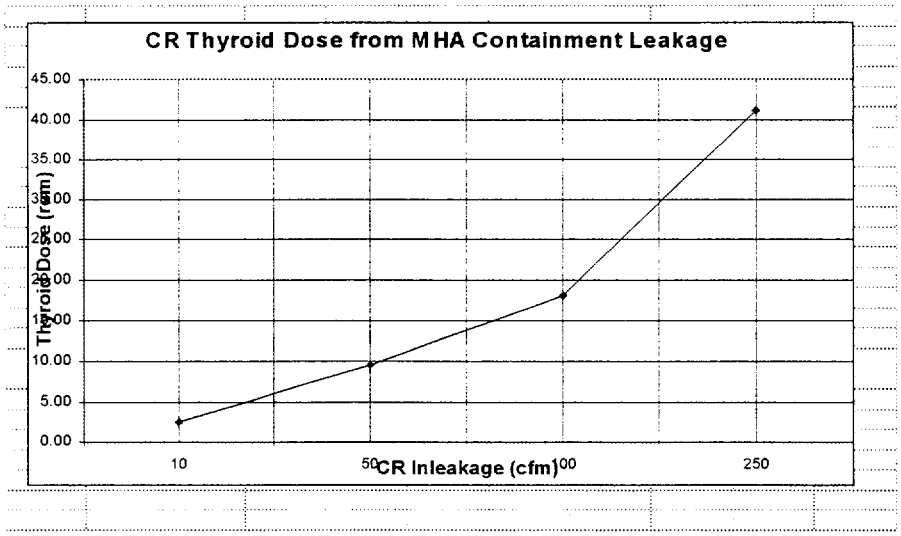
Fifty percent of the core iodine activity, based upon the maximum reactor power level, is assumed to be mixed in the sump water which is circulated through the external piping systems. Because the evaluation of seal leakage does not differentiate between the different iodine species, this revision assumes that 100% of the iodine is in the elemental form.

The TRANSACT input and output files for this evaluation are given in Attachment 3 [MHACASE5.R5, MHACASE5.RV5]. The results are listed below.

	EAB	LPZ	CR
Thyroid Rem	0.000	7.863	3.551
WB Rem	0.000	0.005	0.000
Skin Rem	0.000	0.011	0.001

Control Room Inleakage Sensitivity Study

The design basis dose calculations, above, were based on an assumed control room inleakage rate of 10 cfm. In this section, the sensitivity of the control room doses to the control room inleakage rate is determined. The CR dose associated with containment leakage (40% of the total thyroid dose) assuming 50, 100, and 250 cfm control room inleakage is calculated. The maximum inleakage that will result in CR doses below GDC 19 limits will be estimated and then using this maximum inleakage value the total MHA dose (including containment, ESF and passive failure leakage) will be determined. The TRANSACT input file MHACASE1.R5 was revised to increase control room inleakage and outleakage. A plot of the resulting CR thyroid doses as a function of CR inleakage is given below.



The TRANSACT input and output files for the 50, 100, and 250 cfm cases were MHA1A.R5 and MHA1A.RV5, MHA1B.R5 and MHA1B.RV5, and MHA1C.R5 and MHA1C.RV5, respectively. Using the plot above and the fact that the CR thyroid dose due to containment leakage represents 40% of the total CR thyroid dose, the maximum inleakage rate is estimated to be 61 cfm. The TRANSACT input and output files for the containment leakage, ESF leakage and passive failure leakage cases with 61 cfm CR inleakage are MHA1D.R5 and MHA1D.RV5, MHA4D.R5 and MHA4D.RV5, and MHA5D.R5 and MHA5D.RV5, respectively.

The total dose associated with the Maximum Hypothetical Accident postulated for ANO Unit *2 with 61 cfm CR inleakage* is given in the table below.

	CR
Thyroid Rem	29.620
WB Rem	0.140
Skin Rem	4.845

6. RESULTS

The design basis TRANSACT cases that were run are provided in Attachments 1, 2, and 3. The total dose associated with the design basis Maximum Hypothetical Accident postulated for ANO Unit 2 is given in Table 1 below.

Table 1

	EAB	LPZ	CR
Thyroid Rem	82.171	18.721	6.298
WB Rem	2.845	0.294	0.135
Skin Rem	6.464	0.680	4.713

ATTACHMENT 1

Unit 2 Reactor Building Leakage
TRANSACT Input and Output

(MHACASE1.R5, MHACASE1.RV5)

INPUT - MHACASE1.R5

```
'ICRP30A                                                                    '
'TILTAPE   ','TIMTAPE   ','TINTAPE   '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)               '
' MHACASE1.R5  UNIT 2 RB LEAKAGE '
'                                                                           '
 0, 0, 0, 1, 1
  2,  3
'RBSPRAY ', 'UNSPRAY'
 11
 3.087E+03, 0.000E+00
 .2500E+00, 1.000E+00
 .0000E+00, 0.000E+00
 .9100E+00, .0400E+00, .0500E+00
 1.000E+00, 0.000E+00, 0.000E+00
 1.332E+06, 3.831E+05, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.001E-02
'INITIAL FRACTION',0,0,0,0,2, 0.780E+00, 0.220E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.001E-02, 0.015E+00
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 0.001E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 0.001E-03, 0.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.015E+00, 0.0175E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 4.465E+03, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.0175E+00, 0.43E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 3.970E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.430E+00, 1.853E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 4.240E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.853E+00, 1.980E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.980E+00, 2.000E+00
'REMOVAL RATE    ',1,1,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 2.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.050E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.050E+00, 4.465E+03, 0.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output - MHACASE1.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   8:40:10

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)
  MHACASE1.R5  UNIT 2 RB LEAKAGE
1                            TIME INDEPENDENT INPUT
                               CASE NUMBER   1


                                 NODES  NSTEP
                                   2     11

                            OUTPUT CONTROL PARAMETER
                        I        1    2    3    4    5
                   IPRINT(I)     0    0    0    1    1

                   NUMBER OF DOSE EVALUATION POINTS -   3


                 POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          2.500E-01     1.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         2.500E-01     1.000E+00


                            ISOTOPIC SPLIT BY GROUP
                        ELEM.          ORG.          PART.
      HALOGENS       9.100E-01     4.000E-02     5.000E-02
                     1.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
            RBSPRAY        UNSPRAY
            1.332E+06      3.831E+05


                            CONTROL ROOM VOLUME (CU FT)
```

4.000E+04

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.2822800E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	ORG.	1.0032000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	PART.	1.2540000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.4634600E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	ORG.	1.5224000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	PART.	1.9030000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.1160200E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	ORG.	2.2488000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	PART.	2.8110000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	5.9832500E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	ORG.	2.6300000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	PART.	3.2875000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	4.6437300E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	ORG.	2.0412000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	PART.	2.5515000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
KR 83M	ELEM.	4.1520000E+03	3.7260000E-01	1.270E-05	0.000E+00	0.000E+00	1.360E-04	0.000E+00
KR 85M	ELEM.	1.2970000E+04	1.5786000E-01	2.310E-02	4.970E-02	0.000E+00	3.200E-02	0.000E+00
KR 85	ELEM.	4.1020000E+02	7.3512000E-06	3.310E-04	4.840E-02	0.000E+00	4.750E-04	0.000E+00
KR 87	ELEM.	2.3350000E+04	5.4684000E-01	1.330E-01	3.360E-01	0.000E+00	1.850E-01	0.000E+00
KR 88	ELEM.	3.2000000E+04	2.4750000E-01	3.380E-01	7.760E-02	0.000E+00	4.690E-01	0.000E+00
KR 89	ELEM.	3.9790000E+04	1.3068000E+01	3.030E-01	3.470E-01	0.000E+00	4.210E-01	0.000E+00
XE 131M	ELEM.	2.5950000E+02	2.4048000E-03	1.250E-03	1.330E-02	0.000E+00	2.710E-03	0.000E+00
XE 133M	ELEM.	1.3840000E+03	1.2564000E-02	4.190E-03	2.960E-02	0.000E+00	7.000E-03	0.000E+00
XE 133	ELEM.	5.6220000E+04	5.4792000E-03	4.960E-03	9.670E-03	0.000E+00	7.890E-03	0.000E+00
XE 135M	ELEM.	1.5570000E+04	2.6640000E+00	6.370E-02	2.140E-02	0.000E+00	9.160E-02	0.000E+00
XE 135	ELEM.	5.3630000E+04	7.5311970E-02	3.590E-02	6.320E-02	0.000E+00	5.070E-02	0.000E+00
XE 137	ELEM.	5.1030000E+04	1.0659600E+01	2.830E-02	4.590E-01	0.000E+00	4.020E-02	0.000E+00
XE 138	ELEM.	4.7750000E+04	2.4465600E+00	1.870E-01	1.470E-01	0.000E+00	2.610E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   1.00000E-05
INITIAL FRACTION       0    0    0    0    2   7.80000E-01   2.20000E-01
TIME INTERVAL          0    0    0    0    2   1.00000E-05   1.50000E-02
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
TRANSFER PERCENT       0    0    0    1    3   1.00000E-01   0.00000E+00
 1.00000E-06
TRANSFER PERCENT       0    0    0    2    3   1.00000E-01   1.00000E-06
 0.00000E+00
DOSE PARAMS            0    0    0    0    7   6.50000E-04   3.47000E-04
 3.10000E-05   3.47000E-04   9.77000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   1.50000E-02   1.75000E-02
TRANSFER PERCENT       0    0    0    1    3   1.00000E-01   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   1.00000E-01   4.46500E+03
 0.00000E+00
TIME INTERVAL          0    0    0    0    2   1.75000E-02   4.30000E-01
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   3.97000E+00   0.00000E+00
TIME INTERVAL          0    0    0    0    2   4.30000E-01   1.85300E+00
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E+00   0.00000E+00
TIME INTERVAL          0    0    0    0    2   1.85300E+00   1.98000E+00
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
```

```
REMOVAL RATE          1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL         0    0    0    0    2   1.98000E+00   2.00000E+00
REMOVAL RATE          1    1    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE          1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE          1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL         0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS           0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL         0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS           0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL         0    0    0    0    2   2.40000E+01   9.60000E+01
TRANSFER PERCENT      0    0    0    1    3   5.00000E-02   0.00000E+00
 1.28400E+03
TRANSFER PERCENT      0    0    0    2    3   5.00000E-02   4.46500E+03
 0.00000E+00
CONTROL ROOM          0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS           0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL         0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM          0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS           0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

ACTIVITIES (CI) AT END OF TIME STEP 1

CASE NUMBER 1

STEP START TIME AT 0.000E+00 (HRS) STEP END TIME AT 1.000E-05 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.822E+08	1.658E+08	1.294E+08	3.648E+07
	ORG.		7.290E+06	5.686E+06	1.604E+06
	PART.		9.112E+06	7.107E+06	2.005E+06
	ELEM.	1.045E+09	1.045E+09	8.151E+08	2.299E+08

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 1.000E-05 (HRS)

ISO	NAM	ENV.	RBSPRAY	UNSPRAY
I	131	0.000E+00	1.374E+07	3.875E+06
I	131	0.000E+00	6.039E+05	1.703E+05
I	131	0.000E+00	7.549E+05	2.129E+05
I	132	0.000E+00	2.085E+07	5.880E+06
I	132	0.000E+00	9.164E+05	2.585E+05
I	132	0.000E+00	1.146E+06	3.231E+05
I	133	0.000E+00	3.080E+07	8.686E+06
I	133	0.000E+00	1.354E+06	3.818E+05
I	133	0.000E+00	1.692E+06	4.773E+05
I	134	0.000E+00	3.602E+07	1.016E+07
I	134	0.000E+00	1.583E+06	4.465E+05
I	134	0.000E+00	1.979E+06	5.582E+05
I	135	0.000E+00	2.795E+07	7.884E+06
I	135	0.000E+00	1.229E+06	3.466E+05
I	135	0.000E+00	1.536E+06	4.332E+05
KR	83M	0.000E+00	9.997E+06	2.820E+06
KR	85M	0.000E+00	3.123E+07	8.808E+06

KR 85	0.000E+00	9.877E+05	2.786E+05
KR 87	0.000E+00	5.622E+07	1.586E+07
KR 88	0.000E+00	7.705E+07	2.173E+07
KR 89	0.000E+00	9.580E+07	2.702E+07
XE 131M	0.000E+00	6.248E+05	1.762E+05
XE 133M	0.000E+00	3.332E+06	9.399E+05
XE 133	0.000E+00	1.354E+08	3.818E+07
XE 135M	0.000E+00	3.749E+07	1.057E+07
XE 135	0.000E+00	1.291E+08	3.642E+07
XE 137	0.000E+00	1.229E+08	3.465E+07
XE 138	0.000E+00	1.150E+08	3.243E+07

INTEGRATED FILTER ACTIVITIES AT END OF... 1.000E-05 HOURS
ALL ACTIVITIES IN CI

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.

ACTIVITIES (CI) AT END OF TIME STEP 2

CASE NUMBER 1

STEP START TIME AT 1.000E-05 (HRS) STEP END TIME AT 1.500E-02 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.814E+08	1.651E+08	1.288E+08	3.632E+07
	ORG.		7.257E+06	5.660E+06	1.596E+06
	PART.		9.071E+06	7.075E+06	1.996E+06
	ELEM.	9.913E+08	9.913E+08	7.732E+08	2.181E+08

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.136E+02	1.033E+02	8.061E+01	2.274E+01
	ORG.		4.543E+00	3.543E+00	9.994E-01
	PART.		5.678E+00	4.429E+00	1.249E+00
	ELEM.	6.355E+02	6.355E+02	4.957E+02	1.398E+02

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 1.500E-02 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.100E+01	1.374E+07	3.875E+06
I 131	4.836E-01	6.039E+05	1.703E+05
I 131	6.044E-01	7.548E+05	2.129E+05
I 132	1.666E+01	2.076E+07	5.854E+06

I 132	7.322E-01	9.123E+05	2.573E+05
I 132	9.152E-01	1.140E+06	3.217E+05
I 133	2.465E+01	3.078E+07	8.682E+06
I 133	1.084E+00	1.353E+06	3.816E+05
I 133	1.355E+00	1.691E+06	4.770E+05
I 134	2.867E+01	3.559E+07	1.004E+07
I 134	1.260E+00	1.564E+06	4.412E+05
I 134	1.575E+00	1.955E+06	5.515E+05
I 135	2.237E+01	2.791E+07	7.872E+06
I 135	9.831E-01	1.227E+06	3.460E+05
I 135	1.229E+00	1.534E+06	4.325E+05
KR 83M	7.983E+00	9.942E+06	2.804E+06
KR 85M	2.498E+01	3.116E+07	8.788E+06
KR 85	7.909E-01	9.877E+05	2.786E+05
KR 87	4.484E+01	5.576E+07	1.573E+07
KR 88	6.158E+01	7.677E+07	2.165E+07
KR 89	6.966E+01	7.875E+07	2.221E+07
XE 131M	5.003E-01	6.248E+05	1.762E+05
XE 133M	2.668E+00	3.332E+06	9.398E+05
XE 133	1.084E+02	1.354E+08	3.818E+07
XE 135M	2.943E+01	3.602E+07	1.016E+07
XE 135	1.033E+02	1.290E+08	3.638E+07
XE 137	9.092E+01	1.047E+08	2.954E+07
XE 138	9.040E+01	1.108E+08	3.126E+07

CONTROL ROOM ACTIVITIES AT END OF... 1.500E-02 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	6.618E-05	1.672E-03	1.187E-06
I 131	2.909E-06	7.351E-05	5.216E-08
I 131	3.636E-06	9.189E-05	6.521E-08
I 132	9.999E-05	2.532E-03	1.794E-06
I 132	4.395E-06	1.113E-04	7.887E-08
I 132	5.494E-06	1.391E-04	9.859E-08
I 133	1.483E-04	3.748E-03	2.659E-06
I 133	6.518E-06	1.648E-04	1.169E-07
I 133	8.147E-06	2.059E-04	1.461E-07
I 134	1.714E-04	4.358E-03	3.080E-06
I 134	7.536E-06	1.916E-04	1.354E-07
I 134	9.419E-06	2.395E-04	1.693E-07
I 135	1.344E-04	3.400E-03	2.412E-06
I 135	5.910E-06	1.495E-04	1.060E-07
I 135	7.387E-06	1.868E-04	1.325E-07
KR 83M	1.254E-03	0.000E+00	0.000E+00
KR 85M	3.931E-03	0.000E+00	0.000E+00
KR 85	1.246E-04	0.000E+00	0.000E+00
KR 87	7.036E-03	0.000E+00	0.000E+00
KR 88	9.686E-03	0.000E+00	0.000E+00
KR 89	9.969E-03	0.000E+00	0.000E+00
XE 131M	7.883E-05	0.000E+00	0.000E+00
XE 133M	4.204E-04	0.000E+00	0.000E+00
XE 133	1.708E-02	0.000E+00	0.000E+00
XE 135M	4.546E-03	0.000E+00	0.000E+00
XE 135	1.627E-02	0.000E+00	0.000E+00
XE 137	1.324E-02	0.000E+00	0.000E+00
XE 138	1.399E-02	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 1.500E-02 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 2
CASE NUMBER 1

STEP START TIME AT 1.000E-05 (HRS) STEP END TIME AT 1.500E-02 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	2.793E+01	2.542E+01	1.983E+01	5.592E+00
		ORG.		1.117E+00	8.715E-01	2.458E-01
		PART.		1.397E+00	1.089E+00	3.073E-01
		ELEM.	7.207E+01	7.207E+01	5.621E+01	1.585E+01
SKIN-B	HALOGENS	ELEM.	9.349E+00	8.507E+00	6.636E+00	1.872E+00
		ORG.		3.740E-01	2.917E-01	8.227E-02
		PART.		4.674E-01	3.646E-01	1.028E-01
		ELEM.	9.065E+01	9.065E+01	7.071E+01	1.994E+01
THYROID	HALOGENS	ELEM.	1.000E+02	9.100E+01	7.098E+01	2.002E+01
		ORG.		4.000E+00	3.120E+00	8.800E-01
		PART.		5.000E+00	3.900E+00	1.100E+00
SKIN-G	HALOGENS	ELEM.	2.835E+01	2.580E+01	2.012E+01	5.676E+00
		ORG.		1.134E+00	8.846E-01	2.495E-01
		PART.		1.418E+00	1.106E+00	3.119E-01
		ELEM.	7.165E+01	7.165E+01	5.589E+01	1.576E+01
SKIN-T	HALOGENS	ELEM.	1.973E+01	1.795E+01	1.400E+01	3.950E+00
		ORG.		7.892E-01	6.156E-01	1.736E-01
		PART.		9.865E-01	7.695E-01	2.170E-01
		ELEM.	8.027E+01	8.027E+01	6.261E+01	1.766E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	6.681E-02	6.681E-02	6.681E-02	6.681E-02
SKIN-B	7.788E-02	7.788E-02	7.788E-02	7.788E-02
THYROID	4.305E+00	4.305E+00	4.305E+00	4.305E+00
SKIN-G	9.377E-02	9.377E-02	9.377E-02	9.377E-02
SKIN-T	1.717E-01	1.717E-01	1.717E-01	1.717E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.186E-03	3.186E-03	3.186E-03	3.186E-03
SKIN-B	3.714E-03	3.714E-03	3.714E-03	3.714E-03
THYROID	2.053E-01	2.053E-01	2.053E-01	2.053E-01
SKIN-G	4.472E-03	4.472E-03	4.472E-03	4.472E-03
SKIN-T	8.187E-03	8.187E-03	8.187E-03	8.187E-03

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	8.456E-06	8.456E-06	1.004E-01	1.004E-01
SKIN-B	3.953E-04	3.953E-04	1.171E-01	1.171E-01
THYROID	9.558E-04	9.558E-04	6.471E+00	6.471E+00
SKIN-G	1.180E-05	1.180E-05	1.410E-01	1.410E-01
SKIN-T	4.071E-04	4.071E-04	2.580E-01	2.580E-01

ACTIVITIES (CI) AT END OF TIME STEP 3

CASE NUMBER 1

STEP START TIME AT 1.500E-02 (HRS) STEP END TIME AT 1.750E-02 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.813E+08	1.650E+08	1.287E+08	3.630E+07
	ORG.		7.251E+06	5.656E+06	1.595E+06
	PART.		9.064E+06	7.070E+06	1.994E+06
	ELEM.	9.832E+08	9.832E+08	7.669E+08	2.163E+08

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.889E+01	1.719E+01	9.402E+01	2.652E+01
	ORG.		7.556E-01	4.133E+00	1.166E+00
	PART.		9.445E-01	5.166E+00	1.457E+00
	ELEM.	1.028E+02	1.028E+02	5.759E+02	1.624E+02

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 1.750E-02 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.284E+01	1.374E+07	3.875E+06
I 131	5.642E-01	6.038E+05	1.703E+05
I 131	7.052E-01	7.548E+05	2.129E+05
I 132	1.943E+01	2.074E+07	5.850E+06
I 132	8.540E-01	9.116E+05	2.572E+05
I 132	1.067E+00	1.140E+06	3.215E+05
I 133	2.876E+01	3.078E+07	8.682E+06
I 133	1.264E+00	1.353E+06	3.816E+05
I 133	1.580E+00	1.691E+06	4.770E+05
I 134	3.342E+01	3.551E+07	1.002E+07
I 134	1.469E+00	1.561E+06	4.404E+05
I 134	1.836E+00	1.951E+06	5.504E+05
I 135	2.609E+01	2.790E+07	7.871E+06
I 135	1.147E+00	1.226E+06	3.460E+05
I 135	1.434E+00	1.533E+06	4.325E+05
KR 83M	9.310E+00	9.932E+06	2.802E+06
KR 85M	2.914E+01	3.114E+07	8.785E+06
KR 85	9.228E-01	9.877E+05	2.786E+05
KR 87	5.228E+01	5.569E+07	1.571E+07
KR 88	7.183E+01	7.672E+07	2.164E+07
KR 89	8.001E+01	7.622E+07	2.150E+07
XE 131M	5.838E-01	6.248E+05	1.762E+05
XE 133M	3.113E+00	3.332E+06	9.398E+05
XE 133	1.265E+02	1.354E+08	3.818E+07
XE 135M	3.422E+01	3.578E+07	1.009E+07
XE 135	1.206E+02	1.290E+08	3.638E+07
XE 137	1.047E+02	1.020E+08	2.876E+07
XE 138	1.052E+02	1.102E+08	3.107E+07

CONTROL ROOM ACTIVITIES AT END OF... 1.750E-02 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	7.694E-05	1.951E-03	1.612E-06
I 131	3.382E-06	8.577E-05	7.085E-08
I 131	4.227E-06	1.072E-04	8.856E-08
I 132	1.162E-04	2.952E-03	2.435E-06
I 132	5.106E-06	1.297E-04	1.070E-07
I 132	6.382E-06	1.622E-04	1.338E-07
I 133	1.724E-04	4.373E-03	3.611E-06
I 133	7.577E-06	1.922E-04	1.587E-07

I 133	9.471E-06	2.403E-04	1.984E-07
I 134	1.989E-04	5.071E-03	4.174E-06
I 134	8.743E-06	2.229E-04	1.835E-07
I 134	1.093E-05	2.786E-04	2.293E-07
I 135	1.563E-04	3.966E-03	3.274E-06
I 135	6.869E-06	1.743E-04	1.439E-07
I 135	8.586E-06	2.179E-04	1.799E-07
KR 83M	1.461E-03	0.000E+00	0.000E+00
KR 85M	4.582E-03	0.000E+00	0.000E+00
KR 85	1.453E-04	0.000E+00	0.000E+00
KR 87	8.193E-03	0.000E+00	0.000E+00
KR 88	1.129E-02	0.000E+00	0.000E+00
KR 89	1.125E-02	0.000E+00	0.000E+00
XE 131M	9.192E-05	0.000E+00	0.000E+00
XE 133M	4.902E-04	0.000E+00	0.000E+00
XE 133	1.991E-02	0.000E+00	0.000E+00
XE 135M	5.265E-03	0.000E+00	0.000E+00
XE 135	1.897E-02	0.000E+00	0.000E+00
XE 137	1.503E-02	0.000E+00	0.000E+00
XE 138	1.621E-02	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 1.750E-02 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 3
CASE NUMBER 1

STEP START TIME AT 1.500E-02 (HRS) STEP END TIME AT 1.750E-02 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	2.870E+01	2.611E+01	2.037E+01	5.745E+00
		ORG.		1.148E+00	8.953E-01	2.525E-01
		PART.		1.435E+00	1.119E+00	3.157E-01
		ELEM.	7.130E+01	7.130E+01	5.562E+01	1.569E+01
SKIN-B	HALOGENS	ELEM.	9.879E+00	8.990E+00	7.012E+00	1.978E+00
		ORG.		3.951E-01	3.082E-01	8.694E-02
		PART.		4.939E-01	3.853E-01	1.087E-01
		ELEM.	9.012E+01	9.012E+01	7.029E+01	1.983E+01
THYROID	HALOGENS	ELEM.	1.000E+02	9.100E+01	7.098E+01	2.002E+01
		ORG.		4.000E+00	3.120E+00	8.800E-01
		PART.		5.000E+00	3.900E+00	1.100E+00
SKIN-G	HALOGENS	ELEM.	2.912E+01	2.650E+01	2.067E+01	5.830E+00
		ORG.		1.165E+00	9.086E-01	2.563E-01
		PART.		1.456E+00	1.136E+00	3.204E-01
		ELEM.	7.088E+01	7.088E+01	5.528E+01	1.559E+01
SKIN-T	HALOGENS	ELEM.	2.052E+01	1.868E+01	1.457E+01	4.109E+00
		ORG.		8.209E-01	6.403E-01	1.806E-01
		PART.		1.026E+00	8.004E-01	2.258E-01
		ELEM.	7.948E+01	7.948E+01	6.199E+01	1.749E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.

WHOLEBDY	1.080E-02	7.761E-02	1.080E-02	7.761E-02
SKIN-B	1.225E-02	9.013E-02	1.225E-02	9.013E-02
THYROID	7.178E-01	5.023E+00	7.178E-01	5.023E+00
SKIN-G	1.517E-02	1.089E-01	1.517E-02	1.089E-01
SKIN-T	2.742E-02	1.991E-01	2.742E-02	1.991E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	5.152E-04	3.702E-03	5.152E-04	3.702E-03
SKIN-B	5.842E-04	4.298E-03	5.842E-04	4.298E-03
THYROID	3.424E-02	2.395E-01	3.424E-02	2.395E-01
SKIN-G	7.233E-04	5.196E-03	7.233E-04	5.196E-03
SKIN-T	1.307E-03	9.494E-03	1.307E-03	9.494E-03

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	2.998E-06	1.145E-05	1.624E-02	1.167E-01
SKIN-B	1.388E-04	5.340E-04	1.841E-02	1.355E-01
THYROID	3.423E-04	1.298E-03	1.079E+00	7.550E+00
SKIN-G	4.185E-06	1.599E-05	2.280E-02	1.637E-01
SKIN-T	1.430E-04	5.500E-04	4.121E-02	2.992E-01

ACTIVITIES (CI) AT END OF TIME STEP 4

CASE NUMBER 1

STEP START TIME AT 1.750E-02 (HRS) STEP END TIME AT 4.300E-01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	2.780E+07	1.855E+07	1.697E+06	1.685E+07
	ORG.		6.462E+06	5.027E+06	1.435E+06
	PART.		2.784E+06	1.504E+06	1.280E+06
	ELEM.	6.027E+08	6.027E+08	4.688E+08	1.339E+08

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	9.519E+02	7.460E+02	3.884E+02	4.791E+02
	ORG.		1.176E+02	9.568E+01	2.717E+01
	PART.		8.840E+01	6.477E+01	3.025E+01
	ELEM.	1.228E+04	1.228E+04	1.014E+04	2.878E+03

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 4.300E-01 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	9.564E+01	2.030E+05	2.016E+06
I 131	1.386E+01	6.013E+05	1.717E+05
I 131	1.060E+01	1.800E+05	1.531E+05
I 132	1.395E+02	2.715E+05	2.696E+06
I 132	1.976E+01	8.041E+05	2.296E+05
I 132	1.529E+01	2.407E+05	2.047E+05
I 133	2.135E+02	4.493E+05	4.462E+06
I 133	3.087E+01	1.331E+06	3.800E+05
I 133	2.365E+01	3.983E+05	3.388E+05
I 134	2.258E+02	3.776E+05	3.749E+06
I 134	3.076E+01	1.118E+06	3.193E+05

I 134	2.428E+01	3.347E+05	2.847E+05
I 135	1.920E+02	3.958E+05	3.930E+06
I 135	2.761E+01	1.172E+06	3.347E+05
I 135	2.120E+01	3.508E+05	2.984E+05
KR 83M	2.122E+02	8.494E+06	2.425E+06
KR 85M	6.935E+02	2.910E+07	8.309E+06
KR 85	2.269E+01	9.850E+05	2.812E+05
KR 87	1.151E+03	4.432E+07	1.265E+07
KR 88	1.679E+03	6.908E+07	1.973E+07
KR 89	3.902E+02	3.466E+05	9.896E+04
XE 131M	1.434E+01	6.225E+05	1.777E+05
XE 133M	7.634E+01	3.306E+06	9.438E+05
XE 133	3.106E+03	1.347E+08	3.846E+07
XE 135M	5.126E+02	1.189E+07	3.395E+06
XE 135	2.919E+03	1.247E+08	3.560E+07
XE 137	6.094E+02	1.252E+06	3.575E+05
XE 138	1.634E+03	4.004E+07	1.143E+07

CONTROL ROOM ACTIVITIES AT END OF... 4.300E-01 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	3.205E-04	1.454E-02	2.197E-04
I 131	4.874E-05	2.107E-03	2.997E-05
I 131	3.681E-05	1.612E-03	2.332E-05
I 132	4.418E-04	2.087E-02	3.099E-04
I 132	6.602E-05	2.989E-03	4.137E-05
I 132	5.036E-05	2.306E-03	3.256E-05
I 133	7.115E-04	3.240E-02	4.889E-04
I 133	1.080E-04	4.691E-03	6.653E-05
I 133	8.164E-05	3.592E-03	5.184E-05
I 134	6.507E-04	3.290E-02	4.741E-04
I 134	9.434E-05	4.613E-03	6.103E-05
I 134	7.321E-05	3.612E-03	4.895E-05
I 135	6.311E-04	2.902E-02	4.360E-04
I 135	9.541E-05	4.190E-03	5.904E-05
I 135	7.229E-05	3.214E-03	4.612E-05
KR 83M	2.789E-02	0.000E+00	0.000E+00
KR 85M	9.525E-02	0.000E+00	0.000E+00
KR 85	3.219E-03	0.000E+00	0.000E+00
KR 87	1.460E-01	0.000E+00	0.000E+00
KR 88	2.264E-01	0.000E+00	0.000E+00
KR 89	8.765E-03	0.000E+00	0.000E+00
XE 131M	2.034E-03	0.000E+00	0.000E+00
XE 133M	1.080E-02	0.000E+00	0.000E+00
XE 133	4.402E-01	0.000E+00	0.000E+00
XE 135M	4.358E-02	0.000E+00	0.000E+00
XE 135	4.077E-01	0.000E+00	0.000E+00
XE 137	1.730E-02	0.000E+00	0.000E+00
XE 138	1.444E-01	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 4.300E-01 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 4
CASE NUMBER 1

STEP START TIME AT 1.750E-02 (HRS) STEP END TIME AT 4.300E-01 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	1.588E+01	1.247E+01	4.970E+00	7.497E+00
		ORG.		1.945E+00	1.515E+00	4.302E-01

		PART.		1.470E+00	9.932E-01	4.772E-01
		ELEM.	8.412E+01	8.412E+01	6.552E+01	1.860E+01
SKIN-B	HALOGENS	ELEM.	6.595E+00	5.173E+00	2.054E+00	3.119E+00
		ORG.		8.100E-01	6.309E-01	1.792E-01
		PART.		6.112E-01	4.126E-01	1.987E-01
		ELEM.	9.341E+01	9.341E+01	7.276E+01	2.064E+01
THYROID	HALOGENS	ELEM.	1.000E+02	7.813E+01	3.027E+01	4.786E+01
		ORG.		1.253E+01	9.760E+00	2.773E+00
		PART.		9.336E+00	6.275E+00	3.061E+00
SKIN-G	HALOGENS	ELEM.	1.615E+01	1.268E+01	5.055E+00	7.626E+00
		ORG.		1.978E+00	1.540E+00	4.375E-01
		PART.		1.496E+00	1.010E+00	4.854E-01
		ELEM.	8.385E+01	9.385E+01	6.531E+01	1.854E+01
SKIN-T	HALOGENS	ELEM.	1.230E+01	9.651E+00	3.844E+00	5.807E+00
		ORG.		1.507E+00	1.173E+00	3.333E-01
		PART.		1.139E+00	7.690E-01	3.697E-01
		ELEM.	8.770E+01	8.770E+01	6.831E+01	1.939E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	9.619E-01	1.039E+00	1.277E+00	1.354E+00
SKIN-B	9.117E-01	1.002E+00	1.036E+00	1.126E+00
THYROID	3.766E+01	4.268E+01	1.180E+02	1.230E+02
SKIN-G	1.347E+00	1.456E+00	1.796E+00	1.905E+00
SKIN-T	2.259E+00	2.458E+00	2.832E+00	3.031E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	4.587E-02	4.957E-02	6.089E-02	6.459E-02
SKIN-B	4.348E-02	4.778E-02	4.942E-02	5.372E-02
THYROID	1.796E+00	2.036E+00	5.628E+00	5.867E+00
SKIN-G	6.425E-02	6.945E-02	8.564E-02	9.084E-02
SKIN-T	1.077E-01	1.172E-01	1.351E-01	1.446E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.469E-03	3.481E-03	1.919E+00	2.036E+00
SKIN-B	1.073E-01	1.078E-01	1.557E+00	1.693E+00
THYROID	1.981E-01	1.994E-01	1.774E+02	1.849E+02
SKIN-G	4.844E-03	4.860E-03	2.699E+00	2.863E+00
SKIN-T	1.121E-01	1.127E-01	4.257E+00	4.556E+00

ACTIVITIES (CI) AT END OF TIME STEP 5

CASE NUMBER 1

STEP START TIME AT 4.300E-01 (HRS) STEP END TIME AT 1.853E+00 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	6.079E+06	1.060E+06	9.577E+04	9.641E+05
	ORG.		4.838E+06	3.758E+06	1.080E+06
	PART.		1.815E+05	6.667E+04	1.148E+05
	ELEM.	4.488E+08	4.488E+08	3.486E+08	1.002E+08

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	7.388E+02	3.581E+02	4.208E+02	8.038E+02
	ORG.		3.287E+02	3.511E+02	1.005E+02
	PART.		5.198E+01	8.759E+01	5.942E+01
	ELEM.	2.997E+04	2.997E+04	3.343E+04	9.562E+03

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 1.953E+00 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.428E+02	1.522E+04	1.532E+05
I 131	5.958E+01	5.973E+05	1.717E+05
I 131	1.746E+01	1.060E+04	1.825E+04
I 132	1.953E+02	1.340E+04	1.349E+05
I 132	6.972E+01	5.256E+05	1.511E+05
I 132	2.338E+01	9.325E+03	1.606E+04
I 133	3.165E+02	3.230E+04	3.252E+05
I 133	1.300E+02	1.267E+06	3.644E+05
I 133	3.862E+01	2.249E+04	3.872E+04
I 134	2.901E+02	9.089E+03	9.149E+04
I 134	8.158E+01	3.566E+05	1.025E+05
I 134	3.356E+01	6.327E+03	1.089E+04
I 135	2.800E+02	2.576E+04	2.593E+05
I 135	1.107E+02	1.011E+06	2.906E+05
I 135	3.399E+01	1.793E+04	3.088E+04
KR 83M	7.147E+02	4.991E+06	1.435E+06
KR 85M	2.680E+03	2.321E+07	6.673E+06
KR 85	9.776E+01	9.834E+05	2.827E+05
KR 87	3.498E+03	2.032E+07	5.843E+06
KR 88	6.117E+03	4.850E+07	1.394E+07
KR 89	3.916E+02	2.905E-03	8.351E-04
XE 131M	6.171E+01	6.194E+05	1.781E+05
XE 133M	3.260E+02	3.242E+06	9.320E+05
XE 133	1.333E+04	1.334E+08	3.836E+07
XE 135M	7.463E+02	2.680E+05	7.706E+04
XE 135	1.193E+04	1.118E+08	3.215E+07
XE 137	6.157E+02	3.231E-01	9.288E-02
XE 138	2.483E+03	1.230E+06	3.536E+05

CONTROL ROOM ACTIVITIES AT END OF... 1.953E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	7.443E-05	1.163E-02	6.406E-04
I 131	6.793E-05	9.046E-03	2.462E-04
I 131	1.066E-05	2.646E-03	7.735E-05
I 132	7.947E-05	2.214E-02	6.963E-04
I 132	6.769E-05	9.552E-03	2.549E-04
I 132	1.138E-05	2.739E-03	8.395E-05
I 133	1.609E-04	4.656E-02	1.387E-03
I 133	1.458E-04	1.954E-02	5.305E-04
I 133	2.305E-05	5.702E-03	1.675E-04
I 134	7.815E-05	2.027E-02	7.079E-04
I 134	5.965E-05	9.200E-03	2.388E-04
I 134	1.119E-05	2.565E-03	8.511E-05
I 135	1.342E-04	3.844E-02	1.162E-03
I 135	1.196E-04	1.625E-02	4.391E-04
I 135	1.922E-05	4.720E-03	1.402E-04

KR 83M	5.304E-02	0.000E+00	0.000E+00
KR 85M	2.388E-01	0.000E+00	0.000E+00
KR 85	9.968E-03	0.000E+00	0.000E+00
KR 87	2.238E-01	0.000E+00	0.000E+00
KR 88	5.050E-01	0.000E+00	0.000E+00
KR 89	1.163E-05	0.000E+00	0.000E+00
XE 131M	6.279E-03	0.000E+00	0.000E+00
XE 133M	3.289E-02	0.000E+00	0.000E+00
XE 133	1.353E+00	0.000E+00	0.000E+00
XE 135M	8.557E-03	0.000E+00	0.000E+00
XE 135	1.141E+00	0.000E+00	0.000E+00
XE 137	6.259E-05	0.000E+00	0.000E+00
XE 138	3.356E-02	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 1.853E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 5
CASE NUMBER 1

STEP START TIME AT 4.300E-01 (HRS) STEP END TIME AT 1.853E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	6.327E+00	3.117E+00	2.820E-01	2.835E+00
		ORG.		2.758E+00	2.143E+00	6.149E-01
		PART.		4.519E-01	1.994E-01	2.524E-01
		ELEM.	9.367E+01	9.367E+01	7.279E+01	2.088E+01
SKIN-B	HALOGENS	ELEM.	3.172E+00	1.552E+00	1.404E-01	1.412E+00
		ORG.		1.395E+00	1.084E+00	3.110E-01
		PART.		2.251E-01	9.914E-02	1.260E-01
		ELEM.	9.683E+01	9.683E+01	7.524E+01	2.159E+01
THYROID	HALOGENS	ELEM.	1.000E+02	4.735E+01	4.284E+00	4.307E+01
		ORG.		4.577E+01	3.556E+01	1.021E+01
		PART.		6.885E+00	2.999E+00	3.886E+00
SKIN-G	HALOGENS	ELEM.	6.444E+00	3.175E+00	2.873E-01	2.888E+00
		ORG.		2.809E+00	2.183E+00	6.263E-01
		PART.		4.603E-01	2.032E-01	2.571E-01
		ELEM.	9.356E+01	9.356E+01	7.270E+01	2.086E+01
SKIN-T	HALOGENS	ELEM.	5.233E+00	2.574E+00	2.329E-01	2.341E+00
		ORG.		2.286E+00	1.776E+00	5.096E-01
		PART.		3.733E-01	1.647E-01	2.086E-01
		ELEM.	9.477E+01	9.477E+01	7.364E+01	2.113E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.671E+00	2.710E+00	2.717E+00	4.072E+00
SKIN-B	1.373E+00	2.375E+00	1.808E+00	2.935E+00
THYROID	3.502E+01	7.771E+01	4.007E+02	5.238E+02
SKIN-G	2.336E+00	3.793E+00	3.827E+00	5.732E+00
SKIN-T	3.709E+00	6.167E+00	5.635E+00	8.666E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	7.969E-02	1.293E-01	1.296E-01	1.942E-01
SKIN-B	6.548E-02	1.133E-01	8.624E-02	1.400E-01
THYROID	1.670E+00	3.706E+00	1.911E+01	2.498E+01
SKIN-G	1.114E-01	1.809E-01	1.825E-01	2.734E-01
SKIN-T	1.769E-01	2.941E-01	2.688E-01	4.133E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	2.884E-02	3.232E-02	4.084E+00	6.120E+00
SKIN-B	7.844E-01	9.022E-01	2.718E+00	4.411E+00
THYROID	5.005E-01	6.999E-01	6.023E+02	7.872E+02
SKIN-G	4.028E-02	4.515E-02	5.752E+00	8.615E+00
SKIN-T	8.347E-01	9.474E-01	8.470E+00	1.303E+01

ACTIVITIES (CI) AT END OF TIME STEP 6

CASE NUMBER 1

STEP START TIME AT 1.853E+00 (HRS) STEP END TIME AT 1.980E+00 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	5.744E+06	8.262E+05	7.465E+04	7.515E+05
	ORG.		4.744E+06	3.685E+06	1.059E+06
	PART.		1.740E+05	8.064E+04	9.335E+04
	ELEM.	4.422E+08	4.422E+08	3.435E+08	9.876E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	3.126E+01	4.964E+00	4.212E+02	8.084E+02
	ORG.		2.535E+01	3.708E+02	1.061E+02
	PART.		9.407E-01	8.798E+01	5.996E+01
	ELEM.	2.358E+03	2.358E+03	3.526E+04	1.009E+04

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 1.980E+00 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.436E+02	1.210E+04	1.218E+05
I 131	6.364E+01	5.970E+05	1.717E+05
I 131	1.761E+01	1.307E+04	1.512E+04
I 132	1.959E+02	1.025E+04	1.032E+05
I 132	7.324E+01	5.061E+05	1.455E+05
I 132	2.351E+01	1.108E+04	1.282E+04
I 133	3.182E+02	2.557E+04	2.574E+05
I 133	1.386E+02	1.262E+06	3.629E+05
I 133	3.994E+01	2.762E+04	3.197E+04
I 134	1.905E+02	6.525E+03	6.568E+04
I 134	9.389E+01	3.221E+05	9.260E+04
I 134	3.364E+01	7.048E+03	8.159E+03
I 135	1.814E+02	2.021E+04	2.034E+05
I 135	1.175E+02	9.975E+05	2.868E+05
I 135	3.425E+01	2.183E+04	2.527E+04
KR 83M	7.479E+02	4.760E+06	1.369E+06
KR 85M	2.937E+03	2.275E+07	6.540E+06
KR 85	1.045E+02	9.834E+05	2.828E+05

KR 87	3.632E+03	1.896E+07	5.451E+06
KR 88	6.442E+03	4.700E+07	1.351E+07
KR 89	3.916E+02	5.525E-04	1.588E-04
XE 131M	6.593E+01	6.192E+05	1.780E+05
XE 133M	3.481E+02	3.237E+06	9.306E+05
XE 133	1.424E+04	1.333E+08	3.833E+07
XE 135M	7.479E+02	1.911E+05	5.494E+04
XE 135	1.269E+04	1.108E+08	3.185E+07
XE 137	6.157E+02	8.344E-02	2.399E-02
XE 138	2.491E+03	9.014E+05	2.592E+05

CONTROL ROOM ACTIVITIES AT END OF... 1.980E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	5.564E-05	2.174E-02	6.597E-04
I 131	6.797E-05	9.661E-03	2.665E-04
I 131	8.161E-06	2.667E-03	8.013E-05
I 132	5.649E-05	2.142E-02	6.907E-04
I 132	6.292E-05	9.732E-03	2.651E-04
I 132	8.249E-06	2.657E-03	8.377E-05
I 133	1.197E-04	4.662E-02	1.423E-03
I 133	1.448E-04	2.077E-02	5.721E-04
I 133	1.755E-05	5.727E-03	1.729E-04
I 134	5.112E-05	1.838E-02	6.585E-04
I 134	4.866E-05	8.660E-03	2.319E-04
I 134	7.420E-06	2.329E-03	7.963E-05
I 135	9.860E-05	3.815E-02	1.181E-03
I 135	1.168E-04	1.708E-02	4.690E-04
I 135	1.444E-05	4.697E-03	1.434E-04
KR 83M	5.235E-02	0.000E+00	0.000E+00
KR 85M	2.430E-01	0.000E+00	0.000E+00
KR 85	1.036E-02	0.000E+00	0.000E+00
KR 87	2.154E-01	0.000E+00	0.000E+00
KR 88	5.075E-01	0.000E+00	0.000E+00
KR 89	2.071E-06	0.000E+00	0.000E+00
XE 131M	6.526E-03	0.000E+00	0.000E+00
XE 133M	3.414E-02	0.000E+00	0.000E+00
XE 133	1.406E+00	0.000E+00	0.000E+00
XE 135M	5.917E-03	0.000E+00	0.000E+00
XE 135	1.174E+00	0.000E+00	0.000E+00
XE 137	1.514E-05	0.000E+00	0.000E+00
XE 138	2.399E-02	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 1.980E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 6
CASE NUMBER 1

STEP START TIME AT 1.853E+00 (HRS) STEP END TIME AT 1.980E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	3.549E+00	5.638E-01	5.094E-02	5.128E-01
		ORG.		2.878E+00	2.235E+00	6.427E-01
		PART.		1.068E-01	4.459E-02	6.221E-02
		ELEM.	9.645E+01	9.645E+01	7.491E+01	2.154E+01
SKIN-B	HALOGENS	ELEM.	1.896E+00	3.011E-01	2.721E-02	2.739E-01
		ORG.		1.538E+00	1.194E+00	3.434E-01
		PART.		5.706E-02	2.382E-02	3.323E-02

		ELEM.	9.810E+01	9.810E+01	7.620E+01	2.191E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.588E+01	1.435E+00	1.444E+01
		ORG.		8.111E+01	6.300E+01	1.811E+01
		PART.		3.010E+00	1.257E+00	1.752E+00
SKIN-G	HALOGENS	ELEM.	3.613E+00	5.739E-01	5.186E-02	5.221E-01
		ORG.		2.930E+00	2.276E+00	6.543E-01
		PART.		1.087E-01	4.539E-02	6.334E-02
		ELEM.	9.639E+01	9.639E+01	7.486E+01	2.152E+01
SKIN-T	HALOGENS	ELEM.	1.980E+00	4.733E-01	4.277E-02	4.306E-01
		ORG.		2.417E+00	1.877E+00	5.397E-01
		PART.		8.968E-02	3.744E-02	5.224E-02
		ELEM.	9.702E+01	9.702E+01	7.535E+01	2.167E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.109E-01	2.821E+00	1.868E-01	4.259E+00
SKIN-B	9.064E-02	2.465E+00	1.238E-01	3.058E+00
THYROID	1.742E+00	7.945E+01	3.532E+01	5.591E+02
SKIN-G	1.552E-01	3.948E+00	2.633E-01	5.995E+00
SKIN-T	2.458E-01	6.413E+00	3.870E-01	9.053E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	5.291E-03	1.346E-01	9.911E-03	2.031E-01
SKIN-B	4.323E-03	1.176E-01	5.902E-03	1.459E-01
THYROID	8.306E-02	3.789E+00	1.684E+00	2.666E+01
SKIN-G	7.401E-03	1.883E-01	1.256E-02	2.859E-01
SKIN-T	1.172E-02	3.059E-01	1.946E-02	4.318E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.220E-03	3.554E-02	2.808E-01	6.401E+00
SKIN-B	8.779E-02	9.900E-01	1.860E-01	4.597E+00
THYROID	3.074E-02	7.306E-01	5.308E+01	8.403E+02
SKIN-G	4.500E-03	4.965E-02	3.957E-01	9.011E+00
SKIN-T	9.229E-02	1.040E+00	5.917E-01	1.361E+01

ACTIVITIES (CI) AT END OF TIME STEP 7

CASE NUMBER 1

STEP START TIME AT 1.980E+00 (HRS) STEP END TIME AT 2.000E+00 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	5.726E+06	8.237E-05	1.009E+05	7.228E+05
	ORG.		4.730E+06	3.674E+06	1.056E+06
	PART.		1.728E+05	8.225E+04	9.052E+04
	ELEM.	4.412E+08	4.412E-08	3.427E+08	9.854E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	4.780E+00	6.874E-01	4.213E+02	8.090E+02
	ORG.		3.948E+00	3.738E+02	1.070E+02
	PART.		1.445E-01	8.805E+01	6.004E+01
	ELEM.	3.681E+02	3.681E+02	3.555E+04	1.017E+04

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 2.000E+00 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.437E+02	1.639E+04	1.175E+05
I 131	6.428E+01	5.970E+05	1.716E+05
I 131	1.763E+01	1.337E+04	1.471E+04
I 132	1.960E+02	1.381E+04	9.898E+04
I 132	7.378E+01	5.031E+05	1.447E+05
I 132	2.353E+01	1.126E+04	1.240E+04
I 133	3.184E+02	3.463E+04	2.482E+05
I 133	1.399E+02	1.261E+06	3.626E+05
I 133	3.899E+01	2.824E+04	3.108E+04
I 134	2.906E+02	8.702E+03	6.236E+04
I 134	8.424E+01	3.169E+05	9.112E+04
I 134	3.366E+01	7.096E+03	7.810E+03
I 135	2.815E+02	2.733E+04	1.959E+05
I 135	1.186E+02	9.954E+05	2.862E+05
I 135	3.429E+01	2.229E+04	2.453E+04
KR 83M	7.530E+02	4.725E+06	1.358E+06
KR 85M	2.861E+03	2.268E+07	6.520E+06
KR 85	1.055E+02	9.834E+05	2.828E+05
KR 87	3.652E+03	1.875E+07	5.392E+06
KR 88	6.493E+03	4.676E+07	1.345E+07
KR 89	3.916E+02	4.254E-04	1.223E-04
XE 131M	6.659E+01	6.191E+05	1.780E+05
XE 133M	3.516E+02	3.236E+06	9.303E+05
XE 133	1.438E+04	1.333E+08	3.833E+07
XE 135M	7.481E+02	1.812E+05	5.209E+04
XE 135	1.281E+04	1.106E+08	3.180E+07
XE 137	6.157E+02	6.742E-02	1.938E-02
XE 138	2.491E+03	8.583E+05	2.468E+05

CONTROL ROOM ACTIVITIES AT END OF... 2.000E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	5.318E-05	2.175E-02	6.623E-04
I 131	6.797E-05	9.757E-03	2.698E-04
I 131	7.842E-06	2.671E-03	9.051E-05
I 132	5.356E-05	2.131E-02	6.892E-04
I 132	6.226E-05	9.757E-03	2.665E-04
I 132	7.857E-06	2.644E-03	8.365E-05
I 133	1.143E-04	4.663E-02	1.428E-03
I 133	1.447E-04	2.096E-02	5.786E-04
I 133	1.684E-05	5.730E-03	1.736E-04
I 134	4.784E-05	1.809E-02	6.504E-04
I 134	4.723E-05	8.575E-03	2.305E-04
I 134	6.966E-06	2.294E-03	7.870E-05
I 135	9.398E-05	3.810E-02	1.184E-03
I 135	1.164E-04	1.721E-02	4.736E-04
I 135	1.383E-05	4.694E-03	1.438E-04
KR 83M	5.223E-02	0.000E+00	0.000E+00
KR 85M	2.436E-01	0.000E+00	0.000E+00
KR 85	1.042E-02	0.000E+00	0.000E+00
KR 87	2.140E-01	0.000E+00	0.000E+00
KR 88	5.077E-01	0.000E+00	0.000E+00
KR 89	1.579E-06	0.000E+00	0.000E+00
XE 131M	6.563E-03	0.000E+00	0.000E+00

XE 133M	3.432E-02	0.000E+00	0.000E+00
XE 133	1.414E+00	0.000E+00	0.000E+00
XE 135M	5.583E-03	0.000E+00	0.000E+00
XE 135	1.179E+00	0.000E+00	0.000E+00
XE 137	1.211E-05	0.000E+00	0.000E+00
XE 138	2.276E-02	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 2.000E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 7
CASE NUMBER 1

STEP START TIME AT 1.980E+00 (HRS) STEP END TIME AT 2.000E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	3.485E+00	5.012E-01	5.339E-02	4.478E-01
		ORG.		2.878E+00	2.235E+00	6.427E-01
		PART.		1.053E-01	4.949E-02	5.585E-02
		ELEM.	9.652E+01	9.652E+01	7.496E+01	2.155E+01
SKIN-B	HALOGENS	ELEM.	1.871E+00	2.691E-01	2.867E-02	2.405E-01
		ORG.		1.545E+00	1.200E+00	3.451E-01
		PART.		5.657E-02	2.658E-02	2.999E-02
		ELEM.	9.813E+01	9.813E+01	7.622E+01	2.191E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.438E+01	1.532E+00	1.285E+01
		ORG.		8.259E+01	6.415E+01	1.844E+01
		PART.		3.023E+00	1.420E+00	1.603E+00
SKIN-G	HALOGENS	ELEM.	3.547E+00	5.102E-01	5.435E-02	4.558E-01
		ORG.		2.930E+00	2.275E+00	6.543E-01
		PART.		1.072E-01	5.038E-02	5.685E-02
		ELEM.	9.645E+01	9.645E+01	7.491E+01	2.154E+01
SKIN-T	HALOGENS	ELEM.	2.930E+00	4.214E-01	4.489E-02	3.765E-01
		ORG.		2.420E+00	1.879E+00	5.403E-01
		PART.		9.856E-02	4.161E-02	4.696E-02
		ELEM.	9.707E+01	9.707E+01	7.539E+01	2.168E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.713E-02	2.838E+00	2.886E-02	4.287E+00
SKIN-B	1.398E-02	2.479E+00	1.912E-02	3.077E+00
THYROID	2.690E-01	7.972E+01	5.555E+00	5.646E+02
SKIN-G	2.396E-02	3.972E+00	4.066E-02	6.035E+00
SKIN-T	3.794E-02	6.451E+00	5.978E-02	9.113E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	8.169E-04	1.354E-01	1.376E-03	2.045E-01
SKIN-B	6.668E-04	1.182E-01	9.119E-04	1.468E-01
THYROID	1.283E-02	3.802E+00	2.649E-01	2.693E+01

SKIN-G	1.143E-03	1.894E-01	1.939E-03	2.878E-01
SKIN-T	1.809E-03	3.077E-01	2.851E-03	4.346E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	5.063E-04	3.604E-02	4.337E-02	6.444E+00
SKIN-B	1.378E-02	1.004E+00	2.874E-02	4.626E+00
THYROID	4.445E-03	7.351E-01	8.350E+00	8.487E+02
SKIN-G	7.077E-04	5.035E-02	6.111E-02	9.072E+00
SKIN-T	1.449E-02	1.054E+00	8.985E-02	1.370E+01

ACTIVITIES (CI) AT END OF TIME STEP 8

CASE NUMBER 1

STEP START TIME AT 2.000E+00 (HRS) STEP END TIME AT 8.000E+00 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	3.404E+06	5.023E+05	3.901E+05	1.122E+05
	ORG.		2.885E+06	2.240E+06	6.442E+05
	PART.		1.674E+04	1.244E+04	4.306E+03
	ELEM.	2.891E+08	2.891E+08	2.245E+08	6.456E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.066E+03	1.556E+02	5.333E+02	8.526E+02
	ORG.		8.935E+02	1.068E+03	3.066E+02
	PART.		1.643E+01	9.953E+01	6.499E+01
	ELEM.	8.732E+04	8.732E+04	1.034E+05	2.967E+04

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 8.000E+00 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	1.768E+02	1.017E+05	2.925E+04
I 131	2.544E+02	5.841E+05	1.680E+05
I 131	2.090E+01	3.243E+03	1.123E+03
I 132	2.092E+02	1.468E+04	4.222E+03
I 132	1.492E+02	8.430E+04	2.424E+04
I 132	2.516E+01	4.680E+02	1.620E+02
I 133	3.825E+02	1.799E+05	5.174E+04
I 133	5.080E+02	1.033E+06	2.971E+05
I 133	4.548E+01	5.736E+03	1.986E+03
I 134	2.942E+02	4.484E+02	1.290E+02
I 134	1.053E+02	2.575E+03	7.405E+02
I 134	3.423E+01	1.430E+01	4.949E+00
I 135	3.232E+02	9.335E+04	2.685E+04
I 135	3.575E+02	5.361E+05	1.542E+05
I 135	3.876E+01	2.976E+03	1.030E+03
KR 83M	1.360E+03	5.050E+05	1.452E+05
KR 85M	7.578E+03	8.792E+06	2.528E+06
KR 85	4.220E+02	9.831E+05	2.827E+05
KR 87	5.423E+03	7.047E+05	2.026E+05
KR 88	1.433E+04	1.059E+07	3.045E+06
KR 89	3.916E+02	0.000E+00	0.000E+00
XE 131M	2.644E+02	6.101E+05	1.754E+05
XE 133M	1.355E+03	3.000E+06	8.627E+05
XE 133	5.659E+04	1.290E+08	3.709E+07
XE 135M	7.517E+02	2.071E-02	5.956E-03

XE 135	4.145E+04	7.037E+07	2.024E+07
XE 137	6.157E+02	1.128E-29	3.243E-30
XE 138	2.510E+03	3.617E-01	1.040E-01

CONTROL ROOM ACTIVITIES AT END OF... 8.000E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	6.909E-06	2.426E-02	7.482E-04
I 131	3.968E-05	2.659E-02	8.305E-04
I 131	6.819E-07	2.307E-03	8.875E-05
I 132	2.490E-06	4.749E-03	1.518E-04
I 132	1.430E-05	8.399E-03	2.492E-04
I 132	3.091E-07	5.894E-04	1.855E-05
I 133	1.324E-05	4.395E-02	1.362E-03
I 133	7.605E-05	5.016E-02	1.560E-03
I 133	1.341E-06	5.277E-03	1.618E-04
I 134	5.990E-07	4.752E-04	1.405E-05
I 134	3.440E-06	1.954E-03	5.110E-05
I 134	9.395E-08	7.012E-05	2.011E-06
I 135	8.396E-06	2.425E-02	7.594E-04
I 135	4.821E-05	3.068E-02	9.440E-04
I 135	9.018E-07	2.929E-03	9.065E-05
KR 83M	1.085E-02	0.000E+00	0.000E+00
KR 85M	1.114E-01	0.000E+00	0.000E+00
KR 85	9.600E-03	0.000E+00	0.000E+00
KR 87	2.625E-02	0.000E+00	0.000E+00
KR 88	1.635E-01	0.000E+00	0.000E+00
KR 89	1.998E-15	0.000E+00	0.000E+00
XE 131M	5.976E-03	0.000E+00	0.000E+00
XE 133M	2.978E-02	0.000E+00	0.000E+00
XE 133	1.268E+00	0.000E+00	0.000E+00
XE 135M	1.784E-05	0.000E+00	0.000E+00
XE 135	7.670E-01	0.000E+00	0.000E+00
XE 137	4.719E-13	0.000E+00	0.000E+00
XE 138	9.879E-05	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 8.000E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 8
CASE NUMBER 1

STEP START TIME AT 2.000E+00 (HRS) STEP END TIME AT 8.000E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	3.767E+00	5.496E-01	3.898E-01	1.599E-01
		ORG.		3.156E-00	2.451E-00	7.049E-01
		PART.		6.131E-02	4.250E-02	1.881E-02
		ELEM.	9.623E+01	9.623E-01	7.474E+01	2.149E+01
SKIN-B	HALOGENS	ELEM.	2.162E+00	3.156E-01	2.258E-01	8.982E-02
		ORG.		1.812E+00	1.408E+00	4.048E-01
		PART.		3.406E-02	2.371E-02	1.034E-02
		ELEM.	9.784E+01	9.784E-01	7.599E+01	2.185E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.462E-01	1.066E-01	3.954E+00
		ORG.		8.393E+01	6.518E+01	1.874E+01
		PART.		1.455E+00	1.025E+00	4.307E-01

SKIN-G	HALOGENS	ELEM.	3.818E+00	5.571E-01	3.950E-01	1.620E-01
		ORG.		3.199E+00	2.484E+00	7.144E-01
		PART.		6.214E-02	4.307E-02	1.907E-02
		ELEM.	9.618E+01	9.618E+01	7.470E+01	2.148E+01
SKIN-T	HALOGENS	ELEM.	3.189E+00	4.654E-01	3.308E-01	1.346E-01
		ORG.		2.673E+00	2.076E+00	5.969E-01
		PART.		5.148E-02	3.572E-02	1.576E-02
		ELEM.	9.681E+01	9.681E+01	7.519E+01	2.162E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	2.838E+00	0.000E+00	4.287E+00
SKIN-B	0.000E+00	2.479E+00	0.000E+00	3.077E+00
THYROID	0.000E+00	7.972E+01	0.000E+00	5.646E+02
SKIN-G	0.000E+00	3.972E+00	0.000E+00	6.035E+00
SKIN-T	0.000E+00	6.451E+00	0.000E+00	9.113E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.366E-01	2.720E-01	2.392E-01	4.437E-01
SKIN-B	1.174E-01	2.357E-01	1.681E-01	3.149E-01
THYROID	3.630E+00	7.432E+00	7.617E+01	1.031E+02
SKIN-G	1.919E-01	3.813E-01	3.380E-01	6.259E-01
SKIN-T	3.093E-01	6.170E-01	5.061E-01	9.407E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	7.219E-02	1.082E-01	4.445E+00	1.089E+01
SKIN-B	2.078E+00	3.082E+00	3.123E+00	7.749E+00
THYROID	4.664E-01	1.201E+00	1.415E+03	2.264E+03
SKIN-G	1.014E-01	1.518E-01	6.280E+00	1.535E+01
SKIN-T	2.180E+00	3.234E+00	9.404E+00	2.310E+01

ACTIVITIES (CI) AT END OF TIME STEP 9

CASE NUMBER 1

STEP START TIME AT 8.000E+00 (HRS) STEP END TIME AT 2.400E+01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.908E+06	2.829E+05	2.198E+05	6.319E+04
	ORG.		1.625E+06	1.262E+06	3.629E+05
	PART.		6.109E+01	4.538E+01	1.571E+01
	ELEM.	1.855E+08	1.855E+08	1.441E+08	4.143E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.664E+03	2.465E+02	7.247E+02	9.077E+02
	ORG.		1.416E+03	2.167E+03	6.227E+02

PART.	1.930E+00	1.010E+02	6.549E+01
ELEM.	1.499E+05	1.499E+05	2.198E+05	6.315E+04

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 2.400E+01 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	2.616E+02	9.598E+04	2.760E+04
I 131	7.415E+02	5.512E+05	1.585E+05
I 131	2.147E+01	1.982E+01	6.861E+00
I 132	2.118E+02	1.253E+02	3.603E+01
I 132	1.643E+02	7.195E+02	2.069E+02
I 132	2.820E+01	2.587E-02	8.957E-03
I 133	5.023E+02	1.057E+05	3.040E+04
I 133	1.196E+03	6.072E+05	1.746E+05
I 133	4.640E+01	2.183E+01	7.558E+00
I 134	2.943E+02	1.197E-03	3.441E-04
I 134	1.054E+02	6.872E-03	1.976E-03
I 134	3.423E+01	2.471E-07	8.555E-08
I 135	3.624E+02	1.792E+04	5.154E+03
I 135	5.828E+02	1.029E+05	2.960E+04
I 135	3.915E+01	3.701E+00	1.281E+00
KR 83M	1.433E+03	1.300E+03	3.739E+02
KR 85M	1.033E+04	7.029E+05	2.021E+05
KR 85	1.266E+03	9.823E+05	2.825E+05
KR 87	5.492E+03	1.117E+02	3.211E+01
KR 88	1.659E+04	2.017E+05	5.801E+04
KR 89	3.916E+02	0.000E+00	0.000E+00
XE 131M	7.780E+02	5.867E+05	1.687E+05
XE 133M	3.687E+03	2.452E+06	7.051E+05
XE 133	1.625E+05	1.181E+08	3.395E+07
XE 135M	7.517E+02	6.376E-21	1.834E-21
XE 135	7.654E+04	2.107E+07	6.060E+06
XE 137	6.157E+02	0.000E+00	0.000E+00
XE 138	2.510E+03	3.611E-18	1.038E-18

CONTROL ROOM ACTIVITIES AT END OF... 2.400E+01 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	2.951E-06	2.628E-02	8.186E-04
I 131	1.695E-05	4.451E-02	1.428E-03
I 131	1.974E-08	2.767E-03	8.455E-05
I 132	8.283E-08	1.450E-04	4.445E-06
I 132	4.756E-07	6.717E-04	2.021E-05
I 132	1.353E-09	6.740E-06	2.098E-07
I 133	4.125E-06	3.062E-02	9.577E-04
I 133	2.369E-05	5.690E-02	1.918E-03
I 133	3.170E-08	3.140E-03	9.635E-05
I 134	8.178E-10	1.196E-06	3.112E-09
I 134	4.696E-09	6.866E-06	1.786E-07
I 134	1.957E-11	2.878E-08	7.493E-10
I 135	1.320E-06	6.222E-03	1.960E-04
I 135	7.578E-06	1.487E-02	4.694E-04
I 135	1.341E-08	5.786E-04	1.792E-05
KR 83M	2.118E-04	0.000E+00	0.000E+00
KR 85M	1.059E-02	0.000E+00	0.000E+00
KR 85	4.248E-03	0.000E+00	0.000E+00
KR 87	1.687E-04	0.000E+00	0.000E+00
KR 88	7.654E-03	0.000E+00	0.000E+00
XE 131M	2.575E-03	0.000E+00	0.000E+00
XE 133M	1.146E-02	0.000E+00	0.000E+00
XE 133	5.280E-01	0.000E+00	0.000E+00
XE 135M	3.399E-13	0.000E+00	0.000E+00
XE 135	1.542E-01	0.000E+00	0.000E+00
XE 137	1.316E-41	0.000E+00	0.000E+00
XE 138	6.939E-12	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 2.400E+01 HOURS

ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 9
CASE NUMBER 1

STEP START TIME AT 8.000E+00 (HRS) STEP END TIME AT 2.400E+01 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	6.340E+00	9.390E-01	7.293E-01	2.097E-01
		ORG.		5.392E+00	4.188E+00	1.204E+00
		PART.		8.205E-03	6.095E-03	2.110E-03
		ELEM.	9.366E+01	9.366E+01	7.274E+01	2.092E+01
SKIN-B	HALOGENS	ELEM.	2.952E+00	4.373E-01	3.396E-01	9.766E-02
		ORG.		2.511E+00	1.950E+00	5.608E-01
		PART.		3.560E-03	2.645E-03	9.156E-04
		ELEM.	9.705E+01	9.705E+01	7.537E+01	2.168E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.482E+01	1.151E+01	3.309E+00
		ORG.		8.508E+01	6.608E+01	1.900E+01
		PART.		1.024E-01	7.608E-02	2.634E-02
SKIN-G	HALOGENS	ELEM.	6.276E+00	9.297E-01	7.220E-01	2.076E-01
		ORG.		5.339E+00	4.146E+00	1.192E+00
		PART.		8.117E-03	6.029E-03	2.087E-03
		ELEM.	9.372E+01	9.372E+01	7.279E+01	2.093E+01
SKIN-T	HALOGENS	ELEM.	4.664E+00	6.909E-01	5.366E-01	1.543E-01
		ORG.		3.968E+00	3.081E+00	8.861E-01
		PART.		5.907E-03	4.388E-03	1.519E-03
		ELEM.	9.534E+01	9.534E+01	7.404E+01	2.129E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	2.838E+00	0.000E+00	4.287E+00
SKIN-B	0.000E+00	2.479E+00	0.000E+00	3.077E+00
THYROID	0.000E+00	7.972E+01	0.000E+00	5.646E+02
SKIN-G	0.000E+00	3.972E+00	0.000E+00	6.035E+00
SKIN-T	0.000E+00	6.451E+00	0.000E+00	9.113E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.011E-02	2.821E-01	2.310E-02	4.668E-01
SKIN-B	1.370E-02	2.494E-01	2.190E-02	3.368E-01
THYROID	4.937E-01	7.926E+00	1.050E+01	1.136E+02
SKIN-G	1.456E-02	3.959E-01	3.307E-02	6.589E-01
SKIN-T	2.826E-02	6.452E-01	5.497E-02	9.957E-01

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.

WHOLEBDY	2.047E-02	1.287E-01	1.642E+00	1.253E+01
SKIN-B	9.698E-01	4.052E+00	1.557E+00	9.306E+00
THYROID	4.799E-01	1.681E+00	1.481E+03	3.745E+03
SKIN-G	2.958E-02	1.813E-01	2.352E+00	1.770E+01
SKIN-T	9.994E-01	4.233E+00	3.909E+00	2.701E+01

ACTIVITIES (CI) AT END OF TIME STEP 10

CASE NUMBER 1

STEP START TIME AT 2.400E+01 (HRS) STEP END TIME AT 9.600E+01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	7.267E+05	1.078E+05	8.371E+04	2.407E+04
	ORG.		6.189E+05	4.807E+05	1.382E+05
	PART.		3.297E-09	2.449E-09	8.478E-10
	ELEM.	1.056E+08	1.056E+08	8.201E+07	2.358E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	1.655E+03	2.455E+02	9.154E+02	9.625E+02
	ORG.		1.410E+03	3.262E+03	9.376E+02
	PART.		3.753E-03	1.010E+02	6.549E+01
	ELEM.	2.019E+05	2.019E+05	3.766E+05	1.083E+05

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 9.600E+01 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	4.248E+02	7.402E+04	2.129E-04
I 131	1.679E+03	4.251E+05	1.222E-05
I 131	2.147E+01	2.165E-09	7.496E-10
I 132	2.118E+02	6.151E-08	1.769E-08
I 132	1.644E+02	3.532E-07	1.016E-07
I 132	2.520E+01	1.799E-21	6.229E-22
I 133	5.799E+02	9.678E+03	2.783E-03
I 133	1.641E+03	5.557E+04	1.598E-04
I 133	4.640E+01	2.831E-10	9.801E-11
I 134	2.943E+02	9.930E-29	2.856E-29
I 134	1.054E+02	5.702E-28	1.640E-28
I 134	3.423E+01	0.000E+00	0.000E-00
I 135	3.670E+02	1.068E+01	3.073E-00
I 135	6.096E+02	6.136E+01	1.764E-01
I 135	3.915E+01	3.126E-13	1.082E-13
KR 83M	1.433E+03	2.900E-09	8.340E-10
KR 85M	1.045E+04	8.130E+00	2.338E-00
KR 85	3.161E+03	9.803E+05	2.819E-05
KR 87	5.492E+03	8.871E-16	2.551E-16
KR 88	1.661E+04	3.673E-03	1.056E-03
KR 89	3.916E+02	0.000E+00	0.000E-00
XE 131M	1.818E+03	4.927E+05	1.417E-05
XE 133M	6.801E+03	9.908E+05	2.849E-05
XE 133	3.508E+05	7.946E+07	2.285E-07
XE 135M	7.517E+02	0.000E+00	0.000E-00
XE 135	8.401E+04	9.293E+04	2.672E-04
XE 137	6.157E+02	0.000E+00	0.000E-00
XE 138	2.510E+03	0.000E+00	0.000E-00

CONTROL ROOM ACTIVITIES AT END OF... 9.600E+01 HOURS
ALL ACTIVITIES IN CI

ISOTOPE	AIRBORNE	INTAKE FILTER	RECIRC FILTER

NAME			
I 131	8.282E-07	2.457E-02	7.739E-04
I 131	4.756E-06	5.888E-02	1.917E-03
I 131	8.853E-12	2.137E-03	6.531E-05
I 132	5.199E-11	2.951E-07	8.892E-09
I 132	2.986E-10	1.695E-06	5.107E-08
I 132	5.455E-15	3.096E-11	9.330E-13
I 133	3.896E-07	4.835E-03	1.544E-04
I 133	2.238E-06	1.686E-02	5.493E-04
I 133	8.833E-12	2.879E-04	9.834E-06
I 134	1.591E-16	1.046E-12	1.722E-14
I 134	9.138E-16	6.008E-12	1.563E-13
I 134	2.467E-20	1.622E-16	4.220E-18
I 135	2.285E-08	1.255E-04	4.026E-06
I 135	1.312E-07	7.083E-04	2.273E-05
I 135	1.218E-12	3.519E-07	1.091E-08
KR 83M	3.985E-08	0.000E+00	0.000E+00
KR 85M	6.710E-05	0.000E+00	0.000E+00
KR 85	1.392E-03	0.000E+00	0.000E+00
KR 87	1.949E-09	0.000E+00	0.000E+00
KR 88	1.084E-05	0.000E+00	0.000E+00
XE 131M	7.598E-04	0.000E+00	0.000E+00
XE 133M	2.232E-03	0.000E+00	0.000E+00
XE 133	1.368E-01	0.000E+00	0.000E+00
XE 135M	7.630E-33	0.000E+00	0.000E+00
XE 135	4.785E-03	0.000E+00	0.000E+00
XE 138	5.051E-30	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 9.600E+01 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 10
CASE NUMBER 1

STEP START TIME AT 2.400E+01 (HRS) STEP END TIME AT 9.600E+01 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	RBSPRAY	UNSPRAY
WHOLEBDY	HALOGENS	ELEM.	8.704E+00	1.291E+00	1.003E+00	2.883E-01
		ORG.		7.413E+00	5.757E+00	1.656E+00
		PART.		2.380E-05	1.768E-05	6.120E-06
		ELEM.	9.130E+01	9.130E+01	7.091E+01	2.039E+01
SKIN-B	HALOGENS	ELEM.	3.209E+00	4.759E-01	3.696E-01	1.063E-01
		ORG.		2.733E+00	2.123E+00	6.104E-01
		PART.		8.901E-06	6.612E-06	2.289E-06
		ELEM.	9.679E+01	9.679E+01	7.517E+01	2.162E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.483E+01	1.152E+01	3.312E+00
		ORG.		8.517E+01	6.615E+01	1.902E+01
		PART.		1.718E-04	1.276E-04	4.418E-05
SKIN-G	HALOGENS	ELEM.	8.070E+00	1.197E+00	9.295E-01	2.673E-01
		ORG.		6.873E+00	5.338E+00	1.535E+00
		PART.		2.207E-05	1.639E-05	5.676E-06
		ELEM.	9.193E+01	9.193E+01	7.140E+01	2.053E+01
SKIN-T	HALOGENS	ELEM.	5.373E+00	7.969E-01	6.189E-01	1.780E-01
		ORG.		4.576E+00	3.554E+00	1.022E+00
		PART.		1.476E-05	1.097E-05	3.797E-06

ELEM. 9.463E+01 9.463E+01 7.349E+01 2.113E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	2.838E+00	0.000E+00	4.287E+00
SKIN-B	0.000E+00	2.479E+00	0.000E+00	3.077E+00
THYROID	0.000E+00	7.972E+01	0.000E+00	5.646E+02
SKIN-G	0.000E+00	3.972E+00	0.000E+00	6.035E+00
SKIN-T	0.000E+00	6.451E+00	0.000E+00	9.113E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.093E-03	2.852E-01	8.559E-03	4.754E-01
SKIN-B	5.937E-03	2.553E-01	9.807E-03	3.466E-01
THYROID	6.968E-01	8.623E+00	1.484E+01	1.284E+02
SKIN-G	4.763E-03	4.006E-01	1.257E-02	6.715E-01
SKIN-T	1.070E-02	6.559E-01	2.238E-02	1.018E+00

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.646E-03	1.324E-01	6.252E-01	1.316E+01
SKIN-B	2.434E-01	4.295E+00	7.163E-01	1.002E+01
THYROID	3.154E-01	1.997E+00	1.622E+03	5.366E+03
SKIN-G	5.670E-03	1.870E-01	9.182E-01	1.862E+01
SKIN-T	2.491E-01	4.482E+00	1.635E+00	2.864E+01

ACTIVITIES (CI) AT END OF TIME STEP 11

CASE NUMBER 1

STEP START TIME AT 9.600E+01 (HRS) STEP END TIME AT 7.200E+02 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	6.764E+04	1.003E+04	7.792E+03	2.241E+03
	ORG.		5.761E+04	4.474E+04	1.287E+04
	ELEM.	4.687E+06	4.687E+06	3.640E+06	1.047E+06

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	RBSPRAY	UNSPRAY
HALOGENS	ELEM.	3.373E+03	5.002E+02	1.304E+03	1.074E+03
	ORG.		2.873E+03	5.493E+03	1.579E+03
	PART.		2.135E-13	1.010E+02	6.549E+01
	ELEM.	3.977E+05	3.977E+05	6.855E+05	1.971E+05

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 7.200E+02 (HRS)

ISO NAM	ENV.	RBSPRAY	UNSPRAY
I 131	9.173E+02	7.792E-03	2.241E+03
I 131	4.507E+03	4.474E+04	1.287E+04
I 131	2.147E+01	0.000E+00	0.000E+00
I 132	2.118E+02	0.000E+00	0.000E+00

I 132	1.644E+02	0.000E+00	0.000E+00
I 132	2.520E+01	0.000E+00	0.000E+00
I 133	5.877E+02	9.684E-06	2.785E-06
I 133	1.686E+03	5.561E-05	1.599E-05
I 133	4.640E+01	0.000E+00	0.000E+00
I 134	2.943E+02	0.000E+00	0.000E+00
I 134	1.054E+02	0.000E+00	0.000E+00
I 134	3.423E+01	0.000E+00	0.000E+00
I 135	3.670E+02	1.208E-27	3.473E-28
I 135	6.096E+02	6.935E-27	1.994E-27
I 135	3.915E+01	0.000E+00	0.000E+00
KR 83M	1.433E+03	0.000E+00	0.000E+00
KR 85M	1.045E+04	0.000E+00	0.000E+00
KR 85	1.943E+04	9.632E+05	2.770E+05
KR 87	5.492E+03	0.000E+00	0.000E+00
KR 88	1.661E+04	0.000E+00	0.000E+00
KR 89	3.916E+02	0.000E+00	0.000E+00
XE 131M	6.067E+03	1.084E+05	3.119E+04
XE 133M	8.912E+03	3.850E+02	1.107E+02
XE 133	7.258E+05	2.568E+06	7.385E+05
XE 135M	7.517E+02	0.000E+00	0.000E+00
XE 135	8.404E+04	3.573E-16	1.027E-16
XE 137	6.157E+02	0.000E+00	0.000E+00
XE 138	2.510E+03	0.000E+00	0.000E+00

CONTROL ROOM ACTIVITIES AT END OF... 7.200E+02 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	1.145E-07	1.220E-02	4.005E-04
I 131	1.232E-06	6.128E-02	2.030E-03
I 131	8.304E-23	2.279E-04	6.964E-06
I 132	3.191E-21	1.078E-16	3.248E-18
I 132	1.258E-20	6.190E-16	1.865E-17
I 132	3.257E-35	1.602E-30	4.827E-32
I 133	3.370E-09	1.520E-04	4.996E-06
I 133	1.935E-08	8.731E-04	2.869E-05
I 133	9.833E-24	2.918E-13	8.956E-15
I 134	1.134E-42	6.459E-38	1.680E-39
I 134	6.510E-42	3.709E-37	9.650E-39
I 135	1.170E-12	5.406E-08	1.735E-09
I 135	6.721E-12	3.104E-07	9.962E-09
I 135	8.829E-27	4.078E-22	1.309E-23
KR 83M	7.632E-21	0.000E+00	0.000E+00
KR 85M	6.663E-11	0.000E+00	0.000E+00
KR 85	1.025E-03	0.000E+00	0.000E+00
KR 87	1.330E-27	0.000E+00	0.000E+00
KR 88	1.694E-14	0.000E+00	0.000E+00
XE 131M	1.666E-04	0.000E+00	0.000E+00
XE 133M	1.199E-04	0.000E+00	0.000E+00
XE 133	2.339E-02	0.000E+00	0.000E+00
XE 135	1.820E-06	0.000E+00	0.000E+00

INTEGRATED FILTER ACTIVITIES AT END OF... 7.200E+02 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 11
CASE NUMBER 1

STEP START TIME AT 9.600E+01 (HRS) STEP END TIME AT 7.200E+02 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN GROUP FORM BY FORM BY GROUP RBSPRAY UNSPRAY

WHOLEBDY	HALOGENS	ELEM.	9.192E+00	1.363E+00	1.059E+00	3.045E-01
		ORG.		7.829E+00	6.080E+00	1.749E+00
		PART.		6.150E-16	4.569E-16	1.582E-16
		ELEM.	9.081E+01	9.081E+01	7.053E-01	2.028E+01
SKIN-B	HALOGENS	ELEM.	2.297E+00	3.407E-01	2.646E-01	7.610E-02
		ORG.		1.957E+00	1.520E-00	4.370E-01
		PART.		1.699E-16	1.262E-16	4.368E-17
		ELEM.	9.770E+01	9.770E+01	7.588E+01	2.182E+01
THYROID	HALOGENS	ELEM.	1.000E+02	1.483E+01	1.152E+01	3.312E+00
		ORG.		8.517E+01	6.615E+01	1.902E+01
		PART.		5.839E-15	4.338E-15	1.502E-15
SKIN-G	HALOGENS	ELEM.	8.295E+00	1.230E+00	9.555E-01	2.748E-01
		ORG.		7.065E+00	5.487E+00	1.578E+00
		PART.		5.559E-16	4.129E-16	1.429E-16
		ELEM.	9.170E+01	9.170E+01	7.122E+01	2.048E+01
SKIN-T	HALOGENS	ELEM.	4.774E+00	7.081E-01	5.499E-01	1.581E-01
		ORG.		4.066E+00	3.158E+00	9.082E-01
		PART.		3.293E-16	2.446E-16	8.468E-17
		ELEM.	9.523E+01	9.523E+01	7.396E+01	2.127E+01

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	2.838E+00	0.000E+00	4.287E+00
SKIN-B	0.000E+00	2.479E+00	0.000E+00	3.077E+00
THYROID	0.000E+00	7.972E+01	0.000E+00	5.646E+02
SKIN-G	0.000E+00	3.972E+00	0.000E+00	6.035E+00
SKIN-T	0.000E+00	6.451E+00	0.000E+00	9.113E+00

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	2.900E-03	2.881E-01	8.313E-03	4.837E-01
SKIN-B	6.498E-03	2.618E-01	9.531E-03	3.561E-01
THYROID	1.189E+00	9.812E+00	2.534E+01	1.538E+02
SKIN-G	4.571E-03	4.052E-01	1.227E-02	6.838E-01
SKIN-T	1.107E-02	6.670E-01	2.180E-02	1.040E+00

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	2.852E-03	1.352E-01	7.422E-01	1.390E+01
SKIN-B	2.248E-01	4.520E+00	8.510E-01	1.087E+01
THYROID	4.390E-01	2.436E+00	3.383E+03	8.750E+03
SKIN-G	4.541E-03	1.916E-01	1.096E+00	1.972E+01
SKIN-T	2.293E-01	4.712E+00	1.947E+00	3.059E+01

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START EXCLUSION RADIUS LOW POPULATION ZONE CONTROL ROOM

TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.004E-01	1.004E-01
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	1.624E-02	1.167E-01
1.750E-02	1.277E+00	1.354E+00	6.089E-02	6.459E-02	1.919E+00	2.036E+00
4.300E-01	2.717E+00	4.072E+00	1.296E-01	1.942E-01	4.084E+00	6.120E+00
1.853E+00	1.868E-01	4.259E+00	8.911E-03	2.031E-01	2.808E-01	6.401E+00
1.980E+00	2.886E-02	4.287E+00	1.376E-03	2.045E-01	4.337E-02	6.444E+00
2.000E+00	0.000E+00	4.287E+00	2.392E-01	4.437E-01	4.445E+00	1.089E+01
8.000E+00	0.000E+00	4.287E+00	2.310E-02	4.668E-01	1.642E+00	1.253E+01
2.400E+01	0.000E+00	4.287E+00	8.559E-03	4.754E-01	6.252E-01	1.316E+01
9.600E+01	0.000E+00	4.287E+00	8.313E-03	4.837E-01	7.422E-01	1.390E+01
	TOTAL	4.287E+00	TOTAL	4.837E-01	TOTAL	1.390E+01

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	8.456E-06	8.456E-06
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	2.998E-06	1.145E-05
1.750E-02	9.619E-01	1.039E+00	4.587E-02	4.957E-02	3.469E-03	3.481E-03
4.300E-01	1.671E+00	2.710E+00	7.969E-02	1.293E-01	2.884E-02	3.232E-02
1.853E+00	1.109E-01	2.821E+00	5.291E-03	1.346E-01	3.220E-03	3.554E-02
1.980E+00	1.713E-02	2.838E+00	8.169E-04	1.354E-01	5.063E-04	3.604E-02
2.000E+00	0.000E+00	2.838E+00	1.366E-01	2.720E-01	7.219E-02	1.082E-01
8.000E+00	0.000E+00	2.838E+00	1.011E-02	2.821E-01	2.047E-02	1.287E-01
2.400E+01	0.000E+00	2.838E+00	3.093E-03	2.852E-01	3.646E-03	1.324E-01
9.600E+01	0.000E+00	2.838E+00	2.900E-03	2.881E-01	2.852E-03	1.352E-01
	TOTAL	2.838E+00	TOTAL	2.881E-01	TOTAL	1.352E-01

PAGE 2

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	1.171E-01	1.171E-01
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.841E-02	1.355E-01
1.750E-02	1.036E+00	1.126E+00	4.942E-02	5.372E-02	1.557E+00	1.693E+00
4.300E-01	1.808E+00	2.935E+00	8.624E-02	1.400E-01	2.719E+00	4.411E+00
1.853E+00	1.238E-01	3.058E+00	5.902E-03	1.459E-01	1.860E-01	4.597E+00
1.980E+00	1.912E-02	3.077E+00	9.119E-04	1.468E-01	2.874E-02	4.626E+00
2.000E+00	0.000E+00	3.077E+00	1.681E-01	3.149E-01	3.123E+00	7.749E+00
8.000E+00	0.000E+00	3.077E+00	2.190E-02	3.368E-01	1.557E+00	9.306E+00
2.400E+01	0.000E+00	3.077E+00	9.807E-03	3.466E-01	7.163E-01	1.002E+01
9.600E+01	0.000E+00	3.077E+00	9.531E-03	3.561E-01	8.510E-01	1.087E+01
	TOTAL	3.077E+00	TOTAL	3.561E-01	TOTAL	1.087E+01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	3.953E-04	3.953E-04
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.388E-04	5.340E-04
1.750E-02	9.117E-01	1.002E+00	4.348E-02	4.778E-02	1.073E-01	1.078E-01
4.300E-01	1.373E+00	2.375E+00	6.548E-02	1.133E-01	7.944E-01	9.022E-01

1.853E+00	9.064E-02	2.465E+00	4.323E-03	1.176E-01	8.779E-02	9.900E-01
1.980E+00	1.398E-02	2.479E+00	6.668E-04	1.182E-01	1.378E-02	1.004E+00
2.000E+00	0.000E+00	2.479E+00	1.174E-01	2.357E-01	2.078E+00	3.082E+00
8.000E+00	0.000E+00	2.479E+00	1.370E-02	2.494E-01	9.698E-01	4.052E+00
2.400E+01	0.000E+00	2.479E+00	5.937E-03	2.553E-01	2.434E-01	4.295E+00
9.600E+01	0.000E+00	2.479E+00	6.498E-03	2.618E-01	2.248E-01	4.520E+00
	TOTAL	2.479E+00	TOTAL	2.618E-01	TOTAL	4.520E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	6.471E+00	6.471E+00
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.079E+00	7.550E+00
1.750E-02	1.180E+02	1.230E+02	5.628E+00	5.867E+00	1.774E+02	1.849E+02
4.300E-01	4.007E+02	5.238E+02	1.911E+01	2.498E+01	6.023E+02	7.872E+02
1.853E+00	3.532E+01	5.591E+02	1.684E+00	2.666E+01	5.308E+01	8.403E+02
1.980E+00	5.555E+00	5.646E+02	2.649E-01	2.693E+01	8.350E+00	8.487E+02
2.000E+00	0.000E+00	5.646E+02	7.617E+01	1.031E+02	1.415E+03	2.264E+03
8.000E+00	0.000E+00	5.646E+02	1.050E+01	1.136E+02	1.481E+03	3.745E+03
2.400E+01	0.000E+00	5.646E+02	1.484E+01	1.284E+02	1.622E+03	5.366E+03
9.600E+01	0.000E+00	5.646E+02	2.534E+01	1.538E+02	3.383E+03	8.750E+03
	TOTAL	5.646E+02	TOTAL	1.538E+02	TOTAL	8.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	9.558E-04	9.558E-04
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	3.423E-04	1.298E-03
1.750E-02	3.766E-01	4.268E+01	1.796E+00	2.036E+00	1.981E-01	1.994E-01
4.300E-01	3.502E+01	7.771E+01	1.670E+00	3.706E+00	5.005E-01	6.999E-01
1.853E+00	1.742E+00	7.945E+01	8.306E-02	3.789E+00	3.074E-02	7.306E-01
1.980E+00	2.690E-01	7.972E+01	1.283E-02	3.802E+00	4.445E-03	7.351E-01
2.000E+00	0.000E+00	7.972E+01	3.630E+00	7.432E+00	4.664E-01	1.201E+00
8.000E+00	0.000E+00	7.972E+01	4.937E-01	7.926E+00	4.799E-01	1.681E+00
2.400E+01	0.000E+00	7.972E+01	6.968E-01	8.623E+00	3.154E-01	1.997E+00
9.600E+01	0.000E+00	7.972E+01	1.189E+00	9.812E+00	4.390E-01	2.436E+00
	TOTAL	7.972E+01	TOTAL	9.812E+00	TOTAL	2.436E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.410E-01	1.410E-01
1.500E-02	1.517E-01	1.089E-01	7.233E-04	5.196E-03	2.280E-02	1.637E-01
1.750E-02	1.796E+00	1.905E+00	8.564E-02	9.084E-02	2.699E+00	2.863E+00
4.300E-01	3.827E+00	5.732E+00	1.825E-01	2.734E-01	5.752E+00	8.615E+00
1.853E+00	2.633E-01	5.995E+00	1.256E-02	2.859E-01	3.957E-01	9.011E+00
1.980E+00	4.066E-02	6.035E+00	1.939E-03	2.878E-01	6.111E-02	9.072E+00
2.000E+00	0.000E+00	6.035E+00	3.380E-01	6.259E-01	6.280E+00	1.535E+01

8.000E+00	0.000E+00	6.035E+00	3.307E-02	6.589E-01	2.352E+00	1.770E+01
2.400E+01	0.000E+00	6.035E+00	1.257E-02	6.715E-01	9.182E-01	1.862E+01
9.600E+01	0.000E+00	6.035E+00	1.227E-02	6.838E-01	1.096E+00	1.972E+01
	TOTAL	6.035E+00	TOTAL	6.838E-01	TOTAL	1.972E+01

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.180E-05	1.180E-05
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	4.185E-06	1.599E-05
1.750E-02	1.347E+00	1.456E+00	6.425E-02	6.945E-02	4.844E-03	4.860E-03
4.300E-01	2.336E+00	3.793E+00	1.114E-01	1.809E-01	4.028E-02	4.515E-02
1.853E+00	1.552E-01	3.948E+00	7.401E-03	1.883E-01	4.500E-03	4.965E-02
1.980E+00	2.396E-02	3.972E+00	1.143E-03	1.894E-01	7.077E-04	5.035E-02
2.000E+00	0.000E+00	3.972E+00	1.919E-01	3.813E-01	1.014E-01	1.518E-01
8.000E+00	0.000E+00	3.972E+00	1.456E-02	3.959E-01	2.958E-02	1.813E-01
2.400E+01	0.000E+00	3.972E+00	4.763E-03	4.006E-01	5.670E-03	1.870E-01
9.600E+01	0.000E+00	3.972E+00	4.571E-03	4.052E-01	4.541E-03	1.916E-01
	TOTAL	3.972E+00	TOTAL	4.052E-01	TOTAL	1.916E-01

PAGE 5

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	2.580E-01	2.580E-01
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	4.121E-02	2.992E-01
1.750E-02	2.832E+00	3.031E+00	1.351E-01	1.446E-01	4.257E+00	4.556E+00
4.300E-01	5.635E+00	8.666E+00	2.688E-01	4.133E-01	8.470E+00	1.303E+01
1.853E+00	3.870E-01	9.053E+00	1.846E-02	4.318E-01	5.817E-01	1.361E+01
1.980E+00	5.978E-02	9.113E+00	2.851E-03	4.346E-01	8.985E-02	1.370E+01
2.000E+00	0.000E+00	9.113E+00	5.061E-01	9.407E-01	9.404E+00	2.310E+01
8.000E+00	0.000E+00	9.113E+00	5.497E-02	9.957E-01	3.909E+00	2.701E+01
2.400E+01	0.000E+00	9.113E+00	2.238E-02	1.018E+00	1.635E+00	2.864E+01
9.600E+01	0.000E+00	9.113E+00	2.180E-02	1.040E+00	1.947E+00	3.059E+01
	TOTAL	9.113E+00	TOTAL	1.040E+00	TOTAL	3.059E+01

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	4.071E-04	4.071E-04
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	1.430E-04	5.500E-04
1.750E-02	2.259E+00	2.458E+00	1.077E-01	1.172E-01	1.121E-01	1.127E-01
4.300E-01	3.709E+00	6.167E+00	1.769E-01	2.941E-01	8.347E-01	9.474E-01
1.853E+00	2.458E-01	6.413E+00	1.172E-02	3.059E-01	9.229E-02	1.040E+00
1.980E+00	3.794E-02	6.451E+00	1.809E-03	3.077E-01	1.449E-02	1.054E+00
2.000E+00	0.000E+00	6.451E+00	3.093E-01	6.170E-01	2.180E+00	3.234E+00
8.000E+00	0.000E+00	6.451E+00	2.826E-02	6.452E-01	9.994E-01	4.233E+00
2.400E+01	0.000E+00	6.451E+00	1.070E-02	6.559E-01	2.491E-01	4.482E+00
9.600E+01	0.000E+00	6.451E+00	1.107E-02	6.670E-01	2.293E-01	4.712E+00
	TOTAL	6.451E+00	TOTAL	6.670E-01	TOTAL	4.712E+00

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 2

Unit 2 MHA ESF Leakage
TRANSACT Input and Output

(MHACASE4.R5, MHACASE4.RV5)

Input - MHACASE4.R5

```
'ICRP30A                                                                    '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)               '
'MHACASE4.R5  UNIT 2 MHA ESF LEAKAGE'
'                                                                           '
 0, 0, 0, 1, 1
  1,  3
'ECCS     '
 6
 3.087E+03, 1.000E+00
 0.500E+00, 0.000E+00
 0.900E+00, 0.000E+00
 1.000E+00, 1.000E+00, 0.000E+00
 0.000E+00, 1.000E+00, 0.000E+00
 6.2898E+04, 4.000E+04
'TIME INTERVAL    ',0,0,0,0,2, 0.000E+00, 0.430E+00
'INITIAL FRACTION',0,0,0,0,1, 1.000E+00
'CONTROL ROOM     ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF    ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF    ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF    ',1,3,0,0,2, 0.950E+02, 0.990E+02
'DOSE PARAMS      ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL    ',0,0,0,0,2, 0.430E+00, 2.000E+00
'TRANSFER CFM     ',0,0,0,1,1, 1.212E-03
'TIME INTERVAL    ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS      ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL    ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS      ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 2.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL    ',0,0,0,0,2, 2.400E+01, 96.00E+00
'CONTROL ROOM     ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS      ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL    ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM     ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS      ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END              ',0,0,0,0,0, 0.000E+00, 0.000E+00
```

Output - MHACASE4.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   8:51:29

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)
 MHACASE4.R5  UNIT 2 MHA ESF LEAKAGE
1                           TIME INDEPENDENT INPUT
                              CASE NUMBER   1


                                NODES  NSTEP
                                  1      6

                            OUTPUT CONTROL PARAMETER
                         I        1    2    3    4    5
                   IPRINT(I)      0    0    0    1    1

                   NUMBER OF DOSE EVALUATION POINTS -   3


                 POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          5.000E-01     0.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          9.000E-01     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         5.000E-02     0.000E+00


                            ISOTOPIC SPLIT BY GROUP
                         ELEM.          ORG.           PART.
      HALOGENS       1.000E+00      0.000E+00      0.000E+00
                     0.000E+00      0.000E+00      0.000E+00


                            VOLUME OF NODES (CU FT)
           ECCS
           6.290E+04


                            CONTROL ROOM VOLUME (CU FT)
                                      4.000E+04
```

0(3)	11/30/00	KLA	JL	Entergy Operations	CALCULATION NUMBER	
0(2)	10/10/00	JGM	MAM		91-E-0117-16	
0(1)	4/25/00	JGM	MAM	ARKANSAS NUCLEAR ONE		
0	8/26/99	JGM	MAM		PAGE NUMBER	Attachment 2
REV.	DATE	BY	CHK'D			3 OF 15

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.5080000E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.8060000E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.6220000E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	6.5750000E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	5.1030000E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   4.30000E-01
INITIAL FRACTION       0    0    0    0    1   1.00000E+00
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
DOSE PARAMS            0    0    0    0    7   6.50000E-04   3.47000E-04
 3.10000E-05   3.47000E-04   9.77000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   4.30000E-01   2.00000E+00
TRANSFER CFM           0    0    0    1    1   1.21200E-03
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

ACTIVITIES (CI) AT END OF TIME STEP 1

CASE NUMBER 1

STEP START TIME AT 0.000E+00 (HRS) STEP END TIME AT 4.300E-01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	3.231E+07	3.231E+07	3.231E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 4.300E-01 (HRS)

ISO NAM	ENV.	ECCS
I 131	0.000E+00	3.865E+06

```
I  132    0.000E+00 5.169E+06
I  133    0.000E+00 8.555E+06
I  134    0.000E+00 7.188E+06
I  135    0.000E+00 7.535E+06

          CONTROL ROOM ACTIVITIES AT END OF... 4.300E-01   HOURS
          ALL ACTIVITIES IN CI

               ISOTOPE     AIRBORNE     INTAKE FILTER     RECIRC FILTER
               NAME


INTEGRATED FILTER ACTIVITIES AT END OF... 4.300E-01   HOURS
          ALL ACTIVITIES IN CI


                              EXCLUSION BOUNDARY
 ORGAN            CALCULATED                UNREDUCED
 NAME             DOSE (REM)                DOSE (REM)
            FOR THIS   ACCUM.       FOR THIS   ACCUM.
            TIME STEP               TIME STEP
 WHOLEBDY  0.000E+00 0.000E+00    9.788E-02 9.788E-02
  SKIN-B   0.000E+00 0.000E+00    3.862E-02 3.862E-02
  THYROID  0.000E+00 0.000E+00    2.461E+01 2.461E+01
   SKIN-G  0.000E+00 0.000E+00    1.394E-01 1.394E-01
   SKIN-T  0.000E+00 0.000E+00    1.781E-01 1.781E-01

                              LOW POPULATION ZONE
 ORGAN            CALCULATED                UNREDUCED
 NAME             DOSE (REM)                DOSE (REM)
            FOR THIS   ACCUM.       FOR THIS   ACCUM.
            TIME STEP               TIME STEP
 WHOLEBDY  0.000E+00 0.000E+00    4.668E-03 4.668E-03
  SKIN-B   0.000E+00 0.000E+00    1.842E-03 1.842E-03
  THYROID  0.000E+00 0.000E+00    1.173E+00 1.173E+00
   SKIN-G  0.000E+00 0.000E+00    6.650E-03 6.650E-03
   SKIN-T  0.000E+00 0.000E+00    8.492E-03 8.492E-03

                                 CONTROL ROOM DOSES
 ORGAN            CALCULATED                UNREDUCED
 NAME             DOSE (REM)                DOSE (REM)
            FOR THIS   ACCUM.       FOR THIS   ACCUM.
            TIME STEP               TIME STEP
 WHOLEBDY  0.000E+00 0.000E+00    1.471E-01 1.471E-01
  SKIN-B   0.000E+00 0.000E+00    5.805E-02 5.805E-02
  THYROID  0.000E+00 0.000E+00    3.698E+01 3.698E+01
   SKIN-G  0.000E+00 0.000E+00    2.096E-01 2.096E-01
   SKIN-T  0.000E+00 0.000E+00    2.676E-01 2.676E-01

                     ACTIVITIES (CI) AT END OF TIME STEP  2

                                 CASE NUMBER  1

    STEP START TIME AT 4.300E-01  (HRS)    STEP END TIME AT 2.000E+00  (HRS)


                  ACTIVITY DISTRIBUTION IN THE NODES MODELED
                      BY CHEMICAL/PHYSICAL FORM AND GROUP

 GROUP      FORM   BY GROUP  BY FORM ECCS
HALOGENS    ELEM.  2.365E+07 2.365E+07 2.365E+07


        ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
                FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

 GROUP      FORM   BY GROUP  BY FORM  ECCS
HALOGENS    ELEM.  4.967E+01 4.967E+01 4.967E+01
```

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 2.000E+00 (HRS)

ISO NAM	ENV.	ECCS
I 131	6.996E+00	3.843E+06
I 132	7.495E+00	3.239E+06
I 133	1.513E+01	8.120E+06
I 134	7.420E+00	2.040E+06
I 135	1.263E+01	6.409E+06

CONTROL ROOM ACTIVITIES AT END OF... 2.000E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	9.366E-06	1.064E-03	2.853E-05
I 132	9.144E-06	1.139E-03	2.859E-05
I 133	2.006E-05	2.300E-03	6.128E-05
I 134	7.845E-06	1.128E-03	2.546E-05
I 135	1.637E-05	1.920E-03	5.032E-05

INTEGRATED FILTER ACTIVITIES AT END OF... 2.000E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 2
CASE NUMBER 1

STEP START TIME AT 4.300E-01 (HRS) STEP END TIME AT 2.000E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	ECCS
WHOLEBDY	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-B	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
THYROID	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-G	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-T	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	6.906E-03	6.906E-03	2.489E-01	3.467E-01
SKIN-B	2.881E-03	2.881E-03	1.038E-01	1.424E-01
THYROID	2.451E+00	2.451E+00	8.832E+01	1.129E+02
SKIN-G	9.835E-03	9.835E-03	3.544E-01	4.939E-01
SKIN-T	1.272E-02	1.272E-02	4.583E-01	6.363E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	3.293E-04	3.293E-04	1.187E-02	1.654E-02
SKIN-B	1.374E-04	1.374E-04	4.951E-03	6.793E-03
THYROID	1.169E-01	1.169E-01	4.212E+00	5.386E+00
SKIN-G	4.691E-04	4.691E-04	1.690E-02	2.355E-02
SKIN-T	6.065E-04	6.065E-04	2.186E-02	3.035E-02

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	1.652E-06	1.652E-06	3.741E-01	5.212E-01
SKIN-B	2.280E-05	2.280E-05	1.560E-01	2.141E-01
THYROID	2.051E-02	2.051E-02	1.328E+02	1.697E+02
SKIN-G	2.353E-06	2.353E-06	5.327E-01	7.423E-01
SKIN-T	2.516E-05	2.516E-05	6.888E-01	9.564E-01

ACTIVITIES (CI) AT END OF TIME STEP 3

CASE NUMBER 1

STEP START TIME AT 2.000E+00 (HRS) STEP END TIME AT 8.000E+00 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	1.443E+07	1.443E+07	1.443E+07

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	1.240E+02	1.240E+02	1.737E+02

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 8.000E+00 (HRS)

ISO NAM	ENV.	ECCS
I 131	3.337E+01	3.762E+06
I 132	1.797E+01	3.429E+05
I 133	6.621E+01	6.654E+06
I 134	1.034E+01	1.658E+04
I 135	4.578E+01	3.452E+06

CONTROL ROOM ACTIVITIES AT END OF... 8.000E+00 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	5.506E-06	3.405E-03	1.065E-04
I 132	1.984E-06	1.129E-03	3.319E-05
I 133	1.055E-05	6.463E-03	2.009E-04
I 134	4.773E-07	2.706E-04	7.044E-06
I 135	6.690E-06	4.005E-03	1.227E-04

INTEGRATED FILTER ACTIVITIES AT END OF... 8.000E+00 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 3
CASE NUMBER 1

STEP START TIME AT 2.000E+00 (HRS) STEP END TIME AT 8.000E+00 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN GROUP FORM BY FORM BY GROUP ECCS

WHOLEBDY	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-B	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
THYROID	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-G	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-T	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	6.906E-03	0.000E+00	3.467E-01
SKIN-B	0.000E+00	2.881E-03	0.000E+00	1.424E-01
THYROID	0.000E+00	2.451E+00	0.000E+00	1.129E+02
SKIN-G	0.000E+00	9.835E-03	0.000E+00	4.939E-01
SKIN-T	0.000E+00	1.272E-02	0.000E+00	6.363E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	5.983E-04	9.276E-04	2.156E-02	3.809E-02
SKIN-B	2.953E-04	4.327E-04	1.064E-02	1.744E-02
THYROID	4.228E-01	5.397E-01	1.523E+01	2.062E+01
SKIN-G	8.518E-04	1.321E-03	3.069E-02	5.424E-02
SKIN-T	1.147E-03	1.754E-03	4.133E-02	7.168E-02

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	2.247E-06	3.899E-06	4.005E-01	9.217E-01
SKIN-B	3.670E-05	5.951E-05	1.977E-01	4.118E-01
THYROID	5.419E-02	7.470E-02	2.831E+02	4.528E+02
SKIN-G	3.199E-06	5.552E-06	5.703E-01	1.313E+00
SKIN-T	3.990E-05	6.506E-05	7.680E-01	1.724E+00

ACTIVITIES (CI) AT END OF TIME STEP 4

CASE NUMBER 1

STEP START TIME AT 8.000E+00 (HRS) STEP END TIME AT 2.400E+01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	8.132E+06	8.132E+06	8.132E+06

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	1.965E+02	1.965E+02	3.702E+02

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 2.400E+01 (HRS)

ISO NAM ENV. ECCS

```
I  131    1.010E+02 3.552E+06
I  132    2.006E+01 4.636E+03
I  133    1.617E+02 3.913E+06
I  134    1.036E+01 4.429E-02
I  135    7.705E+01 6.632E+05

        CONTROL ROOM ACTIVITIES AT END OF... 2.400E+01   HOURS
        ALL ACTIVITIES IN CI

            ISOTOPE     AIRBORNE     INTAKE FILTER     RECIRC FILTER
            NAME

            I  131        2.353E-06      5.909E-03       1.900E-04
            I  132        6.602E-08      9.292E-05       2.793E-06
            I  133        3.289E-06      7.604E-03       2.431E-04
            I  134        6.518E-10      9.530E-07       2.479E-08
            I  135        1.052E-06      2.015E-03       6.355E-05

INTEGRATED FILTER ACTIVITIES AT END OF... 2.400E+01   HOURS
        ALL ACTIVITIES IN CI


                          DOSES FOR TIME STEP  4
                              CASE NUMBER  1

   STEP START TIME AT 8.000E+00  (HRS)    STEP END TIME AT 2.400E+01  (HRS)


                 PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
                     BY CHEMICAL/PHYSICAL FORM AND GROUP

  ORGAN     GROUP      FORM   BY FORM   BY GROUP  ECCS

 WHOLEBDY  HALOGENS    ELEM.  1.000E+02 1.000E+02 1.000E+02

  SKIN-B   HALOGENS    ELEM.  1.000E+02 1.000E+02 1.000E+02

  THYROID  HALOGENS    ELEM.  1.000E+02 1.000E+02 1.000E+02

   SKIN-G  HALOGENS    ELEM.  1.000E+02 1.000E+02 1.000E+02

   SKIN-T  HALOGENS    ELEM.  1.000E+02 1.000E+02 1.000E+02


                          EXCLUSION BOUNDARY
 ORGAN            CALCULATED              UNREDUCED
 NAME             DOSE (REM)              DOSE (REM)
            FOR THIS   ACCUM.      FOR THIS   ACCUM.
            TIME STEP              TIME STEP
 WHOLEBDY  0.000E+00 6.906E-03   0.000E+00 3.467E-01
  SKIN-B   0.000E+00 2.981E-03   0.000E+00 1.424E-01
  THYROID  0.000E+00 2.451E+00   0.000E+00 1.129E+02
   SKIN-G  0.000E+00 9.835E-03   0.000E+00 4.939E-01
   SKIN-T  0.000E+00 1.272E-02   0.000E+00 6.363E-01

                          LOW POPULATION ZONE
 ORGAN            CALCULATED              UNREDUCED
 NAME             DOSE (REM)              DOSE (REM)
            FOR THIS   ACCUM.      FOR THIS   ACCUM.
            TIME STEP              TIME STEP
 WHOLEBDY  7.567E-05 1.003E-03   2.725E-03 4.082E-02
  SKIN-B   4.776E-05 4.805E-04   1.720E-03 1.916E-02
  THYROID  5.831E-02 5.980E-01   2.100E+00 2.272E+01
   SKIN-G  1.079E-04 1.429E-03   3.886E-03 5.813E-02
   SKIN-T  1.557E-04 1.909E-03   5.606E-03 7.729E-02

                             CONTROL ROOM DOSES
 ORGAN            CALCULATED              UNREDUCED
 NAME             DOSE (REM)              DOSE (REM)
            FOR THIS   ACCUM.      FOR THIS   ACCUM.
```

	TIME STEP		TIME STEP	
WHOLEBDY	1.116E-06	5.016E-06	1.938E-01	1.116E+00
SKIN-B	2.313E-05	8.264E-05	1.223E-01	5.342E-01
THYROID	5.669E-02	1.314E-01	2.961E+02	7.489E+02
SKIN-G	1.592E-06	7.144E-06	2.763E-01	1.589E+00
SKIN-T	2.473E-05	8.978E-05	3.987E-01	2.123E+00

ACTIVITIES (CI) AT END OF TIME STEP 5

CASE NUMBER 1

STEP START TIME AT 2.400E+01 (HRS) STEP END TIME AT 9.600E+01 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	3.102E+06	3.102E+06	3.102E+06

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	3.918E+02	3.918E+02	7.620E+02

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 9.600E+01 (HRS)

ISO NAM	ENV.	ECCS
I 131	3.615E+02	2.743E+06
I 132	2.007E+01	2.279E-06
I 133	2.855E+02	3.586E+05
I 134	1.036E+01	3.680E-27
I 135	8.449E+01	3.960E+02

CONTROL ROOM ACTIVITIES AT END OF... 9.600E+01 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	1.322E-06	1.138E-02	3.729E-04
I 132	8.293E-11	4.707E-07	1.418E-08
I 133	6.218E-07	3.933E-03	1.286E-04
I 134	2.538E-16	1.669E-12	4.341E-14
I 135	3.646E-08	1.955E-04	6.273E-06

INTEGRATED FILTER ACTIVITIES AT END OF... 9.600E+01 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 5
CASE NUMBER 1

STEP START TIME AT 2.400E+01 (HRS) STEP END TIME AT 9.600E+01 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	ECCS
WHOLEBDY	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-B	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02

THYROID	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-G	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-T	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	6.906E-03	0.000E+00	3.467E-01
SKIN-B	0.000E+00	2.881E-03	0.000E+00	1.424E-01
THYROID	0.000E+00	2.451E+00	0.000E+00	1.129E+02
SKIN-G	0.000E+00	9.835E-03	0.000E+00	4.939E-01
SKIN-T	0.000E+00	1.272E-02	0.000E+00	6.363E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	6.371E-05	1.067E-03	1.147E-03	4.197E-02
SKIN-B	4.509E-05	5.256E-04	8.116E-04	1.997E-02
THYROID	1.649E-01	7.629E-01	2.969E+00	2.569E+01
SKIN-G	9.098E-05	1.520E-03	1.638E-03	5.977E-02
SKIN-T	1.361E-04	2.045E-03	2.449E-03	7.974E-02

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	5.873E-07	5.603E-06	8.377E-02	1.199E+00
SKIN-B	1.356E-05	9.620E-05	5.928E-02	5.934E-01
THYROID	7.466E-02	2.061E-01	3.244E+02	1.073E+03
SKIN-G	8.387E-07	7.983E-06	1.196E-01	1.709E+00
SKIN-T	1.440E-05	1.042E-04	1.789E-01	2.302E+00

ACTIVITIES (CI) AT END OF TIME STEP 6

CASE NUMBER 1

STEP START TIME AT 9.600E+01 (HRS) STEP END TIME AT 7.200E+02 (HRS)

ACTIVITY DISTRIBUTION IN THE NODES MODELED
BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	2.923E+05	2.923E+05	2.923E+05

ACTIVITY CONTRIBUTION TO THE ENVIRONMENT FROM EACH NODE MODELED
FOR THE PLANT BY CHEMICAL/PHYSICAL FORM AND GROUP

GROUP	FORM	BY GROUP	BY FORM	ECCS
HALOGENS	ELEM.	8.022E+02	8.022E+02	1.564E+03

ACTIVITY RELEASED TO ENVIRONMENT AND IN EACH NODE AT END OF... 7.200E+02 (HRS)

ISO NAM	ENV.	ECCS
I 131	1.151E+03	2.923E-05
I 132	2.007E+01	0.000E+00
I 133	2.980E+02	3.633E-04
I 134	1.036E+01	0.000E+00
I 135	8.449E+01	4.531E-26

CONTROL ROOM ACTIVITIES AT END OF... 7.200E+02 HOURS
ALL ACTIVITIES IN CI

ISOTOPE NAME	AIRBORNE	INTAKE FILTER	RECIRC FILTER
I 131	3.440E-07	1.657E-02	5.496E-04
I 132	3.500E-21	1.722E-16	5.188E-18
I 133	5.387E-09	2.430E-04	7.984E-06
I 134	1.810E-42	1.032E-37	2.684E-39
I 135	1.870E-12	8.636E-08	2.771E-09

INTEGRATED FILTER ACTIVITIES AT END OF... 7.200E+02 HOURS
ALL ACTIVITIES IN CI

DOSES FOR TIME STEP 6
CASE NUMBER 1

STEP START TIME AT 9.600E+01 (HRS) STEP END TIME AT 7.200E+02 (HRS)

PERCENT OF DOSE CONTRIBUTION FROM EACH NODE
BY CHEMICAL/PHYSICAL FORM AND GROUP

ORGAN	GROUP	FORM	BY FORM	BY GROUP	ECCS
WHOLEBDY	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-B	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
THYROID	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-G	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02
SKIN-T	HALOGENS	ELEM.	1.000E+02	1.000E+02	1.000E+02

EXCLUSION BOUNDARY

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	0.000E+00	6.906E-03	0.000E+00	3.467E-01
SKIN-B	0.000E+00	2.881E-03	0.000E+00	1.424E-01
THYROID	0.000E+00	2.451E+00	0.000E+00	1.129E+02
SKIN-G	0.000E+00	9.935E-03	0.000E+00	4.939E-01
SKIN-T	0.000E+00	1.272E-02	0.000E+00	6.363E-01

LOW POPULATION ZONE

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	6.339E-05	1.130E-03	1.136E-03	4.310E-02
SKIN-B	3.550E-05	5.611E-04	6.360E-04	2.060E-02
THYROID	2.829E-01	1.046E+00	5.067E+00	3.076E+01
SKIN-G	9.018E-05	1.610E-03	1.616E-03	6.138E-02
SKIN-T	1.257E-04	2.171E-03	2.252E-03	8.199E-02

CONTROL ROOM DOSES

ORGAN NAME	CALCULATED DOSE (REM) FOR THIS TIME STEP	CALCULATED DOSE (REM) ACCUM.	UNREDUCED DOSE (REM) FOR THIS TIME STEP	UNREDUCED DOSE (REM) ACCUM.
WHOLEBDY	4.791E-07	6.082E-06	1.014E-01	1.301E+00
SKIN-B	8.756E-06	1.050E-04	5.678E-02	6.502E-01
THYROID	1.044E-01	3.105E-01	6.767E+02	1.750E+03
SKIN-G	6.816E-07	8.664E-06	1.443E-01	1.853E+00

SKIN-T 9.438E-06 1.136E-04 2.010E-01 2.503E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	9.788E-02	9.788E-02	4.668E-03	4.668E-03	1.471E-01	1.471E-01
4.300E-01	2.489E-01	3.467E-01	1.187E-02	1.654E-02	3.741E-01	5.212E-01
2.000E+00	0.000E+00	3.467E-01	2.156E-02	3.809E-02	4.005E-01	9.217E-01
8.000E+00	0.000E+00	3.467E-01	2.725E-03	4.082E-02	1.938E-01	1.116E+00
2.400E+01	0.000E+00	3.467E-01	1.147E-03	4.197E-02	8.377E-02	1.199E+00
9.600E+01	0.000E+00	3.467E-01	1.136E-03	4.310E-02	1.014E-01	1.301E+00
	TOTAL	3.467E-01	TOTAL	4.310E-02	TOTAL	1.301E+00

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	6.906E-03	6.906E-03	3.293E-04	3.293E-04	1.652E-06	1.652E-06
2.000E+00	0.000E+00	6.906E-03	5.983E-04	9.276E-04	2.247E-06	3.899E-06
8.000E+00	0.000E+00	6.906E-03	7.567E-05	1.003E-03	1.116E-06	5.016E-06
2.400E+01	0.000E+00	6.906E-03	6.371E-05	1.067E-03	5.873E-07	5.603E-06
9.600E+01	0.000E+00	6.906E-03	6.339E-05	1.130E-03	4.791E-07	6.082E-06
	TOTAL	6.906E-03	TOTAL	1.130E-03	TOTAL	6.082E-06

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	3.862E-02	3.862E-02	1.842E-03	1.842E-03	5.805E-02	5.805E-02
4.300E-01	1.038E-01	1.424E-01	4.951E-03	6.793E-03	1.560E-01	2.141E-01
2.000E+00	0.000E+00	1.424E-01	1.064E-02	1.744E-02	1.377E-01	4.118E-01
8.000E+00	0.000E+00	1.424E-01	1.720E-03	1.916E-02	1.223E-01	5.342E-01
2.400E+01	0.000E+00	1.424E-01	8.116E-04	1.997E-02	5.928E-02	5.934E-01
9.600E+01	0.000E+00	1.424E-01	6.360E-04	2.060E-02	5.678E-02	6.502E-01
	TOTAL	1.424E-01	TOTAL	2.060E-02	TOTAL	6.502E-01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	2.881E-03	2.881E-03	1.374E-04	1.374E-04	2.290E-05	2.280E-05
2.000E+00	0.000E+00	2.881E-03	2.953E-04	4.327E-04	3.670E-05	5.951E-05
8.000E+00	0.000E+00	2.881E-03	4.776E-05	4.805E-04	2.313E-05	8.264E-05
2.400E+01	0.000E+00	2.881E-03	4.509E-05	5.256E-04	1.356E-05	9.620E-05
9.600E+01	0.000E+00	2.881E-03	3.550E-05	5.611E-04	8.756E-06	1.050E-04
	TOTAL	2.881E-03	TOTAL	5.611E-04	TOTAL	1.050E-04

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	2.461E+01	2.461E+01	1.173E+00	1.173E+00	3.698E+01	3.698E+01
4.300E-01	8.832E+01	1.129E+02	4.212E+00	5.386E+00	1.328E+02	1.697E+02
2.000E+00	0.000E+00	1.129E+02	1.523E+01	2.062E+01	2.831E+02	4.528E+02
8.000E+00	0.000E+00	1.129E+02	2.100E+00	2.272E+01	2.961E+02	7.489E+02
2.400E+01	0.000E+00	1.129E+02	2.969E+00	2.569E+01	3.244E+02	1.073E+03
9.600E+01	0.000E+00	1.129E+02	5.067E+00	3.076E+01	6.767E+02	1.750E+03
	TOTAL	1.129E+02	TOTAL	3.076E+01	TOTAL	1.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	2.451E+00	2.451E+00	1.169E-01	1.169E-01	2.051E-02	2.051E-02
2.000E+00	0.000E+00	2.451E+00	4.228E-01	5.397E-01	5.419E-02	7.470E-02
8.000E+00	0.000E+00	2.451E+00	5.831E-02	5.980E-01	5.669E-02	1.314E-01
2.400E+01	0.000E+00	2.451E+00	1.649E-01	7.629E-01	7.466E-02	2.061E-01
9.600E+01	0.000E+00	2.451E+00	2.829E-01	1.046E+00	1.044E-01	3.105E-01
	TOTAL	2.451E+00	TOTAL	1.046E+00	TOTAL	3.105E-01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	1.394E-01	1.394E-01	6.650E-03	6.650E-03	2.096E-01	2.096E-01
4.300E-01	3.544E-01	4.939E-01	1.690E-02	2.355E-02	5.327E-01	7.423E-01
2.000E+00	0.000E+00	4.939E-01	3.069E-02	5.424E-02	5.703E-01	1.313E+00
8.000E+00	0.000E+00	4.939E-01	3.886E-03	5.813E-02	2.763E-01	1.589E+00
2.400E+01	0.000E+00	4.939E-01	1.638E-03	5.977E-02	1.196E-01	1.709E+00
9.600E+01	0.000E+00	4.939E-01	1.616E-03	6.138E-02	1.443E-01	1.853E+00
	TOTAL	4.939E-01	TOTAL	6.138E-02	TOTAL	1.853E+00

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	9.835E-03	9.835E-03	4.691E-04	4.691E-04	2.353E-06	2.353E-06
2.000E+00	0.000E+00	9.835E-03	8.518E-04	1.321E-03	3.199E-06	5.552E-06
8.000E+00	0.000E+00	9.835E-03	1.079E-04	1.429E-03	1.592E-06	7.144E-06
2.400E+01	0.000E+00	9.835E-03	9.098E-05	1.520E-03	8.387E-07	7.983E-06
9.600E+01	0.000E+00	9.835E-03	9.018E-05	1.610E-03	6.816E-07	8.664E-06
	TOTAL	9.835E-03	TOTAL	1.610E-03	TOTAL	8.664E-06

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	1.781E-01	1.781E-01	8.492E-03	8.492E-03	2.676E-01	2.676E-01
4.300E-01	4.583E-01	6.363E-01	2.186E-02	3.035E-02	6.888E-01	9.564E-01
2.000E+00	0.000E+00	6.363E-01	4.133E-02	7.168E-02	7.680E-01	1.724E+00
8.000E+00	0.000E+00	6.363E-01	5.606E-03	7.729E-02	3.987E-01	2.123E+00
2.400E+01	0.000E+00	6.363E-01	2.449E-03	7.974E-02	1.789E-01	2.302E+00
9.600E+01	0.000E+00	6.363E-01	2.252E-03	8.199E-02	2.010E-01	2.503E+00
	TOTAL	6.363E-01	TOTAL	8.199E-02	TOTAL	2.503E+00

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	1.272E-02	1.272E-02	6.065E-04	6.065E-04	2.516E-05	2.516E-05
2.000E+00	0.000E+00	1.272E-02	1.147E-03	1.754E-03	3.990E-05	6.506E-05
8.000E+00	0.000E+00	1.272E-02	1.557E-04	1.909E-03	2.473E-05	8.978E-05
2.400E+01	0.000E+00	1.272E-02	1.361E-04	2.045E-03	1.440E-05	1.042E-04
9.600E+01	0.000E+00	1.272E-02	1.257E-04	2.171E-03	9.438E-06	1.136E-04
	TOTAL	1.272E-02	TOTAL	2.171E-03	TOTAL	1.136E-04

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 3

Unit 2 MHA ESF Seal Failure
TRANSACT Input and Output

(MHACASE5.R5, MHACASE5.RV5)

Input - MHACASE5.R5

```
'ICRP30a                                                                                  '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)                    '
' MHACASE5.R5  UNIT 2 MHA ESF SEAL FAILURE '
'                                                                                         '
 0, 0, 0, 1, 0
  1,  3
'sc cool  '
 29
 3.087E+03, 0.000E+00
 0.500E+00, 0.000E+00
 0.000E+00, 0.000E+00
 1.000E+00, 0.000E+00, 0.000E+00
 0.000E+00, 0.000E+00, 0.000E+00
 6.2898E+04, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 2.400E+01
'INITIAL FRACTION',0,0,0,0,1, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02

'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 2.410E+01
'TRANSFER CFM    ',0,0,0,1,1, 6.685E-01
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E+00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0000E+00

'TIME INTERVAL   ',0,0,0,0,2, 2.410E+01, 2.420E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.420E+01, 2.430E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.430E+01, 2.440E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.440E+01, 2.450E+01

'TIME INTERVAL   ',0,0,0,0,2, 2.450E+01, 2.460E+01
'TRANSFER CFM    ',0,0,0,1,1, 0.000E+00

'TIME INTERVAL   ',0,0,0,0,2, 2.460E+01, 2.470E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.470E+01, 2.480E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.480E+01, 2.490E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.490E+01, 2.500E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.500E+01, 2.510E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.510E+01, 2.520E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.520E+01, 2.530E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.530E+01, 2.540E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.540E+01, 2.550E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.550E+01, 2.560E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.560E+01, 2.570E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.570E+01, 2.580E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.580E+01, 2.590E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.590E+01, 2.600E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.600E+01, 2.610E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.610E+01, 2.620E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.620E+01, 2.630E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.630E+01, 2.640E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.640E+01, 2.650E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.650E+01, 2.660E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.660E+01, 9.600E+01

'TIME INTERVAL   ',0,0,0,0,2, 9.600E+01, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+01, 3.330E+02, 3.430E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E+00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0000E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output - MHACASE5.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   8:54:46

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)
  MHACASE5.R5  UNIT 2 MHA ESF SEAL FAILURE
1                           TIME INDEPENDENT INPUT
                              CASE NUMBER   1


                                NODES  NSTEP
                                  1     29

                            OUTPUT CONTROL PARAMETER
                         I        1    2    3    4    5
                    IPRINT(I)     0    0    0    1    0

                    NUMBER OF DOSE EVALUATION POINTS -   3


                  POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          5.000E-01     0.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         5.000E-01     0.000E+00


                            ISOTOPIC SPLIT BY GROUP
                        ELEM.         ORG.          PART.
      HALOGENS       1.000E+00     0.000E+00     0.000E+00
                     0.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
           sc cool
           6.290E+04


                            CONTROL ROOM VOLUME (CU FT)
                                      4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
0(3)	11/30/00	KLA	JL		91-E-0117-16	
0(2)	10/10/00	JGM	MAM	ARKANSAS NUCLEAR ONE		
0	8/26/99	JGM	MAM		PAGE NUMBER	Attachment 3
REV.	DATE	BY	CHK'D			3 OF 10

DATA FROM NUCLIDE FILE ICRP30a

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.5080000E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.8060000E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.6220000E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	6.5750000E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E-03	5.860E-01	0.000E+00
I 135	ELEM.	5.1030000E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E-04	3.520E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   2.40000E+01
INITIAL FRACTION       0    0    0    0    1   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   2.41000E+01
TRANSFER CFM           0    0    0    1    1   6.68500E-01
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   0.00000E-00
TIME INTERVAL          0    0    0    0    2   2.41000E+01   2.42000E+01
TIME INTERVAL          0    0    0    0    2   2.42000E+01   2.43000E+01
TIME INTERVAL          0    0    0    0    2   2.43000E+01   2.44000E+01
TIME INTERVAL          0    0    0    0    2   2.44000E+01   2.45000E+01
TIME INTERVAL          0    0    0    0    2   2.45000E+01   2.46000E+01
TRANSFER CFM           0    0    0    1    1   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.46000E+01   2.47000E+01
TIME INTERVAL          0    0    0    0    2   2.47000E+01   2.48000E+01
TIME INTERVAL          0    0    0    0    2   2.48000E+01   2.49000E+01
TIME INTERVAL          0    0    0    0    2   2.49000E+01   2.50000E+01
TIME INTERVAL          0    0    0    0    2   2.50000E+01   2.51000E+01
TIME INTERVAL          0    0    0    0    2   2.51000E+01   2.52000E+01
TIME INTERVAL          0    0    0    0    2   2.52000E+01   2.53000E+01
TIME INTERVAL          0    0    0    0    2   2.53000E+01   2.54000E+01
TIME INTERVAL          0    0    0    0    2   2.54000E+01   2.55000E+01
TIME INTERVAL          0    0    0    0    2   2.55000E+01   2.56000E+01
TIME INTERVAL          0    0    0    0    2   2.56000E+01   2.57000E+01
TIME INTERVAL          0    0    0    0    2   2.57000E+01   2.58000E+01
TIME INTERVAL          0    0    0    0    2   2.58000E+01   2.59000E+01
TIME INTERVAL          0    0    0    0    2   2.59000E+01   2.60000E+01
TIME INTERVAL          0    0    0    0    2   2.60000E+01   2.61000E+01
TIME INTERVAL          0    0    0    0    2   2.61000E+01   2.62000E+01
TIME INTERVAL          0    0    0    0    2   2.62000E+01   2.63000E+01
TIME INTERVAL          0    0    0    0    2   2.63000E+01   2.64000E+01
TIME INTERVAL          0    0    0    0    2   2.64000E+01   2.65000E+01
TIME INTERVAL          0    0    0    0    2   2.65000E+01   2.66000E+01
TIME INTERVAL          0    0    0    0    2   2.66000E+01   9.60000E+01
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   1.00000E+01   3.33000E+02
 3.43000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   0.00000E-00
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME	EXCLUSION RADIUS EACH	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH	CONTROL ROOM ACCUM.

(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E-00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.056E-03	1.056E-03	1.289E-06	1.289E-06
2.410E+01	0.000E+00	0.000E+00	1.052E-03	2.108E-03	3.414E-06	4.703E-06
2.420E+01	0.000E+00	0.000E+00	1.048E-03	3.156E-03	4.989E-06	9.692E-06
2.430E+01	0.000E+00	0.000E+00	1.043E-03	4.199E-03	6.154E-06	1.585E-05
2.440E+01	0.000E+00	0.000E+00	1.039E-03	5.238E-03	7.012E-06	2.286E-05
2.450E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	6.380E-06	2.924E-05
2.460E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	4.760E-06	3.400E-05
2.470E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.550E-06	3.755E-05
2.480E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.649E-06	4.020E-05
2.490E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.976E-06	4.217E-05
2.500E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.474E-06	4.365E-05
2.510E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.100E-06	4.475E-05
2.520E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	8.203E-07	4.557E-05
2.530E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	6.120E-07	4.618E-05
2.540E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	4.566E-07	4.664E-05
2.550E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.406E-07	4.698E-05
2.560E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.541E-07	4.723E-05
2.570E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.896E-07	4.742E-05
2.580E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.415E-07	4.756E-05
2.590E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.055E-07	4.767E-05
2.600E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	7.875E-08	4.775E-05
2.610E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	5.876E-08	4.780E-05
2.620E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	4.384E-08	4.785E-05
2.630E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.271E-08	4.788E-05
2.640E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.441E-08	4.791E-05
2.650E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.821E-08	4.792E-05
2.660E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	0.000E+00	4.792E-05
9.600E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	0.000E+00	4.792E-05
	TOTAL	0.000E+00	TOTAL	5.238E-03	TOTAL	4.792E-05

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	7.466E-04	7.466E-04	2.974E-05	2.974E-05
2.410E+01	0.000E+00	0.000E+00	7.440E-04	1.491E-03	7.893E-05	1.086E-04
2.420E+01	0.000E+00	0.000E+00	7.414E-04	2.232E-03	1.153E-04	2.238E-04
2.430E+01	0.000E+00	0.000E+00	7.388E-04	2.971E-03	1.423E-04	3.661E-04
2.440E+01	0.000E+00	0.000E+00	7.363E-04	3.707E-03	1.622E-04	5.283E-04
2.450E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.477E-04	6.761E-04
2.460E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.103E-04	7.863E-04
2.470E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	8.231E-05	8.686E-04
2.480E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	6.145E-05	9.301E-04
2.490E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	4.587E-05	9.760E-04
2.500E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	3.424E-05	1.010E-03
2.510E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.556E-05	1.036E-03
2.520E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.908E-05	1.055E-03
2.530E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.425E-05	1.069E-03
2.540E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.063E-05	1.080E-03
2.550E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	7.939E-06	1.088E-03
2.560E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	5.927E-06	1.094E-03
2.570E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	4.425E-06	1.098E-03
2.580E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	3.303E-06	1.101E-03
2.590E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.466E-06	1.104E-03
2.600E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.841E-06	1.106E-03
2.610E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.374E-06	1.107E-03

2.620E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.026E-06	1.108E-03
2.630E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	7.661E-07	1.109E-03
2.640E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	5.719E-07	1.109E-03
2.650E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	4.270E-07	1.110E-03
2.660E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	0.000E+00	1.110E-03
9.600E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	0.000E+00	1.110E-03
	TOTAL	0.000E+00	TOTAL	3.707E-03	TOTAL	1.110E-03

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.575E+00	1.575E+00	9.395E-02	9.395E-02
2.410E+01	0.000E+00	0.000E+00	1.574E+00	3.149E+00	2.495E-01	3.434E-01
2.420E+01	0.000E+00	0.000E+00	1.572E+00	4.722E+00	3.657E-01	7.091E-01
2.430E+01	0.000E+00	0.000E+00	1.571E+00	6.293E+00	4.525E-01	1.162E+00
2.440E+01	0.000E+00	0.000E+00	1.570E+00	7.863E+00	5.173E-01	1.679E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	4.722E-01	2.151E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	3.534E-01	2.504E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.644E-01	2.769E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.979E-01	2.967E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.481E-01	3.115E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.108E-01	3.226E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	8.295E-02	3.309E+00

2.520E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	6.208E-02	3.371E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	4.646E-02	3.417E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	3.477E-02	3.452E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.602E-02	3.478E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.947E-02	3.498E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.457E-02	3.512E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.091E-02	3.523E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	8.163E-03	3.531E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	6.109E-03	3.537E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	4.572E-03	3.542E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	3.422E-03	3.545E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.561E-03	3.548E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.917E-03	3.550E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.434E-03	3.551E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	0.000E+00	3.551E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	0.000E+00	3.551E+00
	TOTAL	0.000E+00	TOTAL	7.863E+00	TOTAL	3.551E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.509E-03	1.509E-03	1.841E-06	1.841E-06
2.410E+01	0.000E+00	0.000E+00	1.502E-03	3.011E-03	4.876E-06	6.716E-06

2.420E+01	0.000E+00	0.000E+00	1.496E-03	4.507E-03	7.125E-06	1.384E-05
2.430E+01	0.000E+00	0.000E+00	1.490E-03	5.997E-03	8.788E-06	2.263E-05
2.440E+01	0.000E+00	0.000E+00	1.484E-03	7.480E-03	1.001E-05	3.264E-05
2.450E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	9.112E-06	4.176E-05
2.460E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	6.797E-06	4.855E-05
2.470E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	5.071E-06	5.362E-05
2.480E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.783E-06	5.741E-05
2.490E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.822E-06	6.023E-05
2.500E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.105E-06	6.233E-05
2.510E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.571E-06	6.390E-05
2.520E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.172E-06	6.508E-05
2.530E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	8.741E-07	6.595E-05
2.540E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	6.521E-07	6.660E-05
2.550E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	4.865E-07	6.709E-05
2.560E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.630E-07	6.745E-05
2.570E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.708E-07	6.772E-05
2.580E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.021E-07	6.792E-05
2.590E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.508E-07	6.807E-05
2.600E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.125E-07	6.819E-05
2.610E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	8.393E-08	6.827E-05
2.620E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	6.262E-08	6.833E-05
2.630E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	4.672E-08	6.838E-05
2.640E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.486E-08	6.842E-05
2.650E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.601E-08	6.844E-05
2.660E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	0.000E+00	6.844E-05
9.600E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	0.000E+00	6.844E-05
	TOTAL	0.000E+00	TOTAL	7.480E-03	TOTAL	6.844E-05

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	2.255E-03	2.255E-03	3.158E-05	3.158E-05
2.410E+01	0.000E+00	0.000E+00	2.246E-03	4.501E-03	8.370E-05	1.153E-04
2.420E+01	0.000E+00	0.000E+00	2.237E-03	6.739E-03	1.224E-04	2.377E-04
2.430E+01	0.000E+00	0.000E+00	2.229E-03	8.967E-03	1.511E-04	3.887E-04
2.440E+01	0.000E+00	0.000E+00	2.220E-03	1.119E-02	1.723E-04	5.610E-04
2.450E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.568E-04	7.178E-04
2.460E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.171E-04	8.349E-04
2.470E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	8.738E-05	9.223E-04
2.480E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	6.523E-05	9.875E-04
2.490E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.869E-05	1.036E-03
2.500E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	3.635E-05	1.073E-03
2.510E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.713E-05	1.100E-03
2.520E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.025E-05	1.120E-03
2.530E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.512E-05	1.135E-03
2.540E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.129E-05	1.146E-03
2.550E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	8.426E-06	1.155E-03
2.560E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	6.290E-06	1.161E-03
2.570E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.696E-06	1.166E-03
2.580E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	3.505E-06	1.169E-03
2.590E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.617E-06	1.172E-03
2.600E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.954E-06	1.174E-03
2.610E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.458E-06	1.175E-03
2.620E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.089E-06	1.176E-03
2.630E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	8.128E-07	1.177E-03
2.640E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	6.068E-07	1.178E-03
2.650E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.530E-07	1.178E-03
2.660E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	0.000E+00	1.178E-03
9.600E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	0.000E+00	1.178E-03
	TOTAL	0.000E+00	TOTAL	1.119E-02	TOTAL	1.178E-03

1 NO MORE CASES

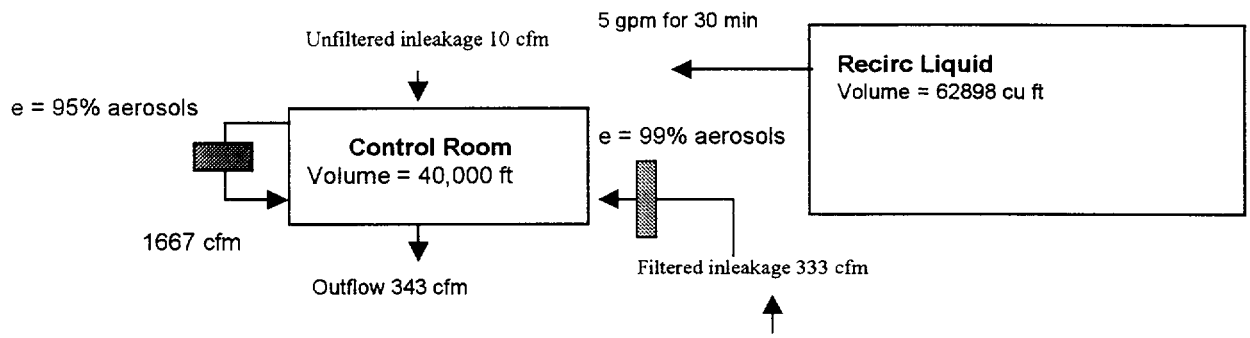
END OF EXECUTION

ATTACHMENT 4

Control Room Dose Analytical Solution

Control Room Dose Analytical Solution

For a passive failure, the liquid release and control room are modeled as shown below:



Passive Failure Accident Model

For the control room, the activity concentration of isotope i at the control room intake, $C^i_{out}(t)$, can be calculated as:

$$C^i_{out}(t) = A^i_{recirc}(t=0)\cdot e^{-\lambda^i\cdot t}\cdot f_\ell \cdot \frac{\chi_{CR}}{Q} \qquad \text{(A-1)}$$

where:

$A^i_{recirc}(t)$ = activity of isotope i available for release from recirc system at time t

f_ℓ = ESF leak rate (5 gpm),

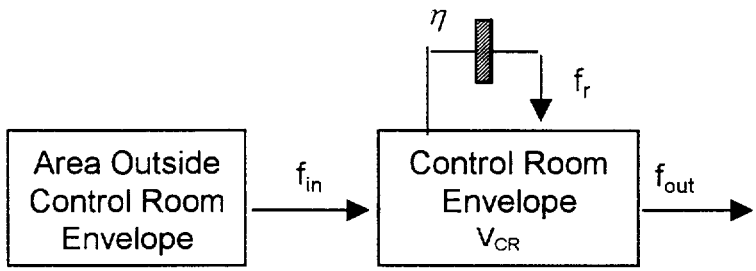
$\frac{\chi_{CR}}{Q}$ = dispersion coefficient to control room intake.

λ^i = decay constant for isotope i

If the production of daughter products is ignored in the recirculation liquid, the transient activity in the liquid is simply:

$$A^i_{recirc}(t) = A^i_{recirc}(t=0)\cdot e^{-\lambda^i\cdot t} \qquad \text{(A-2)}$$

The control room is modeled as a homogeneously mixed volume with an inflow and an equivalent outflow with a filtered recirculation flow. The transient activity concentration inside the control room can then be calculated relative to the activity concentration outside the control room envelope. This model is illustrated below.



Control Room Model

An activity balance for the control room concentration can then be developed for each isotope.

$$\frac{d}{dt}C^i_{CR}(t) = \frac{C_{out}^{\ i}(t)\cdot(f_{in,filt}\cdot\eta_{in} + f_{in,unfilt})}{V_{CR}} - \frac{C^i_{CR}(t)*f_{out}}{V_{CR}} - \frac{C^i_{CR}(t)*f_r*\eta_R}{V_{CR}} - \lambda^{\ i}\cdot C^i_{CR}(t) \qquad \text{(A-3)}$$

where:

$C^i_{CR}(t)$	=	transient activity concentration in the control room
$C_{out}^{\ i}(t)$	=	activity concentration outside the control room envelope
$f_{in,filt}$	=	filtered leakage rate into the control room
$f_{in,unfilt}$	=	unfiltered inleakage rate into the control room
V_{CR}	=	volume of the control room
f_{out}	=	leakage rate out of the control room
f_r	=	recirculation flow rate
η_R	=	efficiency of the control room recirculation filters (isotope and species dependent)
η_{in}	=	efficiency of the control room intake filters (isotope and species dependent)

Assuming the area outside the control room envelope is so large that the concentration is unchanged with the inleakage, the control room activity concentration can be written as:

$$\frac{d}{dt}C^i_{CR}(t)=\frac{A^i_{cond}(t=0)\cdot e^{-\lambda^i\cdot t}\cdot f_\ell\cdot\frac{\chi_{CR}}{Q}\cdot(f_{in,filt}\cdot\eta_{in}+f_{in,unfilt})}{V_{CR}}-\frac{C^i_{CR}(t)\cdot f_{out}}{V_{CR}}-\frac{C^i_{CR}(t)\cdot f_r\cdot\eta_R}{V_{CR}}-\lambda^i\cdot C^i_{CR}(t)$$

$$\frac{d}{dt}C^i_{CR}(t)+\left(\frac{f_{out}}{V_{CR}}+\frac{f_r\cdot\eta_R}{V_{CR}}+\lambda^i\right)\cdot C^i_{CR}(t)=\frac{A^i_{recirc}(t=0)\cdot f_\ell\cdot\frac{\chi_{CR}}{Q}\cdot(f_{in,filt}\cdot\eta_{in}+f_{in,unfilt})}{V_{CR}}\cdot e^{-\lambda^i\cdot t}$$

$$\frac{d}{dt}C^i_{CR}(t)+\alpha\cdot C^i_{CR}(t)=\beta\cdot e^{-\lambda^i\cdot t}$$

$$\int_{t_1}^{t_2}d\left[C^i_{CR}(t)\cdot e^{\alpha\cdot t}\right]=\int_{t_1}^{t_2}\beta\cdot e^{(\alpha-\lambda^i)t}dt$$

$$C^i_{CR}(t)\cdot e^{\alpha\cdot t_2}-C^i_{CR}(t=t_1)\cdot e^{\alpha\cdot t_1}=\frac{\beta}{(\alpha-\lambda^i)}\cdot\left[e^{(\alpha-\lambda^i)t_2}-e^{(\alpha-\lambda^i)t_1}\right]$$

$$C^i_{CR}(t)=\left\{\frac{\beta}{\alpha-\lambda^i}\left[e^{(\alpha-\lambda^i)t_2}-e^{(\alpha-\lambda^i)t_1}\right]+C^i_{CR}(t=t_1)\cdot e^{\alpha\cdot t_1}\right\}\cdot e^{-\alpha\cdot t_2}$$

$$C^i_{CR}(t)=\frac{\beta}{\alpha-\lambda^i}e^{-\lambda^i\cdot t_2}+\left\{C^i_{CR}(t=t_1)\cdot e^{\alpha\cdot t_1}-\frac{\beta}{\alpha-\lambda^i}\cdot e^{(\alpha-\lambda^i)t_1}\right\}\cdot e^{-\alpha\cdot t_2}$$

$$C^i_{CR}(t)=\frac{\beta}{\alpha-\lambda^i}e^{-\lambda^i\cdot t_2}+\gamma\cdot e^{-\alpha\cdot t_2} \qquad \text{(A-4)}$$

where:

$$\alpha=\left(\frac{f_{out}}{V_{CR}}+\frac{f_r\cdot\eta_R}{V_{CR}}+\lambda^i\right)$$

$$\beta=\frac{A^i_{recirc}(t=0)\cdot f_\ell\cdot\frac{\chi_{CR}}{Q}\cdot(f_{in,filt}\cdot\eta_{in}+f_{in,unfilt})}{V_{CR}}$$

$$\gamma=C^i_{CR}(t=t_1)\cdot e^{\alpha\cdot t_1}-\frac{\beta}{\alpha-\lambda^i}\cdot e^{(\alpha-\lambda^i)t_1}$$

The control room dose can be calculated from the integrated exposure. The inhalation or thyroid dose associated with this transient concentration is:

$$
\begin{aligned}
Inhaled\ Dose^{i}_{CR} &= \int_{t_1}^{t_2} C^{i}_{CR}(t) \cdot BR \cdot DCF^{i} \cdot \mathrm{Occ} \cdot dt \\
&= \int_{t_1}^{t_2} \left(\frac{\beta}{\alpha - \lambda^{i}} e^{-\lambda^{i} \cdot t} + \gamma \cdot e^{-\alpha \cdot t} \right) \cdot BR \cdot DCF^{i} \cdot Occ \cdot dt \\
&= BR \cdot DCF^{i} \cdot Occ \cdot \left(\int_{t_1}^{t_2} \frac{\beta}{\alpha - \lambda^{i}} e^{-\lambda^{i} \cdot t} \cdot dt + \int_{t_1}^{t_2} \gamma \cdot e^{-\alpha \cdot t} \cdot dt \right) \\
&= BR \cdot DCF^{i} \cdot Occ \cdot \left\{ \frac{\beta}{\alpha - \lambda^{i}} \cdot \frac{1}{\lambda^{i}} \cdot \left(e^{-\lambda^{i} \cdot t_1} - e^{-\lambda^{i} \cdot t_2} \right) + \frac{\gamma}{\alpha} \cdot \left(e^{-\alpha \cdot t_1} - e^{-\alpha \cdot t_2} \right) \right\}
\end{aligned}
\qquad \text{(A-5)}
$$

where[1]:

BR = breathing rate
DCF^{i} = dose conversion factor for isotope I
Occ = Control Room Occupancy

The whole body dose can also be calculated similarly.

$$
WB\ Dose^{i}_{CR} = \frac{DCF^{i}}{MCGF} \cdot Occ \cdot \left\{ \frac{\beta}{\alpha - \lambda^{i}} \cdot \frac{1}{\lambda^{i}} \cdot \left(e^{-\lambda^{i} \cdot t_1} - e^{-\lambda^{i} \cdot t_2} \right) + \frac{\gamma}{\alpha} \cdot \left(e^{-\alpha \cdot t_1} - e^{-\alpha \cdot t_2} \right) \right\} \qquad \text{(A-6)}
$$

where:

DCF is the air immersion dose conversion coefficient (Rem-m^3/Ci-s),
MCGF is the Murphy-Campe Geometry Factor = $1173/V_{CR}^{0.338}$ = 27.27.

When the release ends after 0.5 hours, the leakage rate can be set to zero and the dose associated with the residual activity in the control room can be calculated with a timestep from 24.5 hours to 30 days (or an appropriate extended period).

---

1 Occupancy factor is taken to be 0.6 throughout the evaluation period (starting at 24 hrs). Breathing rate, leak rate, and χ/Q are constant between times t_1 and t_2.

Power Level (Mwt) = 3087

	Source (Ci/Mwt)	Source (Ci)	Fraction Released from Fuel	Activity Available for Release from RCS (Ci)	Decay Constant (1/hr)	CR Intake Filter Efficiency	CR Recirc Filter Efficiency	Whole Body DCF (Rem-m3/Ci-s)
I-131	2.508E+04	7.742E+07	50%	3.871E+07	3.59E-03	99.00%	95.00%	5.5900E-02
I-132	3.806E+04	1.175E+08	50%	5.875E+07	2.98E-01	99.00%	95.00%	3.5500E-01
I-133	5.622E+04	1.736E+08	50%	8.678E+07	3.32E-02	99.00%	95.00%	9.1100E-02
I-134	6.575E+04	2.030E+08	50%	1.015E+08	8.02E-01	99.00%	95.00%	4.1100E-01
I-135	5.103E+04	1.575E+08	50%	7.876E+07	1.03E-01	99.00%	95.00%	2.4900E-01

Start Time (sec)	0
End Time (sec)	86400
Release Rate (1/s)	0.0000E+00
CR Breathing Rate (m3/s)	3.47E-04
CR Volume (m3)	1.13E+03
CR X/Q (s/m3)	1.68E-04
CR Recirc Flow (m3/s)	7.8674E-01
CR Flow In (m3/s)	6.2911E-03
CR Flow Out (m3/s)	1.6188E-01
Control Room Occupancy =	0.6

	RCS Activity at end of time (Ci)	Initial CR Conc	a	b	g	Final CR Conc (Ci/m3)	CR Whole Body Dose (Rem)	CR Thyroid Dose (Rem)
I-131	3.55E+07	0.00E+00	8.04E-04	0.00E+00	0.00E+00	0.00E+00	0.000E+00	0.00E+00
I-132	4.64E+04	0.00E+00	8.85E-04	0.00E+00	0.00E+00	0.00E+00	0.000E+00	0.00E+00
I-133	3.91E+07	0.00E+00	8.12E-04	0.00E+00	0.00E+00	0.00E+00	0.000E+00	0.00E+00
I-134	4.43E-01	0.00E+00	1.03E-03	0.00E+00	0.00E+00	0.00E+00	0.000E+00	0.00E+00
I-135	6.63E+06	0.00E+00	8.31E-04	0.00E+00	0.00E+00	0.00E+00	0.000E+00	0.00E+00
							0.000E+00	0.000E+00

Start Time (sec)	86400
End Time (sec)	88200
Release Rate (1/s)	1.7711E-07
CR Breathing Rate (m3/s)	3.47E-04
CR Volume (m3)	1.13E+03
CR X/Q (s/m3)	1.68E-04
CR Recirc Flow (m3/s)	7.8674E-01
CR Flow In (m3/s)	6.2911E-03
CR Flow Out (m3/s)	1.6188E-01
Control Room Occupancy =	0.6

	RCS Activity at end of time (Ci)	Initial CR Conc	a	b	g	Final CR Conc (Ci/m3)	CR Whole Body Dose (Rem)	CR Thyroid Dose (Rem)
I-131	3.55E+07	0.00E+00	8.04E-04	6.40E-09	-1.06E+25	5.58E-06	1.187E-05	1.42E+00
I-132	4.00E+04	0.00E+00	8.85E-04	9.71E-09	-1.60E+25	6.29E-09	8.975E-08	9.67E-06
I-133	3.85E+07	0.00E+00	8.12E-04	1.43E-08	-2.37E+25	6.05E-06	2.111E-05	2.53E-01
I-134	2.97E-01	0.00E+00	1.03E-03	1.68E-08	-2.77E+25	4.67E-14	8.501E-13	1.38E-11
I-135	6.30E+06	0.00E+00	8.31E-04	1.30E-08	-2.15E+25	9.91E-07	9.569E-06	7.23E-03
							4.264E-05	1.679E+00

Start Time (s)	88200
End Time (s)	9.36E+04
Release Rate (1/s)	0.00E+00
CR Breathing Rate (m3/s)	3.47E-04
CR Volume (m3)	1.13E+03
CR X/Q (s/m3)	1.68E-04
CR Recirc Flow (m3/s)	7.8674E-01
CR Flow In (m3/s)	6.2911E-03
CR Flow Out (m3/s)	1.6188E-01
Control Room Occupancy =	0.6

	RCS Activity at end of time (Ci)	Initial CR Conc	a	b	g	Final CR Conc (Ci/m3)	CR Whole Body Dose (Rem)	CR Thyroid Dose (Rem)
I-131	3.53E+07	5.58E-06	8.04E-04	0.00E+00	3.42E+25	7.27E-08	1.313E-05	1.57E+00
I-132	2.56E+04	6.29E-09	8.85E-04	0.00E+00	5.20E+25	5.27E-11	8.568E-08	9.23E-06
I-133	3.66E+07	6.05E-06	8.12E-04	0.00E+00	7.68E+25	7.55E-08	2.300E-05	2.76E-01
I-134	8.90E-02	4.67E-14	1.03E-03	0.00E+00	8.98E+25	1.84E-16	6.386E-13	1.04E-11
I-135	5.40E+06	9.91E-07	8.31E-04	0.00E+00	6.97E+25	1.11E-08	1.006E-05	7.61E-03
							4.628E-05	1.852E+00

The control room doses are as shown below.

	Dose in Time Interval	
Interval	CR Whole Body Dose	CR Thyroid Dose
0-24 hr	0.000E+00	0
24 - 24.5 hrs	4.264E-05	1.6789633
24.5 hrs +	4.628E-05	1.8522537
TOTAL	**8.892E-05**	**3.531E+00**

ATTACHMENT 5

Unit 2 MHA 50 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA1A.R5, MHA1A.RV5)

Input - MHA1A.R5

```
'ICRP30A                                                                    '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)               '
' MHA1A.R5  UNIT 2 50 CFM INLEAKAGE '
'                                                                           '
 0, 0, 0, 1, 0
  2,  3
'RBSPRAY ', 'UNSPRAY'
 11
 3.087E+03, 0.000E+00
 .2500E+00, 1.000E+00
 .0000E+00, 0.000E+00
 .9100E+00, .0400E+00, .0500E+00
 1.000E+00, 0.000E+00, 0.000E+00
 1.332E+06, 3.831E+05, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.001E-02
'INITIAL FRACTION',0,0,0,0,2, 0.780E+00, 0.220E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.001E-02, 0.015E+00
'CONTROL ROOM    ',0,0,0,0,5, 5.000E+01, 3.330E+02, 3.830E-02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 0.001E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 0.001E-03, 0.000E-00
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.015E+00, 0.0175E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 1.284E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 4.465E+03, 0.000E-00
'TIME INTERVAL   ',0,0,0,0,2, 0.0175E+00, 0.43E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 3.970E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.430E+00, 1.853E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 4.240E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.853E+00, 1.980E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.980E+00, 2.000E+00
'REMOVAL RATE    ',1,1,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E-00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 2.560E-04, 3.470E-04,
.1000E-00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.050E+00, 0.000E+00, 1.284E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.050E+00, 4.465E+03, 0.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 5.000E+01, 3.330E+02, 3.830E-02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E-00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 5.000E+01, 3.330E+02, 3.830E-02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E-00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output - MHA1A.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   9: 0: 1

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)
  MHA1A.R5  UNIT 2 50 CFM INLEAKAGE
1                            TIME INDEPENDENT INPUT
                               CASE NUMBER   1


                                  NODES  NSTEP
                                    2     11

                             OUTPUT CONTROL PARAMETER
                         I        1    2    3    4    5
                    IPRINT(I)     0    0    0    1    0

                    NUMBER OF DOSE EVALUATION POINTS -   3


                  POWER (MWT)     REACTOR SHUTDOWN TIME (HRS)
                    3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          2.500E-01     1.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         2.500E-01     1.000E+00


                             ISOTOPIC SPLIT BY GROUP
                         ELEM.          ORG.          PART.
      HALOGENS       9.100E-01     4.000E-02     5.000E-02
                     1.000E+00     0.000E+00     0.000E+00


                             VOLUME OF NODES (CU FT)
           RBSPRAY        UNSPRAY
           1.332E+06      3.931E+05


                             CONTROL ROOM VOLUME (CU FT)
                                      4.000E+04
```

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.2822800E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	ORG.	1.0032000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	PART.	1.2540000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.4634600E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	ORG.	1.5224000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	PART.	1.9030000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.1160200E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	ORG.	2.2488000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	PART.	2.8110000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	5.9832500E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	ORG.	2.6300000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	PART.	3.2875000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	4.6437300E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	ORG.	2.0412000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	PART.	2.5515000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
KR 83M	ELEM.	4.1520000E+03	3.7260000E-01	1.270E-05	0.000E+00	0.000E+00	1.360E-04	0.000E+00
KR 85M	ELEM.	1.2970000E+04	1.5786000E-01	2.310E-02	4.970E-02	0.000E+00	3.200E-02	0.000E+00
KR 85	ELEM.	4.1020000E+02	7.3512000E-06	3.310E-04	4.840E-02	0.000E+00	4.750E-04	0.000E+00
KR 87	ELEM.	2.3350000E+04	5.4684000E-01	1.330E-01	3.360E-01	0.000E-00	1.850E-01	0.000E+00
KR 88	ELEM.	3.2000000E+04	2.4750000E-01	3.380E-01	7.760E-02	0.000E-00	4.690E-01	0.000E+00
KR 89	ELEM.	3.9790000E+04	1.3068000E+01	3.030E-01	3.470E-01	0.000E-00	4.210E-01	0.000E+00
XE 131M	ELEM.	2.5950000E+02	2.4048000E-03	1.250E-03	1.330E-02	0.000E+00	2.710E-03	0.000E+00
XE 133M	ELEM.	1.3840000E+03	1.2564000E-02	4.290E-03	2.960E-02	0.000E-00	7.000E-03	0.000E+00
XE 133	ELEM.	5.6220000E+04	5.4792000E-03	4.960E-03	9.670E-03	0.000E-00	7.890E-03	0.000E+00
XE 135M	ELEM.	1.5570000E+04	2.6640000E-00	6.370E-02	2.140E-02	0.000E-00	9.160E-02	0.000E+00
XE 135	ELEM.	5.3630000E+04	7.5311970E-02	3.590E-02	6.320E-02	0.000E-00	5.070E-02	0.000E+00
XE 137	ELEM.	5.1030000E+04	1.0659600E+01	2.830E-02	4.590E-01	0.000E-00	4.020E-02	0.000E+00
XE 138	ELEM.	4.7750000E+04	2.4465600E+00	1.870E-01	1.470E-01	0.000E+00	2.610E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

TIME INTERVAL	0	0	0	0	2	0.00000E+00	1.00000E-05
INITIAL FRACTION	0	0	0	0	2	7.80000E-01	2.20000E-01
TIME INTERVAL	0	0	0	0	2	1.00000E-05	1.50000E-02
CONTROL ROOM	0	0	0	0	5	5.00000E+01	3.33000E+02
3.83000E+02 1.66700E+03 1.00000E+00							
CR FILTER EFF	1	1	0	0	2	9.50000E+01	9.90000E+01
CR FILTER EFF	1	2	0	0	2	9.50000E+01	9.90000E+01
CR FILTER EFF	1	3	0	0	2	9.50000E+01	9.90000E+01
TRANSFER PERCENT	0	0	0	1	3	1.00000E-01	0.00000E+00
1.00000E-06							
TRANSFER PERCENT	0	0	0	2	3	1.00000E-01	1.00000E-06
1.00000E+00							
DOSE PARAMS	0	0	0	0	7	6.50000E-04	3.47000E-04
3.10000E-05 3.47000E-04 9.77000E-04 3.47000E-04 1.00000E-01							
TIME INTERVAL	0	0	0	0	2	1.50000E-02	1.75000E-02
TRANSFER PERCENT	0	0	0	1	3	1.00000E-01	0.00000E+00
1.28400E+03							
TRANSFER PERCENT	0	0	0	2	3	1.00000E-01	4.46500E+03
0.00000E+00							
TIME INTERVAL	0	0	0	0	2	1.75000E-02	4.30000E-01
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	3.97000E+00	0.00000E+00
TIME INTERVAL	0	0	0	0	2	4.30000E-01	1.85300E+00
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	4.24000E+00	0.00000E+00
TIME INTERVAL	0	0	0	0	2	1.85300E+00	1.98000E+00
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	4.24000E-01	0.00000E+00

```
TIME INTERVAL          0    0    0    0    2   1.98000E+00   2.00000E+00
REMOVAL RATE           1    1    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
TRANSFER PERCENT       0    0    0    1    3   5.00000E-02   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   5.00000E-02   4.46500E+03
 0.00000E+00
CONTROL ROOM           0    0    0    0    5   5.00000E+01   3.33000E+02
 3.83000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   5.00000E+01   3.33000E+02
 3.83000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.004E-01	1.004E-01
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	1.624E-02	1.167E-01
1.750E-02	1.277E+00	1.354E+00	6.089E-02	6.459E-02	1.919E+00	2.036E+00
4.300E-01	2.717E+00	4.072E+00	1.296E-01	1.942E-01	4.084E+00	6.120E+00
1.853E+00	1.868E-01	4.259E+00	8.911E-03	2.031E-01	2.808E-01	6.401E+00
1.980E+00	2.886E-02	4.287E+00	1.376E-03	2.045E-01	4.337E-02	6.444E+00
2.000E+00	0.000E+00	4.287E+00	2.392E-01	4.437E-01	4.445E+00	1.089E+01
8.000E+00	0.000E+00	4.287E+00	2.310E-02	4.668E-01	1.642E+00	1.253E+01
2.400E+01	0.000E+00	4.287E+00	8.559E-03	4.754E-01	6.252E-01	1.316E+01
9.600E+01	0.000E+00	4.287E+00	8.313E-03	4.837E-01	7.422E-01	1.390E+01
	TOTAL	4.287E+00	TOTAL	4.837E-01	TOTAL	1.390E+01

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	9.805E-06	9.805E-06
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	3.477E-06	1.328E-05
1.750E-02	9.619E-01	1.039E+00	4.587E-02	4.957E-02	3.912E-03	3.925E-03
4.300E-01	1.671E+00	2.710E+00	7.969E-02	1.293E-01	3.134E-02	3.526E-02
1.853E+00	1.109E-01	2.821E+00	5.291E-03	1.346E-01	3.444E-03	3.871E-02
1.980E+00	1.713E-02	2.838E+00	8.169E-04	1.354E-01	5.404E-04	3.925E-02
2.000E+00	0.000E+00	2.838E+00	1.366E-01	2.720E-01	7.338E-02	1.126E-01
8.000E+00	0.000E+00	2.838E+00	1.011E-02	2.821E-01	1.989E-02	1.325E-01
2.400E+01	0.000E+00	2.838E+00	3.093E-03	2.852E-01	3.667E-03	1.362E-01
9.600E+01	0.000E+00	2.838E+00	2.900E-03	2.881E-01	2.861E-03	1.391E-01
	TOTAL	2.838E+00	TOTAL	2.881E-01	TOTAL	1.391E-01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	1.171E-01	1.171E-01
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.841E-02	1.355E-01
1.750E-02	1.036E+00	1.126E+00	4.942E-02	5.372E-02	1.557E+00	1.693E+00
4.300E-01	1.808E+00	2.935E+00	8.624E-02	1.400E-01	2.718E+00	4.411E+00
1.853E+00	1.238E-01	3.058E+00	5.902E-03	1.459E-01	1.860E-01	4.597E+00
1.980E+00	1.912E-02	3.077E+00	9.119E-04	1.468E-01	2.874E-02	4.626E+00
2.000E+00	0.000E+00	3.077E+00	1.681E-01	3.149E-01	3.123E+00	7.749E+00
8.000E+00	0.000E+00	3.077E+00	2.190E-02	3.368E-01	1.557E+00	9.306E+00
2.400E+01	0.000E+00	3.077E+00	9.807E-03	3.466E-01	7.163E-01	1.002E+01
9.600E+01	0.000E+00	3.077E+00	9.531E-03	3.561E-01	8.510E-01	1.087E+01
	TOTAL	3.077E+00	TOTAL	3.561E-01	TOTAL	1.087E+01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	4.459E-04	4.459E-04
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.565E-04	6.024E-04
1.750E-02	9.117E-01	1.002E+00	4.348E-02	4.778E-02	1.198E-01	1.204E-01
4.300E-01	1.373E+00	2.375E+00	6.548E-02	1.133E-01	8.615E-01	9.819E-01
1.853E+00	9.064E-02	2.465E+00	4.323E-03	1.176E-01	9.382E-02	1.076E+00
1.980E+00	1.398E-02	2.479E+00	6.668E-04	1.182E-01	1.470E-02	1.090E+00
2.000E+00	0.000E+00	2.479E+00	1.174E-01	2.357E-01	2.111E+00	3.202E+00
8.000E+00	0.000E+00	2.479E+00	1.370E-02	2.494E-01	9.454E-01	4.147E+00
2.400E+01	0.000E+00	2.479E+00	5.937E-03	2.553E-01	2.444E-01	4.392E+00
9.600E+01	0.000E+00	2.479E+00	6.498E-03	2.618E-01	2.251E-01	4.617E+00
	TOTAL	2.479E+00	TOTAL	2.618E-01	TOTAL	4.617E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	6.471E+00	6.471E+00
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.079E+00	7.550E+00
1.750E-02	1.180E+02	1.230E+02	5.628E+00	5.867E+00	1.774E+02	1.849E+02
4.300E-01	4.007E+02	5.238E+02	1.911E+01	2.498E+01	6.023E+02	7.872E+02
1.853E+00	3.532E+01	5.591E+02	1.684E+00	2.666E+01	5.308E+01	8.403E+02
1.980E+00	5.555E+00	5.646E+02	2.649E-01	2.693E+01	8.350E+00	8.487E+02
2.000E+00	0.000E+00	5.646E+02	7.617E+01	1.031E+02	1.415E+03	2.264E+03
8.000E+00	0.000E+00	5.646E+02	1.050E+01	1.136E+02	1.481E+03	3.745E+03
2.400E+01	0.000E+00	5.646E+02	1.484E+01	1.284E+02	1.622E+03	5.366E+03
9.600E+01	0.000E+00	5.646E+02	2.534E+01	1.538E+02	3.383E+03	8.750E+03
	TOTAL	5.646E+02	TOTAL	1.538E+02	TOTAL	8.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	3.823E-03	3.823E-03
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.369E-03	5.191E-03
1.750E-02	3.766E+01	4.268E+01	1.796E+00	2.036E+00	7.867E-01	7.919E-01
4.300E-01	3.502E+01	7.771E+01	1.670E+00	3.706E+00	1.956E+00	2.748E+00
1.853E+00	1.742E+00	7.945E+01	8.306E-02	3.789E+00	1.201E-01	2.868E+00
1.980E+00	2.690E-01	7.972E+01	1.283E-02	3.802E+00	1.735E-02	2.885E+00
2.000E+00	0.000E+00	7.972E+01	3.630E+00	7.432E+00	1.827E+00	4.713E+00
8.000E+00	0.000E+00	7.972E+01	4.937E-01	7.926E+00	1.881E+00	6.594E+00
2.400E+01	0.000E+00	7.972E+01	6.968E-01	8.623E+00	1.236E+00	7.830E+00
9.600E+01	0.000E+00	7.972E+01	1.189E+00	9.812E+00	1.721E+00	9.551E+00
	TOTAL	7.972E+01	TOTAL	9.812E+00	TOTAL	9.551E+00

PAGE 4

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.410E-01	1.410E-01
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	2.280E-02	1.637E-01
1.750E-02	1.796E+00	1.905E+00	8.564E-02	9.084E-02	2.699E+00	2.863E+00
4.300E-01	3.827E+00	5.732E+00	1.825E-01	2.734E-01	5.752E+00	8.615E+00
1.853E+00	2.633E-01	5.995E+00	1.256E-02	2.859E-01	3.957E-01	9.011E+00
1.980E+00	4.066E-02	6.035E+00	1.939E-03	2.878E-01	6.111E-02	9.072E+00
2.000E+00	0.000E+00	6.035E+00	3.380E-01	6.259E-01	6.280E+00	1.535E+01
8.000E+00	0.000E+00	6.035E+00	3.307E-02	6.589E-01	2.352E+00	1.770E+01
2.400E+01	0.000E+00	6.035E+00	1.257E-02	6.715E-01	9.182E-01	1.862E+01
9.600E+01	0.000E+00	6.035E+00	1.227E-02	6.838E-01	1.096E+00	1.972E+01
	TOTAL	6.035E+00	TOTAL	6.838E-01	TOTAL	1.972E-01

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.370E-05	1.370E-05
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	4.857E-06	1.855E-05
1.750E-02	1.347E-00	1.456E+00	6.425E-02	6.945E-02	5.464E-03	5.483E-03
4.300E-01	2.336E+00	3.793E+00	1.214E-01	1.809E-01	4.378E-02	4.926E-02
1.853E+00	1.552E-01	3.948E+00	7.401E-03	1.883E-01	4.813E-03	5.407E-02
1.980E+00	2.396E-02	3.972E+00	1.143E-03	1.894E-01	7.554E-04	5.483E-02
2.000E+00	0.000E+00	3.972E+00	1.919E-01	3.813E-01	1.031E-01	1.579E-01
8.000E+00	0.000E-00	3.972E+00	1.456E-02	3.959E-01	2.875E-02	1.867E-01
2.400E+01	0.000E+00	3.972E+00	4.763E-03	4.006E-01	5.701E-03	1.924E-01
9.600E+01	0.000E+00	3.972E+00	4.571E-03	4.052E-01	4.554E-03	1.969E-01
	TOTAL	3.972E+00	TOTAL	4.052E-01	TOTAL	1.969E-01

PAGE 5

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	2.580E-01	2.580E-01
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	4.121E-02	2.992E-01
1.750E-02	2.832E+00	3.031E+00	1.351E-01	1.446E-01	4.257E+00	4.556E+00
4.300E-01	5.635E+00	8.666E+00	2.688E-01	4.133E-01	8.470E+00	1.303E+01
1.853E+00	3.870E-01	9.053E+00	1.846E-02	4.318E-01	5.817E-01	1.361E+01
1.980E+00	5.978E-02	9.113E+00	2.851E-03	4.346E-01	8.985E-02	1.370E+01
2.000E+00	0.000E+00	9.113E+00	5.061E-01	9.407E-01	9.404E+00	2.310E+01
8.000E+00	0.000E+00	9.113E+00	5.497E-02	9.957E-01	3.909E+00	2.701E+01
2.400E+01	0.000E+00	9.113E+00	2.238E-02	1.018E+00	1.635E+00	2.864E+01
9.600E+01	0.000E+00	9.113E+00	2.180E-02	1.040E+00	1.947E+00	3.059E+01
	TOTAL	9.113E+00	TOTAL	1.040E+00	TOTAL	3.059E+01

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	4.596E-04	4.596E-04
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	1.614E-04	6.210E-04
1.750E-02	2.259E+00	2.458E+00	1.077E-01	1.172E-01	1.252E-01	1.259E-01
4.300E-01	3.709E+00	6.167E+00	1.769E-01	2.941E-01	9.053E-01	1.031E+00
1.853E+00	2.458E-01	6.413E+00	1.172E-02	3.059E-01	9.863E-02	1.130E+00
1.980E+00	3.794E-02	6.451E+00	1.809E-03	3.077E-01	1.546E-02	1.145E+00
2.000E+00	0.000E+00	6.451E+00	3.093E-01	6.170E-01	2.214E+00	3.360E+00
8.000E+00	0.000E+00	6.451E+00	2.826E-02	6.452E-01	9.741E-01	4.334E+00
2.400E+01	0.000E+00	6.451E+00	1.070E-02	6.559E-01	2.501E-01	4.584E+00
9.600E+01	0.000E+00	6.451E+00	1.107E-02	6.670E-01	2.296E-01	4.814E+00
	TOTAL	6.451E+00	TOTAL	6.670E-01	TOTAL	4.814E+00

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 6

Unit 2 MHA 100 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA1B.R5, MHA1B.RV5)

Input MHA1B.R5

```
'ICRP30A                                                                    '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)               '
' MHA1B.R5  UNIT 2 100 CFM INLEAKAGE '
'                                                                   '
 0, 0, 0, 1, 1
  1,  3
'RBSPRAY ', 'UNSPRAY'
 11
 3.087E+03, 1.000E+00
 .2500E+00, 1.000E+00
 .0000E+00, 1.000E+00
 .9100E+00, .0400E+00, .0500E+00
 1.000E+00, 0.000E+00, 0.000E+00
 1.332E+06, 3.831E+05, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.001E-02
'INITIAL FRACTION',0,0,0,0,2, 0.780E+00, 0.220E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.001E-02, 0.015E+00
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+02, 3.330E+02, 4.330E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 0.001E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 0.001E-03, 0.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.015E+00, 0.0175E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 4.465E+03, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.0175E+00, 0.43E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 3.970E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.430E+00, 1.853E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 4.240E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.853E+00, 1.980E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.980E+00, 2.000E+00
'REMOVAL RATE    ',1,1,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 2.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.050E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.050E+00, 4.465E+03, 0.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+02, 3.330E+02, 4.330E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 1.000E+02, 3.330E+02, 4.330E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output MHA1B.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   9: 4: 5

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)
  MHA1B.R5  UNIT 2 100 CFM INLEAKAGE
1                           TIME INDEPENDENT INPUT
                              CASE NUMBER   1


                                NODES  NSTEP
                                  2     11

                            OUTPUT CONTROL PARAMETER
                         I        1    2    3    4    5
                    IPRINT(I)     0    0    0    1    0

                    NUMBER OF DOSE EVALUATION POINTS -   3


                  POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                    3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          2.500E-01     1.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         2.500E-01     1.000E+00


                            ISOTOPIC SPLIT BY GROUP
                         ELEM.         ORG.          PART.
      HALOGENS       9.100E-01     4.000E-02     5.000E-02
                     1.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
           RBSPRAY       UNSPRAY
           1.332E+06     3.831E+05


                            CONTROL ROOM VOLUME (CU FT)
                                        4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
					91-E-0117-16	
0(3)	11/30/00	KLA	JL	ARKANSAS NUCLEAR ONE		
0(2)	10/10/00	JGM	MAM		PAGE NUMBER	Attachment 6
REV.	DATE	BY	CHK'D			3 OF 8

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.2822800E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	ORG.	1.0032000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	PART.	1.2540000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.4634600E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	ORG.	1.5224000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	PART.	1.9030000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.1160200E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	ORG.	2.2488000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	PART.	2.8110000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	5.9832500E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	ORG.	2.6300000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	PART.	3.2875000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	4.6437300E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	ORG.	2.0412000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	PART.	2.5515000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
KR 83M	ELEM.	4.1520000E+03	3.7260000E-01	1.270E-05	0.000E+00	0.000E+00	1.360E-04	0.000E+00
KR 85M	ELEM.	1.2970000E+04	1.5786000E-01	2.310E-02	4.970E-02	0.000E+00	3.200E-02	0.000E+00
KR 85	ELEM.	4.1020000E+02	7.3512000E-06	3.310E-04	4.840E-02	0.000E+00	4.750E-04	0.000E+00
KR 87	ELEM.	2.3350000E+04	5.4684000E-01	1.330E-01	3.360E-01	0.000E+00	1.850E-01	0.000E+00
KR 88	ELEM.	3.2000000E+04	2.4750000E-01	3.380E-01	7.760E-02	0.000E+00	4.690E-01	0.000E+00
KR 89	ELEM.	3.9790000E+04	1.3068000E+01	3.030E-01	3.470E-01	0.000E+00	4.210E-01	0.000E+00
XE 131M	ELEM.	2.5950000E+02	2.4048000E-03	1.250E-03	1.330E-02	0.000E+00	2.710E-03	0.000E+00
XE 133M	ELEM.	1.3840000E+03	1.2564000E-02	4.290E-03	2.960E-02	0.000E+00	7.000E-03	0.000E+00
XE 133	ELEM.	5.6220000E+04	5.4792000E-03	4.960E-03	9.670E-03	0.000E+00	7.890E-03	0.000E+00
XE 135M	ELEM.	1.5570000E+04	2.6640000E+00	6.370E-02	2.140E-02	0.000E+00	9.160E-02	0.000E+00
XE 135	ELEM.	5.3630000E+04	7.5311970E-02	3.590E-02	6.320E-02	0.000E+00	5.070E-02	0.000E+00
XE 137	ELEM.	5.1030000E+04	1.0659600E+01	2.830E-02	4.590E-01	0.000E+00	4.020E-02	0.000E+00
XE 138	ELEM.	4.7750000E+04	2.4465600E+00	1.870E-01	1.470E-01	0.000E+00	2.610E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

TIME INTERVAL	0	0	0	0	2	0.00000E-00	1.00000E-05
INITIAL FRACTION	0	0	0	0	2	7.80000E-01	2.20000E-01
TIME INTERVAL	0	0	0	0	2	1.00000E-05	1.50000E-02
CONTROL ROOM	0	0	0	0	5	1.00000E+02	3.33000E+02
4.33000E+02 1.66700E+03 1.00000E+00							
CR FILTER EFF	1	1	0	0	2	9.50000E+01	9.90000E+01
CR FILTER EFF	1	2	0	0	2	9.50000E+01	9.90000E+01
CR FILTER EFF	1	3	0	0	2	9.50000E+01	9.90000E+01
TRANSFER PERCENT	0	0	0	1	3	1.00000E-01	0.00000E+00
1.00000E-06							
TRANSFER PERCENT	0	0	0	2	3	1.00000E-01	1.00000E-06
0.00000E+00							
DOSE PARAMS	0	0	0	0	7	6.50000E-04	3.47000E-04
3.10000E-05 3.47000E-04 9.77000E-04 3.47000E-04 1.00000E-01							
TIME INTERVAL	0	0	0	0	2	1.50000E-02	1.75000E-02
TRANSFER PERCENT	0	0	0	1	3	1.00000E-01	0.00000E+00
1.28400E+03							
TRANSFER PERCENT	0	0	0	2	3	1.00000E-01	4.46500E+03
0.00000E+00							
TIME INTERVAL	0	0	0	0	2	1.75000E-02	4.30000E-01
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	3.97000E+00	0.00000E+00
TIME INTERVAL	0	0	0	0	2	4.30000E-01	1.85300E+00
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	4.24000E+00	0.00000E+00
TIME INTERVAL	0	0	0	0	2	1.85300E+00	1.98000E+00
REMOVAL RATE	1	1	0	0	2	2.00000E+01	0.00000E+00
REMOVAL RATE	1	2	0	0	2	0.00000E+00	0.00000E+00
REMOVAL RATE	1	3	0	0	2	4.24000E-01	0.00000E+00

```
TIME INTERVAL          0    0    0    0    2   1.98000E+00   2.00000E+00
REMOVAL RATE           1    1    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
TRANSFER PERCENT       0    0    0    1    3   5.00000E-02   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   5.00000E-02   4.46500E+03
 0.00000E+00
CONTROL ROOM           0    0    0    0    5   1.00000E+02   3.33000E+02
 4.33000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   1.00000E+02   3.33000E+02
 4.33000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```


SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.004E-01	1.004E-01
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	1.624E-02	1.167E-01
1.750E-02	1.277E+00	1.354E+00	6.089E-02	6.459E-02	1.919E+00	2.036E+00
4.300E-01	2.717E+00	4.072E+00	1.296E-01	1.942E-01	4.084E+00	6.120E+00
1.853E+00	1.868E-01	4.259E+00	8.911E-03	2.031E-01	2.808E-01	6.401E+00
1.980E+00	2.886E-02	4.287E+00	1.376E-03	2.045E-01	4.337E-02	6.444E+00
2.000E+00	0.000E+00	4.287E+00	2.392E-01	4.437E-01	4.445E+00	1.089E+01
8.000E+00	0.000E+00	4.287E+00	2.310E-02	4.668E-01	1.642E+00	1.253E+01
2.400E+01	0.000E+00	4.287E+00	8.559E-03	4.754E-01	6.252E-01	1.316E+01
9.600E+01	0.000E+00	4.287E+00	8.313E-03	4.837E-01	7.422E-01	1.390E+01
	TOTAL	4.287E+00	TOTAL	4.837E-01	TOTAL	1.390E+01

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.149E-05	1.149E-05
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	4.074E-06	1.556E-05
1.750E-02	9.619E-01	1.039E+00	4.587E-02	4.957E-02	4.456E-03	4.471E-03
4.300E-01	1.671E+00	2.710E+00	7.969E-02	1.293E-01	3.423E-02	3.871E-02
1.853E+00	1.109E-01	2.821E+00	5.291E-03	1.346E-01	3.693E-03	4.240E-02
1.980E+00	1.713E-02	2.838E+00	8.169E-04	1.354E-01	5.782E-04	4.298E-02
2.000E+00	0.000E+00	2.838E+00	1.366E-01	2.720E-01	7.426E-02	1.172E-01
8.000E+00	0.000E+00	2.838E+00	1.011E-02	2.821E-01	1.942E-02	1.367E-01
2.400E+01	0.000E+00	2.838E+00	3.093E-03	2.852E-01	3.690E-03	1.403E-01
9.600E+01	0.000E+00	2.838E+00	2.900E-03	2.881E-01	2.872E-03	1.432E-01
	TOTAL	2.838E+00	TOTAL	2.881E-01	TOTAL	1.432E-01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	1.171E-01	1.171E-01
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.841E-02	1.355E-01
1.750E-02	1.036E+00	1.126E+00	4.942E-02	5.372E-02	1.557E+00	1.693E+00
4.300E-01	1.808E+00	2.935E+00	8.624E-02	1.400E-01	2.718E+00	4.411E+00
1.853E+00	1.238E-01	3.058E+00	5.902E-03	1.459E-01	1.860E-01	4.597E+00
1.980E+00	1.912E-02	3.077E+00	9.119E-04	1.468E-01	2.874E-02	4.626E+00
2.000E+00	0.000E+00	3.077E+00	1.681E-01	3.149E-01	3.123E+00	7.749E+00
8.000E+00	0.000E+00	3.077E+00	2.190E-02	3.368E-01	1.557E+00	9.306E+00
2.400E+01	0.000E+00	3.077E+00	9.807E-03	3.466E-01	7.163E-01	1.002E+01
9.600E+01	0.000E+00	3.077E+00	9.531E-03	3.561E-01	8.510E-01	1.087E+01
	TOTAL	3.077E+00	TOTAL	3.561E-01	TOTAL	1.087E+01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	5.091E-04	5.091E-04
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.787E-04	6.879E-04
1.750E-02	9.117E-01	1.002E+00	4.348E-02	4.778E-02	1.351E-01	1.358E-01
4.300E-01	1.373E+00	2.375E+00	6.548E-02	1.133E-01	9.394E-01	1.075E+00
1.853E+00	9.064E-02	2.465E+00	4.323E-03	1.176E-01	1.005E-01	1.176E+00
1.980E+00	1.398E-02	2.479E+00	6.668E-04	1.182E-01	1.571E-02	1.191E+00
2.000E+00	0.000E+00	2.479E+00	1.174E-01	2.357E-01	2.136E+00	3.327E+00
8.000E+00	0.000E+00	2.479E+00	1.370E-02	2.494E-01	9.245E-01	4.251E+00
2.400E+01	0.000E+00	2.479E+00	5.937E-03	2.553E-01	2.454E-01	4.497E+00
9.600E+01	0.000E+00	2.479E+00	6.498E-03	2.618E-01	2.254E-01	4.722E+00
	TOTAL	2.479E+00	TOTAL	2.618E-01	TOTAL	4.722E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	6.471E+00	6.471E+00
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.079E+00	7.550E+00
1.750E-02	1.180E+02	1.230E+02	5.628E+00	5.867E+00	1.774E+02	1.849E+02
4.300E-01	4.007E+02	5.238E+02	1.911E+01	2.498E+01	6.023E+02	7.872E+02
1.853E+00	3.532E+01	5.591E+02	1.684E+00	2.666E+01	5.308E+01	8.403E+02
1.980E+00	5.555E+00	5.646E+02	2.649E-01	2.693E+01	8.350E+00	8.487E+02
2.000E+00	0.000E+00	5.646E+02	7.617E+01	1.031E+02	1.415E+03	2.264E+03
8.000E+00	0.000E+00	5.646E+02	1.050E+01	1.136E+02	1.481E+03	3.745E+03
2.400E+01	0.000E+00	5.646E+02	1.484E+01	1.284E+02	1.622E+03	5.366E+03
9.600E+01	0.000E+00	5.646E+02	2.534E+01	1.538E+02	3.383E+03	8.750E+03
	TOTAL	5.646E+02	TOTAL	1.538E+02	TOTAL	8.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	7.404E-03	7.404E-03
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	2.650E-03	1.005E-02
1.750E-02	3.766E+01	4.268E+01	1.796E+00	2.036E+00	1.510E+00	1.520E+00
4.300E-01	3.502E+01	7.771E+01	1.670E+00	3.706E+00	3.683E+00	5.203E+00
1.853E+00	1.742E+00	7.945E+01	8.306E-02	3.789E+00	2.261E-01	5.429E+00
1.980E+00	2.690E-01	7.972E+01	1.283E-02	3.802E+00	3.261E-02	5.462E+00
2.000E+00	0.000E+00	7.972E+01	3.630E+00	7.432E+00	3.451E+00	8.913E+00
8.000E+00	0.000E+00	7.972E+01	4.937E-01	7.926E+00	3.555E+00	1.247E+01
2.400E+01	0.000E+00	7.972E+01	6.968E-01	8.623E+00	2.336E+00	1.480E+01
9.600E+01	0.000E+00	7.972E+01	1.189E+00	9.812E+00	3.251E+00	1.805E+01
	TOTAL	7.972E+01	TOTAL	9.812E+00	TOTAL	1.805E+01

PAGE 4

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.410E-01	1.410E-01
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	2.280E-02	1.637E-01
1.750E-02	1.796E+00	1.905E+00	8.564E-02	9.084E-02	2.699E+00	2.863E+00
4.300E-01	3.827E+00	5.732E+00	1.825E-01	2.734E-01	5.752E+00	8.615E+00
1.853E+00	2.633E-01	5.995E+00	1.256E-02	2.859E-01	3.957E-01	9.011E+00
1.980E+00	4.066E-02	6.035E+00	1.939E-03	2.878E-01	6.111E-02	9.072E+00
2.000E+00	0.000E+00	6.035E+00	3.380E-01	6.259E-01	6.280E+00	1.535E+01
8.000E+00	0.000E+00	6.035E+00	3.307E-02	6.589E-01	2.352E+00	1.770E+01
2.400E+01	0.000E+00	6.035E+00	1.257E-02	6.715E-01	9.182E-01	1.862E+01
9.600E+01	0.000E+00	6.035E+00	1.227E-02	6.838E-01	1.096E+00	1.972E+01
	TOTAL	6.035E+00	TOTAL	6.838E-01	TOTAL	1.972E+01

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.606E-05	1.606E-05
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	5.696E-06	2.176E-05
1.750E-02	1.347E+00	1.456E+00	6.425E-02	6.945E-02	6.226E-03	6.248E-03
4.300E-01	2.336E+00	3.793E+00	1.114E-01	1.809E-01	4.783E-02	5.408E-02
1.853E+00	1.552E-01	3.948E+00	7.401E-03	1.883E-01	5.162E-03	5.924E-02
1.980E+00	2.396E-02	3.972E+00	1.143E-03	1.894E-01	8.082E-04	6.005E-02
2.000E+00	0.000E+00	3.972E+00	1.919E-01	3.813E-01	1.043E-01	1.644E-01
8.000E+00	0.000E+00	3.972E+00	1.456E-02	3.959E-01	2.807E-02	1.924E-01
2.400E+01	0.000E+00	3.972E+00	4.763E-03	4.006E-01	5.733E-03	1.982E-01
9.600E+01	0.000E+00	3.972E+00	4.571E-03	4.052E-01	4.569E-03	2.027E-01
	TOTAL	3.972E+00	TOTAL	4.052E-01	TOTAL	2.027E-01

PAGE 5

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	2.580E-01	2.580E-01
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	4.121E-02	2.992E-01
1.750E-02	2.832E+00	3.031E+00	1.351E-01	1.446E-01	4.257E+00	4.556E+00
4.300E-01	5.635E+00	8.666E+00	2.688E-01	4.133E-01	8.470E+00	1.303E+01
1.853E+00	3.870E-01	9.053E+00	1.846E-02	4.318E-01	5.817E-01	1.361E+01
1.980E+00	5.978E-02	9.113E+00	2.851E-03	4.346E-01	8.985E-02	1.370E+01
2.000E+00	0.000E+00	9.113E+00	5.061E-01	9.407E-01	9.404E+00	2.310E+01
8.000E+00	0.000E+00	9.113E+00	5.497E-02	9.957E-01	3.909E+00	2.701E+01
2.400E+01	0.000E+00	9.113E+00	2.238E-02	1.018E+00	1.635E+00	2.864E+01
9.600E+01	0.000E+00	9.113E+00	2.180E-02	1.040E+00	1.947E+00	3.059E+01
	TOTAL	9.113E+00	TOTAL	1.040E+00	TOTAL	3.059E+01

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	5.252E-04	5.252E-04
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	1.844E-04	7.096E-04
1.750E-02	2.259E+00	2.458E+00	1.077E-01	1.172E-01	1.414E-01	1.421E-01
4.300E-01	3.709E+00	6.167E+00	1.769E-01	2.941E-01	9.872E-01	1.129E+00
1.853E+00	2.458E-01	6.413E+00	1.172E-02	3.059E-01	1.057E-01	1.235E+00
1.980E+00	3.794E-02	6.451E+00	1.809E-03	3.077E-01	1.652E-02	1.251E+00
2.000E+00	0.000E+00	6.451E+00	3.093E-01	6.170E-01	2.240E+00	3.491E+00
8.000E+00	0.000E+00	6.451E+00	2.826E-02	6.452E-01	9.525E-01	4.444E+00
2.400E+01	0.000E+00	6.451E+00	1.070E-02	6.559E-01	2.512E-01	4.695E+00
9.600E+01	0.000E+00	6.451E+00	1.107E-02	6.670E-01	2.300E-01	4.925E+00
	TOTAL	6.451E+00	TOTAL	6.670E-01	TOTAL	4.925E+00

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 7

Unit 2 MHA 250 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA1C.R5, MHA1C.RV5)

Input - MHA1C.R5

```
'ICRP30A                                                                    '
'TILTAPE   ','TIMTAPE   ','TINTAPE   '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)               '
' MHA1C.R5  UNIT 2 250 CFM INLEAKAGE '
'                                                                           '
 0, 0, 0, 1, 0
  2,  3
'RBSPRAY ', 'UNSPRAY'
 11
 3.087E+03, 0.000E+00
 .2500E+00, 1.000E+00
 .0000E+00, 0.000E+00
 .9100E+00, .0400E+00, .0500E+00
 1.000E+00, 0.000E+00, 0.000E+00
 1.332E+06, 3.831E+05, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.001E-02
'INITIAL FRACTION',0,0,0,0,2, 0.780E+00, 0.220E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.001E-02, 0.015E+00
'CONTROL ROOM    ',0,0,0,0,5, 2.500E+02, 3.330E+02, 5.830E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 0.001E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 0.001E-03, 0.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.015E+00, 0.0175E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 1.284E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 4.465E+03, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.0175E+00, 0.43E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 3.970E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.430E+00, 1.853E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 4.240E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.853E+00, 1.980E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.980E+00, 2.000E+00
'REMOVAL RATE    ',1,1,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 1.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.050E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.050E+00, 4.465E+03, 0.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 2.500E+02, 3.330E+02, 5.830E+02, 1.667E-03, 1.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 2.500E+02, 3.330E+02, 5.830E+02, 1.667E-03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00
```

Output - MHA1C.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME   9: 5:40

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)
  MHA1C.R5  UNIT 2 250 CFM INLEAKAGE
1                           TIME INDEPENDENT INPUT
                              CASE NUMBER   1


                                NODES  NSTEP
                                  2     11

                            OUTPUT CONTROL PARAMETER
                        I        1    2    3    4    5
                   IPRINT(I)     0    0    0    1    0

                   NUMBER OF DOSE EVALUATION POINTS -   3


                  POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          2.500E-01     1.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         2.500E-01     1.000E+00


                            ISOTOPIC SPLIT BY GROUP
                        ELEM.         ORG.          PART.
      HALOGENS       9.100E-01     4.000E-02     5.000E-02
                     1.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
           RBSPRAY       UNSPRAY
           1.332E+06     3.831E+05


                            CONTROL ROOM VOLUME (CU FT)
                                        4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
					91-E-0117-16	
0(3)	11/30/00	KLA	JL	ARKANSAS NUCLEAR ONE		
0(2)	10/10/00	JGM	MAM		PAGE NUMBER	Attachment 7
REV.	DATE	BY	CHK'D			3 OF 8

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.2822800E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	ORG.	1.0032000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	PART.	1.2540000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.4634600E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	ORG.	1.5224000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	PART.	1.9030000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.1160200E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	ORG.	2.2488000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	PART.	2.8110000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	5.9832500E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	ORG.	2.6300000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	PART.	3.2875000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	4.6437300E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	ORG.	2.0412000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	PART.	2.5515000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
KR 83M	ELEM.	4.1520000E+03	3.7260000E-01	1.270E-05	0.000E+00	0.000E+00	1.360E-04	0.000E+00
KR 85M	ELEM.	1.2970000E+04	1.5736000E-01	2.310E-02	4.970E-02	0.000E+00	3.200E-02	0.000E+00
KR 85	ELEM.	4.1020000E+02	7.3512000E-06	3.310E-04	4.840E-02	0.000E+00	4.750E-04	0.000E+00
KR 87	ELEM.	2.3350000E+04	5.4684000E-01	1.330E-01	3.360E-01	0.000E+00	1.850E-01	0.000E+00
KR 88	ELEM.	3.2000000E+04	2.4750000E-01	3.380E-01	7.760E-02	0.000E+00	4.690E-01	0.000E+00
KR 89	ELEM.	3.9790000E+04	1.3368000E+01	3.030E-01	3.470E-01	0.000E+00	4.210E-01	0.000E+00
XE 131M	ELEM.	2.5950000E+02	2.4048000E-03	1.250E-03	1.330E-02	0.000E+00	2.710E-03	0.000E+00
XE 133M	ELEM.	1.3840000E+03	1.2564000E-02	4.290E-03	2.960E-02	0.000E+00	7.000E-03	0.000E+00
XE 133	ELEM.	5.6220000E+04	5.4791000E-03	4.960E-03	9.670E-03	0.000E+00	7.890E-03	0.000E+00
XE 135M	ELEM.	1.5570000E+04	2.8640000E+00	6.370E-02	2.140E-02	0.000E+00	9.160E-02	0.000E+00
XE 135	ELEM.	5.3630000E+04	7.5311970E-02	3.590E-02	6.320E-02	0.000E+00	5.070E-02	0.000E+00
XE 137	ELEM.	5.1030000E+04	1.0659600E+01	2.830E-02	4.590E-01	0.000E+00	4.020E-02	0.000E+00
XE 138	ELEM.	4.7750000E+04	2.4465600E+00	1.870E-01	1.470E-01	0.000E+00	2.610E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    1    0    2   0.00000E+00   1.00000E-05
INITIAL FRACTION       0    0    1    0    2   7.80000E-01   2.20000E-01
TIME INTERVAL          0    0    1    0    2   1.00000E-05   1.50000E-02
CONTROL ROOM           0    0    1    0    5   2.50000E+02   3.33000E+02
 5.83000E+02   1.66700E+03   1.00000E+00
CR FILTER EFF          1    1    1    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    1    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    1    0    2   9.50000E+01   9.90000E+01
TRANSFER PERCENT       0    0    1    1    3   1.00000E-01   0.00000E+00
 1.00000E-06
TRANSFER PERCENT       0    0    1    2    3   1.00000E-01   1.00000E-06
 0.00000E+00
DOSE PARAMS            0    0    1    0    7   6.50000E-04   3.47000E-04
 3.10000E-05   3.47000E-04   8.77000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    1    0    2   1.50000E-02   1.75000E-02
TRANSFER PERCENT       0    0    1    1    3   1.00000E-01   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    1    2    3   1.00000E-01   4.46500E+03
 0.00000E+00
TIME INTERVAL          0    0    1    0    2   1.75000E-02   4.30000E-01
REMOVAL RATE           1    1    1    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    1    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    1    0    2   3.97000E+00   0.00000E+00
TIME INTERVAL          0    0    1    0    2   4.30000E-01   1.85300E+00
REMOVAL RATE           1    1    1    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    1    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    1    0    2   4.24000E-00   0.00000E+00
TIME INTERVAL          0    0    1    0    2   1.85300E-00   1.98000E+00
REMOVAL RATE           1    1    1    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    1    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    1    0    2   4.24000E-01   0.00000E+00
```

```
TIME INTERVAL          0    0    0    0    2   1.98000E+00   2.00000E+00
REMOVAL RATE           1    1    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
TRANSFER PERCENT       0    0    0    1    3   5.00000E-02   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   5.00000E-02   4.46500E+03
 1.00000E+00
CONTROL ROOM           0    0    0    0    5   2.50000E+02   3.33000E+02
 5.83000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   2.50000E+02   3.33000E+02
 5.83000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.004E-01	1.004E-01
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	1.624E-02	1.167E-01
1.750E-02	1.277E+00	1.354E+00	6.089E-02	6.459E-02	1.919E+00	2.036E+00
4.300E-01	2.717E+00	4.072E+00	1.296E-01	1.942E-01	4.084E+00	6.120E+00
1.853E-00	1.868E-01	4.259E+00	8.911E-03	2.031E-01	2.808E-01	6.401E+00
1.980E+00	2.886E-02	4.287E+00	1.376E-03	2.045E-01	4.337E-02	6.444E+00
2.000E+00	0.000E+00	4.287E+00	2.392E-01	4.437E-01	4.445E+00	1.089E+01
8.000E+00	0.000E+00	4.287E+00	2.310E-02	4.668E-01	1.642E+00	1.253E+01
2.400E+01	0.000E+00	4.287E+00	8.559E-03	4.754E-01	6.252E-01	1.316E+01
9.600E+01	0.000E+00	4.287E+00	8.313E-03	4.837E-01	7.422E-01	1.390E+01
	TOTAL	4.287E+00	TOTAL	4.837E-01	TOTAL	1.390E+01

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.654E-05	1.654E-05
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	5.863E-06	2.240E-05
1.750E-02	9.619E-01	1.039E+00	4.587E-02	4.957E-02	6.026E-03	6.048E-03
4.300E-01	1.671E+00	2.710E+00	7.969E-02	1.293E-01	4.163E-02	4.768E-02
1.853E+00	1.109E-01	2.821E+00	5.291E-03	1.346E-01	4.276E-03	5.196E-02
1.980E+00	1.713E-02	2.838E+00	8.169E-04	1.354E-01	6.652E-04	5.262E-02
2.000E+00	0.000E+00	2.838E+00	1.366E-01	2.720E-01	7.451E-02	1.271E-01
8.000E+00	0.000E+00	2.838E+00	1.011E-02	2.821E-01	1.897E-02	1.461E-01
2.400E+01	0.000E+00	2.838E+00	3.093E-03	2.852E-01	3.742E-03	1.499E-01
9.600E+01	0.000E+00	2.838E+00	2.900E-03	2.881E-01	2.897E-03	1.527E-01
	TOTAL	2.838E+00	TOTAL	2.881E-01	TOTAL	1.527E-01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	1.171E-01	1.171E-01
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.841E-02	1.355E-01
1.750E-02	1.036E+00	1.126E+00	4.942E-02	5.372E-02	1.557E+00	1.693E+00
4.300E-01	1.808E+00	2.935E+00	8.624E-02	1.400E-01	2.718E+00	4.411E+00
1.853E+00	1.238E-01	3.058E+00	5.902E-03	1.459E-01	1.860E-01	4.597E+00
1.980E+00	1.912E-02	3.077E+00	9.119E-04	1.468E-01	2.874E-02	4.626E+00
2.000E+00	0.000E+00	3.077E+00	1.681E-01	3.149E-01	3.123E+00	7.749E+00
8.000E+00	0.000E+00	3.077E+00	2.190E-02	3.368E-01	1.557E+00	9.306E+00
2.400E+01	0.000E+00	3.077E+00	9.807E-03	3.466E-01	7.163E-01	1.002E+01
9.600E+01	0.000E+00	3.077E+00	9.531E-03	3.561E-01	8.510E-01	1.087E+01
	TOTAL	3.077E+00	TOTAL	3.561E-01	TOTAL	1.087E+01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	6.985E-04	6.985E-04
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	2.451E-04	9.437E-04
1.750E-02	9.117E-01	1.002E+00	4.348E-02	4.778E-02	1.796E-01	1.805E-01
4.300E-01	1.373E+00	2.375E+00	6.548E-02	1.133E-01	1.138E+00	1.318E+00
1.853E+00	9.064E-02	2.465E+00	4.323E-03	1.176E-01	1.162E-01	1.435E+00
1.980E+00	1.398E-02	2.479E+00	6.668E-04	1.182E-01	1.805E-02	1.453E+00
2.000E+00	0.000E+00	2.479E+00	1.174E-01	2.357E-01	2.143E+00	3.596E+00
8.000E+00	0.000E+00	2.479E+00	1.370E-02	2.494E-01	9.010E-01	4.497E+00
2.400E+01	0.000E+00	2.479E+00	5.937E-03	2.553E-01	2.476E-01	4.745E+00
9.600E+01	0.000E+00	2.479E+00	6.498E-03	2.618E-01	2.262E-01	4.971E+00
	TOTAL	2.479E+00	TOTAL	2.618E-01	TOTAL	4.971E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	6.471E+00	6.471E+00
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.079E+00	7.550E+00
1.750E-02	1.180E+02	1.230E+02	5.628E+00	5.867E+00	1.774E+02	1.849E+02
4.300E-01	4.007E+02	5.238E+02	1.911E+01	2.498E+01	6.023E+02	7.872E+02
1.853E+00	3.532E+01	5.591E+02	1.684E+00	2.666E+01	5.308E+01	8.403E+02
1.980E+00	5.555E+00	5.646E+02	2.649E-01	2.693E+01	8.350E+00	8.487E+02
2.000E+00	0.000E+00	5.646E+02	7.617E+01	1.031E+02	1.415E+03	2.264E+03
8.000E+00	0.000E+00	5.646E+02	1.050E+01	1.136E+02	1.481E+03	3.745E+03
2.400E+01	0.000E+00	5.646E+02	1.484E+01	1.284E+02	1.622E+03	5.366E+03
9.600E+01	0.000E+00	5.646E+02	2.534E+01	1.538E+02	3.383E+03	8.750E+03
	TOTAL	5.646E-02	TOTAL	1.538E+02	TOTAL	8.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	1.813E-02	1.813E-02
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	6.486E-03	2.462E-02
1.750E-02	3.766E+01	4.268E+01	1.796E+00	2.036E+00	3.604E+00	3.629E+00
4.300E-01	3.502E+01	7.771E+01	1.670E+00	3.706E+00	8.302E+00	1.193E+01
1.853E+00	1.742E+00	7.945E+01	8.306E-02	3.789E+00	5.109E-01	1.244E+01
1.980E+00	2.690E-01	7.972E+01	1.283E-02	3.802E+00	7.331E-02	1.251E+01
2.000E+00	0.000E+00	7.972E+01	3.630E+00	7.432E+00	7.867E+00	2.038E+01
8.000E+00	0.000E+00	7.972E+01	4.937E-01	7.926E+00	8.114E+00	2.850E+01
2.400E+01	0.000E+00	7.972E+01	6.968E-01	8.623E+00	5.331E+00	3.383E+01
9.600E+01	0.000E+00	7.972E+01	1.189E+00	9.812E+00	7.420E+00	4.125E+01
	TOTAL	7.972E+01	TOTAL	9.812E+00	TOTAL	4.125E+01

PAGE 4

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.410E-01	1.410E-01
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	2.280E-02	1.637E-01
1.750E-02	1.796E+00	1.905E+00	8.564E-02	9.084E-02	2.699E+00	2.863E+00
4.300E-01	3.827E+00	5.732E+00	1.825E-01	2.734E-01	5.752E+00	8.615E+00
1.853E+00	2.633E-01	5.995E+00	1.256E-02	2.859E-01	3.957E-01	9.011E+00
1.980E+00	4.066E-02	6.035E+00	1.939E-03	2.878E-01	6.111E-02	9.072E+00
2.000E+00	0.000E+00	6.035E+00	3.380E-01	6.259E-01	6.280E+00	1.535E+01
8.000E+00	0.000E+00	6.035E+00	3.307E-02	6.589E-01	2.352E+00	1.770E+01
2.400E+01	0.000E+00	6.035E+00	1.257E-02	6.715E-01	9.182E-01	1.862E+01
9.600E+01	0.000E+00	6.035E+00	1.227E-02	6.838E-01	1.096E+00	1.972E+01
	TOTAL	6.035E+00	TOTAL	6.838E-01	TOTAL	1.972E+01

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	2.314E-05	2.314E-05
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	8.206E-06	3.135E-05
1.750E-02	1.347E+00	1.456E+00	6.425E-02	6.945E-02	8.425E-03	8.457E-03
4.300E-01	2.336E+00	3.793E+00	1.114E-01	1.809E-01	5.818E-02	6.663E-02
1.853E+00	1.552E-01	3.948E+00	7.401E-03	1.883E-01	5.977E-03	7.261E-02
1.980E+00	2.396E-02	3.972E+00	1.143E-03	1.894E-01	9.298E-04	7.354E-02
2.000E+00	0.000E+00	3.972E+00	1.919E-01	3.813E-01	1.047E-01	1.782E-01
8.000E+00	0.000E+00	3.972E+00	1.456E-02	3.959E-01	2.743E-02	2.057E-01
2.400E+01	0.000E+00	3.972E+00	4.763E-03	4.006E-01	5.808E-03	2.115E-01
9.600E+01	0.000E+00	3.972E+00	4.571E-03	4.052E-01	4.606E-03	2.161E-01
	TOTAL	3.972E+00	TOTAL	4.052E-01	TOTAL	2.161E-01

PAGE 5

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	2.580E-01	2.580E-01
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	4.121E-02	2.992E-01
1.750E-02	2.832E+00	3.031E+00	1.351E-01	1.446E-01	4.257E+00	4.556E+00
4.300E-01	5.635E+00	8.666E+00	2.688E-01	4.133E-01	8.470E+00	1.303E+01
1.853E+00	3.870E-01	9.053E+00	1.846E-02	4.318E-01	5.817E-01	1.361E+01
1.980E+00	5.978E-02	9.113E+00	2.851E-03	4.346E-01	8.985E-02	1.370E+01
2.000E+00	0.000E+00	9.113E+00	5.061E-01	9.407E-01	9.404E+00	2.310E+01
8.000E+00	0.000E+00	9.113E+00	5.497E-02	9.957E-01	3.909E+00	2.701E+01
2.400E+01	0.000E+00	9.113E+00	2.238E-02	1.018E+00	1.635E+00	2.864E+01
8.600E+01	0.000E+00	9.113E+00	2.180E-02	1.040E+00	1.947E+00	3.059E+01
	TOTAL	9.113E+00	TOTAL	1.040E+00	TOTAL	3.059E+01

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	7.217E-04	7.217E-04
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	2.534E-04	9.750E-04
1.750E-02	2.259E+00	2.458E+00	1.077E-01	1.172E-01	1.880E-01	1.890E-01
4.300E-01	3.709E+00	6.167E+00	1.769E-01	2.941E-01	1.196E+00	1.385E+00
1.853E+00	2.458E-01	6.413E+00	1.172E-02	3.059E-01	1.222E-01	1.507E+00
1.980E+00	3.794E-02	6.451E+00	1.809E-03	3.077E-01	1.898E-02	1.526E+00
2.000E+00	0.000E+00	6.451E+00	3.093E-01	6.170E-01	2.248E+00	3.774E+00
8.000E+00	0.000E+00	6.451E+00	2.826E-02	6.452E-01	9.284E-01	4.703E+00
2.400E+01	0.000E+00	6.451E+00	1.070E-02	6.559E-01	2.534E-01	4.956E+00
8.600E+01	0.000E+00	6.451E+00	1.107E-02	6.670E-01	2.308E-01	5.187E+00
	TOTAL	6.451E+00	TOTAL	6.670E-01	TOTAL	5.187E+00

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 8

Unit 2 MHA 61 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA1D.R5, MHA1D.RV5)

Input - MHA1D.R5

```
'ICRP30A                                                                    '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)               '
' MHA1DC.R5  UNIT 2 61 CFM INLEAKAGE '
'                                                                           '
 0, 0, 0, 1, 0
  2,  3
'RBSPRAY ', 'UNSPRAY'
 11
 3.087E+03, 0.000E+00
 .2500E+00, 1.000E+00
 .0000E+00, 0.000E+00
 .9100E+00, .0400E+00, .0500E+00
 1.000E+00, 0.000E+00, 0.000E+00
 1.332E+06, 3.831E+05, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.001E-02
'INITIAL FRACTION',0,0,0,0,2, 0.780E+00, 0.220E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.001E-02, 0.015E+00
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 0.001E-03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 0.001E-03, 0.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.015E+00, 0.0175E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.100E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.100E+00, 4.465E+03, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.0175E+00, 0.43E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 3.970E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.430E+00, 1.853E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 4.240E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.853E+00, 1.980E+00
'REMOVAL RATE    ',1,1,0,0,2, 20.00E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 1.980E+00, 2.000E+00
'REMOVAL RATE    ',1,1,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,2,0,0,2, 0.000E+00, 0.000E+00
'REMOVAL RATE    ',1,3,0,0,2, 0.424E+00, 0.000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 8.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 2.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'TRANSFER PERCENT',0,0,0,1,3, 0.050E+00, 0.000E+00, 1.284E+03
'TRANSFER PERCENT',0,0,0,2,3, 0.050E+00, 4.465E+03, 0.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 1.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output - MHA1D.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME  10:44:14

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA  (TRANSACT)
  MHA1DC.R5  UNIT 2 61 CFM INLEAKAGE
1                            TIME INDEPENDENT INPUT
                               CASE NUMBER   1


                                 NODES  NSTEP
                                   2     11

                             OUTPUT CONTROL PARAMETER
                         I        1    2    3    4    5
                    IPRINT(I)     0    0    0    1    0

                    NUMBER OF DOSE EVALUATION POINTS -   3


                  POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                    3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          2.500E-01     1.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         2.500E-01     1.000E+00


                             ISOTOPIC SPLIT BY GROUP
                         ELEM.         ORG.          PART.
      HALOGENS       9.100E-01     4.000E-02     5.000E-02
                     1.000E+00     0.000E+00     0.000E+00


                             VOLUME OF NODES (CU FT)
           RBSPRAY       UNSPRAY
           1.332E+06     3.831E+05


                             CONTROL ROOM VOLUME (CU FT)
                                        4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
					91-E-0117-16	
0(3)	11/30/00	KLA	JL	ARKANSAS NUCLEAR ONE		
0(2)	10/10/00	JGM	MAM		PAGE NUMBER	Attachment 8
REV.	DATE	BY	CHK'D			3 OF 8

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.2822800E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	ORG.	1.0032000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 131	PART.	1.2540000E+03	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.4634600E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	ORG.	1.5224000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 132	PART.	1.9030000E+03	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.1160200E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	ORG.	2.2488000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 133	PART.	2.8110000E+03	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	5.9832500E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	ORG.	2.6300000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 134	PART.	3.2875000E+03	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	4.6437300E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	ORG.	2.0412000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
I 135	PART.	2.5515000E+03	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00
KR 83M	ELEM.	4.1520000E+03	3.7260000E-01	1.270E-05	0.000E+00	0.000E+00	1.360E-04	0.000E+00
KR 85M	ELEM.	1.2970000E+04	1.5786000E-01	2.310E-02	4.970E-02	0.000E+00	3.200E-02	0.000E+00
KR 85	ELEM.	4.1020000E+02	7.3512000E-06	3.310E-04	4.840E-02	0.000E+00	4.750E-04	0.000E+00
KR 87	ELEM.	2.3350000E+04	5.4684000E-01	1.330E-01	3.360E-01	0.000E+00	1.850E-01	0.000E+00
KR 88	ELEM.	3.2000000E+04	2.4750000E-01	3.380E-01	7.760E-02	0.000E+00	4.690E-01	0.000E+00
KR 89	ELEM.	3.9790000E+04	1.3068000E+01	3.030E-01	3.470E-01	0.000E+00	4.210E-01	0.000E+00
XE 131M	ELEM.	2.5950000E+02	2.4048000E-03	1.250E-03	1.330E-02	0.000E+00	2.710E-03	0.000E+00
XE 133M	ELEM.	1.3840000E+03	1.2564000E-02	4.290E-03	2.960E-02	0.000E+00	7.000E-03	0.000E+00
XE 133	ELEM.	5.6220000E+04	5.4790000E-03	4.960E-03	9.670E-03	0.000E+00	7.890E-03	0.000E+00
XE 135M	ELEM.	1.5570000E+04	2.6640000E+00	6.370E-02	1.140E-02	0.000E+00	9.160E-02	0.000E+00
XE 135	ELEM.	5.3630000E+04	7.5311970E-02	3.590E-02	6.320E-02	0.000E+00	5.070E-02	0.000E+00
XE 137	ELEM.	5.1030000E+04	1.0659600E-01	2.830E-02	4.590E-01	0.000E+00	4.020E-02	0.000E+00
XE 138	ELEM.	4.7750000E+04	2.4465600E+00	1.870E-01	1.470E-01	0.000E+00	2.610E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   1.00000E-05
INITIAL FRACTION       0    0    0    0    2   7.80000E-01   2.20000E-01
TIME INTERVAL          0    0    0    0    2   1.00000E-05   1.50000E-02
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
TRANSFER PERCENT       0    0    0    1    3   1.00000E-01   0.00000E+00
 1.00000E-06
TRANSFER PERCENT       0    0    0    2    3   1.00000E-01   1.00000E-06
 0.00000E+00
DOSE PARAMS            0    0    0    0    7   6.50000E-04   3.47000E-04
 3.10000E-05   3.47000E-04   9.77000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   1.50000E-02   1.75000E-02
TRANSFER PERCENT       0    0    0    1    3   1.00000E-01   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   1.00000E-01   4.46500E+03
 0.00000E+00
TIME INTERVAL          0    0    0    0    2   1.75000E-02   4.30000E-01
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   3.97000E+00   0.00000E+00
TIME INTERVAL          0    0    0    0    2   4.30000E-01   1.85300E+00
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-00   0.00000E+00
TIME INTERVAL          0    0    0    0    2   1.85300E+00   1.98000E+00
REMOVAL RATE           1    1    0    0    2   2.00000E+01   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-01   0.00000E+00
```

```
TIME INTERVAL          0    0    0    0    2   1.98000E+00   2.00000E+00
REMOVAL RATE           1    1    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    2    0    0    2   0.00000E+00   0.00000E+00
REMOVAL RATE           1    3    0    0    2   4.24000E-01   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
TRANSFER PERCENT       0    0    0    1    3   5.00000E-02   0.00000E+00
 1.28400E+03
TRANSFER PERCENT       0    0    0    2    3   5.00000E-02   4.46500E+03
 0.00000E+00
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT

CALCULATION FOR WHOLEBDY DOSE (REMS)

SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.004E-01	1.004E-01
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	1.624E-02	1.167E-01
1.750E-02	1.277E+00	1.354E+00	6.089E-02	6.459E-02	1.919E+00	2.036E+00
4.300E-01	2.717E+00	4.072E+00	1.296E-01	1.942E-01	4.084E+00	6.120E+00
1.853E+00	1.868E-01	4.259E+00	8.911E-03	2.031E-01	2.808E-01	6.401E+00
1.980E+00	2.886E-02	4.287E+00	1.376E-03	2.045E-01	4.337E-02	6.444E+00
2.000E+00	0.000E+00	4.287E+00	2.392E-01	4.437E-01	4.445E+00	1.089E+01
8.000E+00	0.000E+00	4.287E+00	2.310E-02	4.668E-01	1.642E+00	1.253E+01
2.400E+01	0.000E+00	4.287E+00	8.559E-03	4.754E-01	6.252E-01	1.316E+01
9.600E+01	0.000E+00	4.287E+00	8.313E-03	4.837E-01	7.422E-01	1.390E+01
	TOTAL	4.287E+00	TOTAL	4.837E-01	TOTAL	1.390E+01

CALCULATION FOR WHOLEBDY DOSE (REMS)

MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	6.681E-02	6.681E-02	3.186E-03	3.186E-03	1.018E-05	1.018E-05
1.500E-02	1.080E-02	7.761E-02	5.152E-04	3.702E-03	3.608E-06	1.378E-05
1.750E-02	9.619E-01	1.039E+00	4.587E-02	4.957E-02	4.033E-03	4.046E-03
4.300E-01	1.671E+00	2.710E+00	7.969E-02	1.293E-01	3.199E-02	3.604E-02
1.853E+00	1.109E-01	2.821E+00	5.291E-03	1.346E-01	3.501E-03	3.954E-02
1.980E+00	1.713E-02	2.838E+00	8.169E-04	1.354E-01	5.492E-04	4.009E-02
2.000E+00	0.000E+00	2.838E+00	1.366E-01	2.720E-01	7.363E-02	1.137E-01
8.000E+00	0.000E+00	2.838E+00	1.011E-02	2.821E-01	1.977E-02	1.335E-01
2.400E+01	0.000E+00	2.838E+00	3.093E-03	2.852E-01	3.673E-03	1.372E-01
9.600E+01	0.000E+00	2.838E+00	2.900E-03	2.881E-01	2.864E-03	1.400E-01
	TOTAL	2.838E+00	TOTAL	2.881E-01	TOTAL	1.400E-01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	1.171E-01	1.171E-01
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.841E-02	1.355E-01
1.750E-02	1.036E+00	1.126E+00	4.942E-02	5.372E-02	1.557E+00	1.693E+00
4.300E-01	1.808E+00	2.935E+00	8.624E-02	1.400E-01	2.718E+00	4.411E+00
1.853E+00	1.238E-01	3.058E+00	5.902E-03	1.459E-01	1.860E-01	4.597E+00
1.980E+00	1.912E-02	3.077E+00	9.119E-04	1.468E-01	2.874E-02	4.626E+00
2.000E+00	0.000E+00	3.077E+00	1.681E-01	3.149E-01	3.123E+00	7.749E+00
8.000E+00	0.000E+00	3.077E+00	2.190E-02	3.368E-01	1.557E+00	9.306E+00
2.400E+01	0.000E+00	3.077E+00	9.807E-03	3.466E-01	7.163E-01	1.002E+01
9.600E+01	0.000E+00	3.077E+00	9.531E-03	3.561E-01	8.510E-01	1.087E+01
	TOTAL	3.077E+00	TOTAL	3.561E-01	TOTAL	1.087E+01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	7.788E-02	7.788E-02	3.714E-03	3.714E-03	4.598E-04	4.598E-04
1.500E-02	1.225E-02	9.013E-02	5.842E-04	4.298E-03	1.614E-04	6.212E-04
1.750E-02	9.117E-01	1.002E+00	4.348E-02	4.778E-02	1.232E-01	1.238E-01
4.300E-01	1.373E+00	2.375E+00	6.548E-02	1.133E-01	8.792E-01	1.003E+00
1.853E+00	9.064E-02	2.465E+00	4.323E-03	1.176E-01	9.537E-02	1.098E+00
1.980E+00	1.398E-02	2.479E+00	6.668E-04	1.182E-01	1.494E-02	1.113E+00
2.000E+00	0.000E+00	2.479E+00	1.174E-01	2.357E-01	2.118E+00	3.231E+00
8.000E+00	0.000E+00	2.479E+00	1.370E-02	2.494E-01	9.399E-01	4.171E+00
2.400E+01	0.000E+00	2.479E+00	5.937E-03	2.553E-01	2.447E-01	4.416E+00
9.600E+01	0.000E+00	2.479E+00	6.498E-03	2.618E-01	2.251E-01	4.641E+00
	TOTAL	2.479E+00	TOTAL	2.618E-01	TOTAL	4.641E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	6.471E+00	6.471E+00
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.079E+00	7.550E+00
1.750E-02	1.180E+02	1.230E+02	5.628E+00	5.867E+00	1.774E+02	1.849E+02
4.300E-01	4.007E+02	5.238E+02	1.911E+01	2.498E+01	6.023E+02	7.872E+02
1.853E+00	3.532E+01	5.591E+02	1.684E+00	2.666E+01	5.308E+01	8.403E+02
1.980E+00	5.555E+00	5.646E+02	2.649E-01	2.693E+01	8.350E+00	8.487E+02
2.000E+00	0.000E+00	5.646E+02	7.617E+01	1.031E+02	1.415E+03	2.264E+03
8.000E+00	0.000E+00	5.646E+02	1.050E+01	1.136E+02	1.481E+03	3.745E+03
2.400E+01	0.000E+00	5.646E+02	1.484E+01	1.284E+02	1.622E+03	5.366E+03
9.600E+01	0.000E+00	5.646E+02	2.534E+01	1.538E+02	3.383E+03	8.750E+03
	TOTAL	5.646E+02	TOTAL	1.538E+02	TOTAL	8.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	4.305E+00	4.305E+00	2.053E-01	2.053E-01	4.611E-03	4.611E-03
1.500E-02	7.178E-01	5.023E+00	3.424E-02	2.395E-01	1.651E-03	6.261E-03
1.750E-02	3.766E+01	4.268E+01	1.796E+00	2.036E+00	9.470E-01	9.533E-01
4.300E-01	3.502E+01	7.771E+01	1.670E+00	3.706E+00	2.345E+00	3.298E+00
1.853E+00	1.742E+00	7.945E+01	8.306E-02	3.789E+00	1.440E-01	3.442E+00
1.980E+00	2.690E-01	7.972E+01	1.283E-02	3.802E+00	2.078E-02	3.463E+00
2.000E+00	0.000E+00	7.972E+01	3.630E+00	7.432E+00	2.192E+00	5.654E+00
8.000E+00	0.000E+00	7.972E+01	4.937E-01	7.926E+00	2.257E+00	7.911E+00
2.400E+01	0.000E+00	7.972E+01	6.968E-01	8.623E+00	1.483E+00	9.394E+00
9.600E+01	0.000E+00	7.972E+01	1.189E+00	9.812E+00	2.064E+00	1.146E+01
	TOTAL	7.972E+01	TOTAL	9.812E+00	TOTAL	1.146E+01

PAGE 4

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.410E-01	1.410E-01
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	2.280E-02	1.637E-01
1.750E-02	1.796E+00	1.905E+00	8.564E-02	9.084E-02	2.699E+00	2.863E+00
4.300E-01	3.827E+00	5.732E+00	1.825E-01	2.734E-01	5.752E+00	8.615E+00
1.853E+00	2.633E-01	5.995E+00	1.256E-02	2.859E-01	3.957E-01	9.011E+00
1.980E+00	4.066E-02	6.035E+00	1.939E-03	2.878E-01	6.111E-02	9.072E+00
2.000E+00	0.000E+00	6.035E+00	3.380E-01	6.259E-01	6.280E+00	1.535E+01
8.000E+00	0.000E+00	6.035E+00	3.307E-02	6.589E-01	2.352E+00	1.770E+01
2.400E+01	0.000E+00	6.035E+00	1.257E-02	6.715E-01	9.182E-01	1.862E+01
9.600E+01	0.000E+00	6.035E+00	1.227E-02	6.838E-01	1.096E+00	1.972E+01
	TOTAL	6.035E+00	TOTAL	6.838E-01	TOTAL	1.972E+01

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	9.377E-02	9.377E-02	4.472E-03	4.472E-03	1.422E-05	1.422E-05
1.500E-02	1.517E-02	1.089E-01	7.233E-04	5.196E-03	5.042E-06	1.926E-05
1.750E-02	1.347E+00	1.456E+00	8.425E-02	6.945E-02	5.633E-03	5.653E-03
4.300E-01	2.336E+00	3.793E+00	1.114E-01	1.809E-01	4.470E-02	5.035E-02
1.853E+00	1.552E-01	3.948E+00	7.401E-03	1.883E-01	4.894E-03	5.525E-02
1.980E+00	2.396E-02	3.972E+00	1.143E-03	1.894E-01	7.676E-04	5.601E-02
2.000E+00	0.000E+00	3.972E+00	1.919E-01	3.813E-01	1.034E-01	1.594E-01
8.000E+00	0.000E+00	3.972E+00	1.456E-02	3.959E-01	2.857E-02	1.880E-01
2.400E+01	0.000E+00	3.972E+00	4.763E-03	4.006E-01	5.708E-03	1.937E-01
9.600E+01	0.000E+00	3.972E+00	4.571E-03	4.052E-01	4.557E-03	1.983E-01
	TOTAL	3.972E+00	TOTAL	4.052E-01	TOTAL	1.983E-01

PAGE 5

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP30A DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	2.580E-01	2.580E-01
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	4.121E-02	2.992E-01
1.750E-02	2.832E+00	3.031E+00	1.351E-01	1.446E-01	4.257E+00	4.556E+00
4.300E-01	5.635E+00	8.666E+00	2.688E-01	4.133E-01	8.470E+00	1.303E+01
1.853E+00	3.870E-01	9.053E+00	1.846E-02	4.318E-01	5.817E-01	1.361E+01
1.980E+00	5.978E-02	9.113E+00	2.851E-03	4.346E-01	8.985E-02	1.370E+01
2.000E+00	0.000E+00	9.113E+00	5.061E-01	9.407E-01	9.404E+00	2.310E+01
8.000E+00	0.000E+00	9.113E+00	5.497E-02	9.957E-01	3.909E+00	2.701E+01
2.400E+01	0.000E+00	9.113E+00	2.238E-02	1.018E+00	1.635E+00	2.864E+01
9.600E+01	0.000E+00	9.113E+00	2.180E-02	1.040E+00	1.947E+00	3.059E+01
	TOTAL	9.113E+00	TOTAL	1.040E+00	TOTAL	3.059E+01

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00	0.000E+00
1.000E-05	1.717E-01	1.717E-01	8.187E-03	8.187E-03	4.740E-04	4.740E-04
1.500E-02	2.742E-02	1.991E-01	1.307E-03	9.494E-03	1.665E-04	6.405E-04
1.750E-02	2.259E+00	2.458E+00	1.077E-01	1.172E-01	1.288E-01	1.295E-01
4.300E-01	3.709E+00	6.167E+00	1.769E-01	2.941E-01	9.239E-01	1.053E+00
1.853E+00	2.458E-01	6.413E+00	1.172E-02	3.059E-01	1.003E-01	1.154E+00
1.980E+00	3.794E-02	6.451E+00	1.809E-03	3.077E-01	1.570E-02	1.169E+00
2.000E+00	0.000E+00	6.451E+00	3.093E-01	6.170E-01	2.222E+00	3.391E+00
8.000E+00	0.000E+00	6.451E+00	2.826E-02	6.452E-01	9.685E-01	4.359E+00
2.400E+01	0.000E+00	6.451E+00	1.070E-02	6.559E-01	2.504E-01	4.610E+00
9.600E+01	0.000E+00	6.451E+00	1.107E-02	6.670E-01	2.297E-01	4.839E+00
	TOTAL	6.451E+00	TOTAL	6.670E-01	TOTAL	4.839E+00

1 NO MORE CASES

END OF EXECUTION

ATTACHMENT 9

Unit 2 ESF Leakage, 61 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA4D.R5, MHA4D.RV5)

Input - MHA4D.R5

```
'ICRP30A                                                                    '
'TILTAPE   ','TIMTAPE   ','TINTAPE   '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)              '
'MHA4D.R5  UNIT 2 MHA ESF LEAKAGE, 61 CFM CR LEAKAGE'
'                                                                           '
 0, 0, 0, 1, 0
  1,  3
'ECCS    '
 6
 3.087E+03, 0.000E+00
 0.500E+00, 0.000E+00
 0.900E+00, 0.000E+00
 1.000E+00, 0.000E+00, 0.000E+00
 0.000E+00, 0.000E+00, 0.000E+00
 6.2898E+04, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 0.430E+00
'INITIAL FRACTION',0,0,0,0,1, 1.000E+00
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02
'DOSE PARAMS     ',0,0,0,0,7, 6.500E-04, 3.470E-04, 3.100E-05, 3.470E-04, 9.770E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 0.43E+00, 2.000E+00
'TRANSFER CFM    ',0,0,0,1,1, 1.212E-03
'TIME INTERVAL   ',0,0,0,0,2, 2.000E+00, 8.000E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 3.470E-04, 3.100E-05, 3.470E-04, 5.760E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 8.000E+00, 24.00E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 1.750E-04, 3.600E-06, 1.750E-04, 1.560E-04, 3.470E-04,
.1000E+00
'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 96.00E+00
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0500E+00
'TIME INTERVAL   ',0,0,0,0,2, 96.00E+00, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E-00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0500E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00□
```

Output - MHA4D.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                       REVISED TO REVISION 2 December 1996
                            BY OMEGA TECHNICAL SERVICES, INC.

                       REVISED TO REVISION 1 FEBRUARY 1995
                            BY OMEGA TECHNICAL SERVICES, INC.

                       MODIFIED FALL 1992 FOR GGNS
                            BY OMEGA TECHNICAL SERVICES, INC.

                       NUCLEAR REGULATORY COMMISSION
                         ACCIDENT EVALUATION BRANCH
                      DATE  11/30/2000    TIME  10:45:30

                        MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)
 MHA4D.R5  UNIT 2 MHA ESF LEAKAGE, 61 CFM CR LEAKAGE
1                           TIME INDEPENDENT INPUT
                              CASE NUMBER   1


                                NODES  NSTEP
                                  1      6

                            OUTPUT CONTROL PARAMETER
                        I        1    2    3    4    5
                   IPRINT(I)     0    0    0    1    0

                   NUMBER OF DOSE EVALUATION POINTS -   3


                 POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          5.000E-01     0.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          9.000E-01     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         5.000E-02     0.000E+00


                            ISOTOPIC SPLIT BY GROUP
                        ELEM.         ORG.          PART.
      HALOGENS       1.000E+00     0.000E+00     0.000E+00
                     0.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
           ECCS
           6.290E+04


                            CONTROL ROOM VOLUME (CU FT)
                                        4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
					91-E-0117-16	
0(3)	11/30/00	KLA	JL	ARKANSAS NUCLEAR ONE		
0(2)	10/10/00	JGM	MAM		PAGE NUMBER	Attachment 9
REV.	DATE	BY	CHK'D			3 OF 7

DATA FROM NUCLIDE FILE ICRP30A

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.5080000E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.8060000E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.6220000E+04	3.3188400E-02	9.110E-02	9.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	6.5750000E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	5.1030000E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   4.30000E-01
INITIAL FRACTION       0    0    0    0    1   1.00000E+00
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
DOSE PARAMS            0    0    0    0    7   6.50000E-04   3.47000E-04
 3.10000E-05   3.47000E-04   9.77000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   4.30000E-01   2.00000E+00
TRANSFER CFM           0    0    0    1    1   1.21200E-03
TIME INTERVAL          0    0    0    0    2   2.00000E+00   8.00000E+00
DOSE PARAMS            0    0    0    0    7   0.00000E+00   3.47000E-04
 3.10000E-05   3.47000E-04   5.76000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   8.00000E+00   2.40000E+01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   1.75000E-04
 3.60000E-06   1.75000E-04   2.56000E-04   3.47000E-04   1.00000E-01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   9.60000E+01
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   5.00000E-02
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   5.00000E-02
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	9.788E-02	9.788E-02	4.668E-03	4.668E-03	1.471E-01	1.471E-01
4.300E-01	2.489E-01	3.467E-01	1.187E-02	1.654E-02	3.741E-01	5.212E-01
2.000E+00	0.000E+00	3.467E-01	2.156E-02	3.809E-02	4.005E-01	9.217E-01
8.000E+00	0.000E+00	3.467E-01	2.725E-03	4.082E-02	1.938E-01	1.116E+00
2.400E+01	0.000E+00	3.467E-01	1.147E-03	4.197E-02	8.377E-02	1.199E+00
9.600E+01	0.000E+00	3.467E-01	1.136E-03	4.310E-02	1.014E-01	1.301E+00
	TOTAL	3.467E-01	TOTAL	4.310E-02	TOTAL	1.301E+00

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

4.300E-01	6.906E-03	6.906E-03	3.293E-04	3.293E-04	7.842E-06	7.842E-06
2.000E+00	0.000E+00	6.906E-03	5.983E-04	9.276E-04	1.057E-05	1.841E-05
8.000E+00	0.000E+00	6.906E-03	7.567E-05	1.003E-03	5.252E-06	2.366E-05
2.400E+01	0.000E+00	6.906E-03	6.371E-05	1.067E-03	2.762E-06	2.643E-05
9.600E+01	0.000E+00	6.906E-03	6.339E-05	1.130E-03	2.253E-06	2.868E-05
	TOTAL	6.906E-03	TOTAL	1.130E-03	TOTAL	2.868E-05

PAGE 2

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	3.862E-02	3.862E-02	1.842E-03	1.842E-03	5.805E-02	5.805E-02
4.300E-01	1.038E-01	1.424E-01	4.951E-03	6.793E-03	1.560E-01	2.141E-01
2.000E+00	0.000E+00	1.424E-01	1.064E-02	1.744E-02	1.977E-01	4.118E-01
8.000E+00	0.000E+00	1.424E-01	1.720E-03	1.916E-02	1.223E-01	5.342E-01
2.400E+01	0.000E+00	1.424E-01	8.116E-04	1.997E-02	5.928E-02	5.934E-01
9.600E+01	0.000E+00	1.424E-01	6.360E-04	2.060E-02	5.678E-02	6.502E-01
	TOTAL	1.424E-01	TOTAL	2.060E-02	TOTAL	6.502E-01

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	2.881E-03	2.881E-03	1.374E-04	1.374E-04	1.082E-04	1.082E-04
2.000E+00	0.000E+00	2.881E-03	2.953E-04	4.327E-04	1.726E-04	2.808E-04
8.000E+00	0.000E+00	2.881E-03	4.776E-05	4.805E-04	1.088E-04	3.896E-04
2.400E+01	0.000E+00	2.881E-03	4.509E-05	5.256E-04	6.378E-05	4.534E-04
9.600E+01	0.000E+00	2.881E-03	3.550E-05	5.611E-04	4.117E-05	4.946E-04
	TOTAL	2.881E-03	TOTAL	5.611E-04	TOTAL	4.946E-04

PAGE 3

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	2.461E+01	2.461E+01	1.173E+00	1.173E+00	3.698E+01	3.698E+01
4.300E-01	8.832E+01	1.129E+02	4.212E+00	5.386E+00	1.329E+02	1.697E+02
2.000E+00	0.000E+00	1.129E+02	1.523E+01	2.062E+01	2.831E+02	4.528E+02
8.000E+00	0.000E+00	1.129E+02	2.100E+00	2.272E+01	2.961E+02	7.489E+02
2.400E+01	0.000E+00	1.129E+02	2.969E+00	2.569E+01	3.244E+02	1.073E+03
9.600E+01	0.000E+00	1.129E+02	5.067E+00	3.076E+01	6.767E+02	1.750E+03
	TOTAL	1.129E+02	TOTAL	3.076E+01	TOTAL	1.750E+03

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	2.451E+00	2.451E+00	1.169E-01	1.169E-01	9.724E-02	9.724E-02

2.000E+00	0.000E+00	2.451E+00	4.228E-01	5.397E-01	2.548E-01	3.520E-01
8.000E+00	0.000E+00	2.451E+00	5.831E-02	5.980E-01	2.665E-01	6.185E-01
2.400E+01	0.000E+00	2.451E+00	1.649E-01	7.629E-01	3.510E-01	9.696E-01
9.600E+01	0.000E+00	2.451E+00	2.829E-01	1.046E+00	4.909E-01	1.460E+00
	TOTAL	2.451E+00	TOTAL	1.046E+00	TOTAL	1.460E+00

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	1.394E-01	1.394E-01	6.650E-03	6.650E-03	2.096E-01	2.096E-01
4.300E-01	3.544E-01	4.939E-01	1.690E-02	2.355E-02	5.327E-01	7.423E-01
2.000E+00	0.000E+00	4.939E-01	3.069E-02	5.424E-02	5.703E-01	1.313E+00
8.000E+00	0.000E+00	4.939E-01	3.886E-03	5.813E-02	2.763E-01	1.589E+00
2.400E+01	0.000E+00	4.939E-01	1.638E-03	5.977E-02	1.196E-01	1.709E+00
9.600E+01	0.000E+00	4.939E-01	1.616E-03	6.138E-02	1.443E-01	1.853E+00
	TOTAL	4.939E-01	TOTAL	6.138E-02	TOTAL	1.853E+00

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	9.835E-03	9.835E-03	4.691E-04	4.691E-04	1.117E-05	1.117E-05
2.000E+00	0.000E+00	9.835E-03	8.518E-04	1.321E-03	1.505E-05	2.622E-05
8.000E+00	0.000E+00	9.835E-03	1.079E-04	1.429E-03	7.488E-06	3.371E-05
2.400E+01	0.000E+00	9.835E-03	9.098E-05	1.520E-03	3.944E-06	3.765E-05
9.600E+01	0.000E+00	9.835E-03	9.018E-05	1.610E-03	3.205E-06	4.086E-05
	TOTAL	9.835E-03	TOTAL	1.610E-03	TOTAL	4.086E-05

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	1.781E-01	1.781E-01	8.492E-03	8.492E-03	2.676E-01	2.676E-01
4.300E-01	4.583E-01	6.363E-01	2.186E-02	3.035E-02	6.888E-01	9.564E-01
2.000E+00	0.000E+00	6.363E-01	4.133E-02	7.168E-02	7.680E-01	1.724E+00
8.000E+00	0.000E+00	6.363E-01	5.606E-03	7.729E-02	3.987E-01	2.123E+00
2.400E+01	0.000E+00	6.363E-01	2.449E-03	7.974E-02	1.789E-01	2.302E+00
9.600E+01	0.000E+00	6.363E-01	2.252E-03	8.199E-02	2.010E-01	2.503E+00
	TOTAL	6.363E-01	TOTAL	8.199E-02	TOTAL	2.503E+00

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
4.300E-01	1.272E-02	1.272E-02	6.065E-04	6.065E-04	1.194E-04	1.194E-04
2.000E+00	0.000E+00	1.272E-02	1.147E-03	1.754E-03	1.877E-04	3.071E-04

```
 8.000E+00  0.000E+00  1.272E-02  1.357E-04  1.909E-03  1.163E-04  4.234E-04
 2.400E+01  0.000E+00  1.272E-02  1.361E-04  2.045E-03  6.772E-05  4.911E-04
 9.600E+01  0.000E+00  1.272E-02  1.257E-04  2.171E-03  4.437E-05  5.355E-04
                 TOTAL 1.272E-02       TOTAL 2.171E-03        TOTAL 5.355E-04


1 NO MORE CASES

 END OF EXECUTION
```

ATTACHMENT 10

Unit 2 Passive Failure, 61 cfm Control Room Inleakage
TRANSACT Input and Output

(MHA5D.R5, MHA5D.RV5)

Input - MHA5D.R5

```
'ICRP30a                                                                                  '
'TILTAPE    ','TIMTAPE    ','TINTAPE    '
'CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)                    '
' MHA5D.R5  UNIT 2 MHA ESF SEAL FAILURE, 61 CFM CR LEAKAGE '
'                                                                                 '
 0, 0, 0, 1, 0
  1,  3
'sc cool  '
 29
 3.087E+03, 0.000E+00
 0.500E+00, 0.000E+00
 0.000E+00, 0.000E+00
 1.000E+00, 0.000E+00, 0.000E+00
 0.000E+00, 0.000E+00, 0.000E+00
 6.2898E+04, 4.000E+04
'TIME INTERVAL   ',0,0,0,0,2, 0.000E+00, 2.400E+01
'INITIAL FRACTION',0,0,0,0,1, 1.000E+00
'CR FILTER EFF   ',1,1,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,2,0,0,2, 0.950E+02, 0.990E+02
'CR FILTER EFF   ',1,3,0,0,2, 0.950E+02, 0.990E+02

'TIME INTERVAL   ',0,0,0,0,2, 2.400E+01, 2.410E+01
'TRANSFER CFM    ',0,0,0,1,1, 6.685E-01
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 0.600E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E+00, 2.320E-04, 2.300E-06, 2.320E-04, 1.680E-04, 3.470E-04,
.0000E+00

'TIME INTERVAL   ',0,0,0,0,2, 2.410E+01, 2.420E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.420E+01, 2.430E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.430E+01, 2.440E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.440E+01, 2.450E+01

'TIME INTERVAL   ',0,0,0,0,2, 2.450E+01, 2.460E+01
'TRANSFER CFM    ',0,0,0,1,1, 0.000E+00

'TIME INTERVAL   ',0,0,0,0,2, 2.460E+01, 2.470E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.470E+01, 2.480E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.480E+01, 2.490E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.490E+01, 2.500E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.500E+01, 2.510E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.510E+01, 2.520E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.520E+01, 2.530E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.530E+01, 2.540E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.540E+01, 2.550E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.550E+01, 2.560E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.560E+01, 2.570E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.570E+01, 2.580E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.580E+01, 2.590E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.590E+01, 2.600E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.600E+01, 2.610E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.610E+01, 2.620E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.620E+01, 2.630E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.630E+01, 2.640E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.640E+01, 2.650E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.650E+01, 2.660E+01
'TIME INTERVAL   ',0,0,0,0,2, 2.660E+01, 9.600E+01

'TIME INTERVAL   ',0,0,0,0,2, 9.600E+01, 7.200E+02
'CONTROL ROOM    ',0,0,0,0,5, 6.100E+01, 3.330E+02, 3.940E+02, 1.667E+03, 0.400E+00
'DOSE PARAMS     ',0,0,0,0,7, 0.000E+00, 2.320E-04, 1.400E-06, 2.320E-04, 1.250E-04, 3.470E-04,
.0000E+00
'END             ',0,0,0,0,0, 0.000E+00, 0.000E+00
```

Output - MHA5D.RV5

```
1                    TRANSACT Version 1.0, Revision 2
                   Based on TACT V - SEP 87 PC VERSION


                      REVISED TO REVISION 2 December 1996
                           BY OMEGA TECHNICAL SERVICES, INC.

                      REVISED TO REVISION 1 FEBRUARY 1995
                           BY OMEGA TECHNICAL SERVICES, INC.

                      MODIFIED FALL 1992 FOR GGNS
                           BY OMEGA TECHNICAL SERVICES, INC.

                      NUCLEAR REGULATORY COMMISSION
                        ACCIDENT EVALUATION BRANCH
                     DATE  11/30/2000    TIME  10:45:58

                       MODEL SUMMARY FOR CASE    1

 CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA  (TRANSACT)
  MHA5D.R5  UNIT 2 MHA ESF SEAL FAILURE, 61 CFM CR LEAKAGE
1                          TIME INDEPENDENT INPUT
                             CASE NUMBER   1


                                NODES  NSTEP
                                  1     29

                            OUTPUT CONTROL PARAMETER
                        I        1    2    3    4    5
                   IPRINT(I)     0    0    0    1    0

                   NUMBER OF DOSE EVALUATION POINTS -   3


                 POWER (MWT)    REACTOR SHUTDOWN TIME (HRS)
                   3.087E+03              0.000E+00


    FRACTION OF ACTIVITY RELEASED FROM CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          5.000E-01     0.000E+00


                 PLATEOUT FACTOR FOR ACTIVITY RELEASED FROM
                    CORE TO CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
          0.000E+00     0.000E+00


    FRACTION OF CORE INVENTORY AIRBORNE IN THE CONTAINMENT BY ISOTOPIC GROUP
          HALOGENS
         5.000E-01     0.000E+00


                            ISOTOPIC SPLIT BY GROUP
                         ELEM.         ORG.          PART.
      HALOGENS       1.000E+00     0.000E+00     0.000E+00
                     0.000E+00     0.000E+00     0.000E+00


                            VOLUME OF NODES (CU FT)
           sc cool
           6.290E+04


                            CONTROL ROOM VOLUME (CU FT)
                                     4.000E+04
```

				Entergy Operations	CALCULATION NUMBER	
					91-E-0117-16	
0(3)	11/30/00	KLA	JL	ARKANSAS NUCLEAR ONE	PAGE NUMBER	Attachment 10
0(2)	10/10/00	JGM	MAM			3 OF 10
REV.	DATE	BY	CHK'D			

DATA FROM NUCLIDE FILE ICRP30a

ISOTOPE NAME	SPLIT	SOURCE (CI/MWT)	DECAY CONSTANT (1/HR)	DOSE CONVERSION FACTORS WHOLEBDY	SKIN-B	THYROID	SKIN-G	SKIN-T
I 131	ELEM.	2.5080000E+04	3.5870390E-03	5.590E-02	3.070E-02	1.100E+06	7.950E-02	0.000E+00
I 132	ELEM.	3.8060000E+04	2.9768400E-01	3.550E-01	1.100E-01	6.300E+03	5.070E-01	0.000E+00
I 133	ELEM.	5.6220000E+04	3.3188400E-02	9.110E-02	8.900E-02	1.800E+05	1.310E-01	0.000E+00
I 134	ELEM.	6.5750000E+04	8.0208000E-01	4.110E-01	1.420E-01	1.100E+03	5.860E-01	0.000E+00
I 135	ELEM.	5.1030000E+04	1.0310400E-01	2.490E-01	7.860E-02	3.100E+04	3.520E-01	0.000E+00

TIME DEPENDENT INPUT
CASE NUMBER 1

```
TIME INTERVAL          0    0    0    0    2   0.00000E+00   2.40000E+01
INITIAL FRACTION       0    0    0    0    1   1.00000E+00
CR FILTER EFF          1    1    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    2    0    0    2   9.50000E+01   9.90000E+01
CR FILTER EFF          1    3    0    0    2   9.50000E+01   9.90000E+01
TIME INTERVAL          0    0    0    0    2   2.40000E+01   2.41000E+01
TRANSFER CFM           0    0    0    1    1   6.68500E-01
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   6.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 2.30000E-06   2.32000E-04   1.68000E-04   3.47000E-04   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.41000E+01   2.42000E+01
TIME INTERVAL          0    0    0    0    2   2.42000E+01   2.43000E+01
TIME INTERVAL          0    0    0    0    2   2.43000E+01   2.44000E+01
TIME INTERVAL          0    0    0    0    2   2.44000E+01   2.45000E+01
TIME INTERVAL          0    0    0    0    2   2.45000E+01   2.46000E+01
TRANSFER CFM           0    0    0    1    1   0.00000E+00
TIME INTERVAL          0    0    0    0    2   2.46000E+01   2.47000E+01
TIME INTERVAL          0    0    0    0    2   2.47000E+01   2.48000E+01
TIME INTERVAL          0    0    0    0    2   2.48000E+01   2.49000E+01
TIME INTERVAL          0    0    0    0    2   2.49000E+01   2.50000E+01
TIME INTERVAL          0    0    0    0    2   2.50000E+01   2.51000E+01
TIME INTERVAL          0    0    0    0    2   2.51000E+01   2.52000E+01
TIME INTERVAL          0    0    0    0    2   2.52000E+01   2.53000E+01
TIME INTERVAL          0    0    0    0    2   2.53000E+01   2.54000E+01
TIME INTERVAL          0    0    0    0    2   2.54000E+01   2.55000E+01
TIME INTERVAL          0    0    0    0    2   2.55000E+01   2.56000E+01
TIME INTERVAL          0    0    0    0    2   2.56000E+01   2.57000E+01
TIME INTERVAL          0    0    0    0    2   2.57000E+01   2.58000E+01
TIME INTERVAL          0    0    0    0    2   2.58000E+01   2.59000E+01
TIME INTERVAL          0    0    0    0    2   2.59000E+01   2.60000E+01
TIME INTERVAL          0    0    0    0    2   2.60000E+01   2.61000E+01
TIME INTERVAL          0    0    0    0    2   2.61000E+01   2.62000E+01
TIME INTERVAL          0    0    0    0    2   2.62000E+01   2.63000E+01
TIME INTERVAL          0    0    0    0    2   2.63000E+01   2.64000E+01
TIME INTERVAL          0    0    0    0    2   2.64000E+01   2.65000E+01
TIME INTERVAL          0    0    0    0    2   2.65000E+01   2.66000E+01
TIME INTERVAL          0    0    0    0    2   2.66000E+01   9.60000E+01
TIME INTERVAL          0    0    0    0    2   9.60000E+01   7.20000E+02
CONTROL ROOM           0    0    0    0    5   6.10000E+01   3.33000E+02
 3.94000E+02   1.66700E+03   4.00000E-01
DOSE PARAMS            0    0    0    0    7   0.00000E+00   2.32000E-04
 1.40000E-06   2.32000E-04   1.25000E-04   3.47000E-04   0.00000E+00
```

PAGE 1

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR WHOLEBDY DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.

0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00		TOTAL 0.000E+00		TOTAL 0.000E+00

CALCULATION FOR WHOLEBDY DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	ACCUM.	LOW POPULATION ZONE EACH STEP	ACCUM.	CONTROL ROOM EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.056E-03	1.056E-03	6.206E-06	6.206E-06
2.410E+01	0.000E+00	0.000E+00	1.052E-03	2.108E-03	1.639E-05	2.259E-05
2.420E+01	0.000E+00	0.000E+00	1.048E-03	3.156E-03	2.387E-05	4.647E-05
2.430E+01	0.000E+00	0.000E+00	1.043E-03	4.199E-03	2.937E-05	7.583E-05
2.440E+01	0.000E+00	0.000E+00	1.039E-03	5.238E-03	3.339E-05	1.092E-04
2.450E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.023E-05	1.395E-04
2.460E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.238E-05	1.618E-04
2.470E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.657E-05	1.784E-04
2.480E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.227E-05	1.907E-04
2.490E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	9.081E-06	1.998E-04
2.500E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	6.723E-06	2.065E-04
2.510E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	4.977E-06	2.115E-04
2.520E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.685E-06	2.151E-04
2.530E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.728E-06	2.179E-04
2.540E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.020E-06	2.199E-04
2.550E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.495E-06	2.214E-04
2.560E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.107E-06	2.225E-04
2.570E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	8.197E-07	2.233E-04
2.580E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	6.069E-07	2.239E-04
2.590E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	4.494E-07	2.244E-04
2.600E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	3.327E-07	2.247E-04
2.610E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	2.463E-07	2.249E-04
2.620E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.824E-07	2.251E-04
2.630E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.351E-07	2.253E-04
2.640E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	1.000E-07	2.254E-04
2.650E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	7.405E-08	2.254E-04
2.660E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	0.000E+00	2.254E-04
9.600E+01	0.000E+00	0.000E+00	0.000E+00	5.238E-03	0.000E+00	2.254E-04
	TOTAL	0.000E+00		TOTAL 5.238E-03		TOTAL 2.254E-04

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-B DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-B DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	7.466E-04	7.466E-04	1.432E-04	1.432E-04
2.410E+01	0.000E+00	0.000E+00	7.440E-04	1.491E-03	3.783E-04	5.215E-04
2.420E+01	0.000E+00	0.000E+00	7.414E-04	2.232E-03	5.516E-04	1.073E-03
2.430E+01	0.000E+00	0.000E+00	7.388E-04	2.971E-03	6.780E-04	1.752E-03
2.440E+01	0.000E+00	0.000E+00	7.363E-04	3.707E-03	7.724E-04	2.525E-03
2.450E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	7.000E-04	3.225E-03
2.460E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	5.186E-04	3.743E-03
2.470E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	3.841E-04	4.127E-03
2.480E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.846E-04	4.412E-03
2.490E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.108E-04	4.623E-03
2.500E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.562E-04	4.779E-03
2.510E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.157E-04	4.894E-03
2.520E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	8.571E-05	4.980E-03
2.530E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	6.350E-05	5.044E-03
2.540E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	4.704E-05	5.091E-03
2.550E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	3.485E-05	5.126E-03
2.560E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.582E-05	5.151E-03
2.570E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.913E-05	5.171E-03
2.580E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.417E-05	5.185E-03
2.590E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.050E-05	5.195E-03
2.600E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	7.778E-06	5.203E-03
2.610E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	5.763E-06	5.209E-03
2.620E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	4.269E-06	5.213E-03

2.630E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	3.163E-06	5.216E-03
2.640E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	2.344E-06	5.219E-03
2.650E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	1.736E-06	5.220E-03
2.660E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	0.000E+00	5.220E-03
9.600E+01	0.000E+00	0.000E+00	0.000E+00	3.707E-03	0.000E+00	5.220E-03
	TOTAL	0.000E+00	TOTAL	3.707E-03	TOTAL	5.220E-03

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR THYROID DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR THYROID DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME	EACH	ACCUM.	EACH	ACCUM.	EACH	ACCUM.
(HRS)	STEP		STEP		STEP	
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.575E+00	1.575E+00	4.523E-01	4.523E-01
2.410E+01	0.000E+00	0.000E+00	1.574E+00	3.149E+00	1.197E+00	1.650E+00
2.420E+01	0.000E+00	0.000E+00	1.572E+00	4.722E+00	1.750E+00	3.400E+00
2.430E+01	0.000E+00	0.000E+00	1.571E+00	6.293E+00	2.160E+00	5.559E+00
2.440E+01	0.000E+00	0.000E+00	1.570E+00	7.863E+00	2.463E+00	8.022E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.237E-00	1.026E+01
2.460E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.662E+00	1.192E+01
2.470E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.234E+00	1.316E+01
2.480E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	9.165E-01	1.407E+01
2.490E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	6.807E-01	1.475E+01
2.500E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	5.055E-01	1.526E+01
2.510E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	3.755E-01	1.563E+01
2.520E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.788E-01	1.591E+01

2.530E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.071E-01	1.612E+01
2.540E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.538E-01	1.627E+01
2.550E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.142E-01	1.639E+01
2.560E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	8.484E-02	1.647E+01
2.570E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	6.301E-02	1.654E+01
2.580E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	4.680E-02	1.658E+01
2.590E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	3.475E-02	1.662E+01
2.600E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	2.581E-02	1.664E+01
2.610E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.917E-02	1.666E+01
2.620E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.424E-02	1.668E+01
2.630E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	1.057E-02	1.669E+01
2.640E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	7.854E-03	1.669E+01
2.650E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	5.833E-03	1.670E+01
2.660E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	0.000E+00	1.670E+01
9.600E+01	0.000E+00	0.000E+00	0.000E+00	7.863E+00	0.000E+00	1.670E+01
	TOTAL	0.000E+00	TOTAL	7.863E+00	TOTAL	1.670E+01

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-G DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-G DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START	EXCLUSION RADIUS		LOW POPULATION ZONE		CONTROL ROOM	
TIME (HRS)	EACH STEP	ACCUM.	EACH STEP	ACCUM.	EACH STEP	ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	1.509E-03	1.509E-03	8.862E-06	8.862E-06
2.410E+01	0.000E+00	0.000E+00	1.502E-03	3.011E-03	2.340E-05	3.226E-05
2.420E+01	0.000E+00	0.000E+00	1.496E-03	4.507E-03	3.409E-05	6.636E-05

2.430E+01	0.000E+00	0.000E+00	1.490E-03	5.997E-03	4.194E-05	1.083E-04
2.440E+01	0.000E+00	0.000E+00	1.484E-03	7.480E-03	4.768E-05	1.560E-04
2.450E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	4.318E-05	1.992E-04
2.460E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.197E-05	2.311E-04
2.470E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.366E-05	2.548E-04
2.480E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.752E-05	2.723E-04
2.490E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.297E-05	2.853E-04
2.500E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	9.602E-06	2.949E-04
2.510E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	7.108E-06	3.020E-04
2.520E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	5.263E-06	3.072E-04
2.530E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.896E-06	3.111E-04
2.540E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.885E-06	3.140E-04
2.550E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.136E-06	3.162E-04
2.560E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.581E-06	3.177E-04
2.570E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.171E-06	3.189E-04
2.580E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	8.669E-07	3.198E-04
2.590E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	6.418E-07	3.204E-04
2.600E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	4.752E-07	3.209E-04
2.610E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	3.519E-07	3.212E-04
2.620E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	2.605E-07	3.215E-04
2.630E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.929E-07	3.217E-04
2.640E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.429E-07	3.218E-04
2.650E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	1.058E-07	3.220E-04
2.660E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	0.000E+00	3.220E-04
9.600E+01	0.000E+00	0.000E+00	0.000E+00	7.480E-03	0.000E+00	3.220E-04
	TOTAL	0.000E+00	TOTAL	7.480E-03	TOTAL	3.220E-04

SUMMARY OF OFF-SITE DOSES

CONTROL ROOM HABITABILITY ANALYSIS, ICRP 30 DATA (TRANSACT)
CALCULATION FOR SKIN-T DOSE (REMS)
SINGLE NODE CONTAINMENT WITH NO ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.410E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.420E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.430E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.440E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.450E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.460E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.470E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.480E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.490E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.500E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.510E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.520E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.530E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.540E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.550E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.560E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.570E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.580E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.590E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.610E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.620E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.630E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.640E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.650E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.660E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
9.600E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
	TOTAL	0.000E+00	TOTAL	0.000E+00	TOTAL	0.000E+00

CALCULATION FOR SKIN-T DOSE (REMS)
MULTI NODE CONTAINMENT WITH ESF

START TIME (HRS)	EXCLUSION RADIUS EACH STEP	EXCLUSION RADIUS ACCUM.	LOW POPULATION ZONE EACH STEP	LOW POPULATION ZONE ACCUM.	CONTROL ROOM EACH STEP	CONTROL ROOM ACCUM.
0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
2.400E+01	0.000E+00	0.000E+00	2.255E-03	2.255E-03	1.521E-04	1.521E-04
2.410E+01	0.000E+00	0.000E+00	2.246E-03	4.501E-03	4.017E-04	5.538E-04
2.420E+01	0.000E+00	0.000E+00	2.237E-03	6.739E-03	5.857E-04	1.139E-03
2.430E+01	0.000E+00	0.000E+00	2.229E-03	8.967E-03	7.209E-04	1.860E-03
2.440E+01	0.000E+00	0.000E+00	2.220E-03	1.119E-02	8.201E-04	2.681E-03
2.450E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	7.432E-04	3.424E-03
2.460E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	5.505E-04	3.974E-03
2.470E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.078E-04	4.382E-03
2.480E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	3.021E-04	4.684E-03
2.490E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.238E-04	4.908E-03
2.500E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.658E-04	5.074E-03
2.510E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.228E-04	5.196E-03
2.520E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	9.097E-05	5.287E-03
2.530E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	6.740E-05	5.355E-03
2.540E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.993E-05	5.405E-03
2.550E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	3.699E-05	5.442E-03
2.560E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.740E-05	5.469E-03
2.570E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.030E-05	5.489E-03
2.580E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.504E-05	5.504E-03
2.590E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.114E-05	5.516E-03
2.600E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	8.254E-06	5.524E-03
2.610E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	6.115E-06	5.530E-03
2.620E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	4.530E-06	5.535E-03
2.630E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	3.356E-06	5.538E-03
2.640E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	2.486E-06	5.540E-03
2.650E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	1.842E-06	5.542E-03
2.660E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	0.000E+00	5.542E-03
9.600E+01	0.000E+00	0.000E+00	0.000E+00	1.119E-02	0.000E+00	5.542E-03
	TOTAL	0.000E+00	TOTAL	1.119E-02	TOTAL	5.542E-03

1 NO MORE CASES

END OF EXECUTION