CALCULATION TITLE PAGE

Total Number of Pages: 34

MP-2 Fuel Handling Accident in the Spent Fuel Pool with 2% EBFS Bypass

TITLE

96RAD-1378R2	2	N/A
CALCULATION #	REVISION No.	SYSTEM NAME
N/A	N/A	N/A
VENDOR CALCULATION NUMBER	Structure	System Number

NUCLEAR INDICATOR:	Calc. Supports DCR/MMOD?	Calc. Supports Ind. Analysis?	N/A
☒CAT1 ☐RWQA ☐SBOQA ☐FPQA ☐ATWSQA ☐NON-QA	☐YES ☒ NO	☐YES ☒NO	Component
	↓ N/A DCR/MMOD No.	↓ N/A Reference	

INCORPORATES:

CCN NO:	AGAINST REV.
N/A	N/A

Executive Summary

This calculation represents a reanalysis and complete rewrite of the MP2 FHA in the spent fuel pool with 2% EBFS bypass to the EAB and LPZ. The calculation now also includes dose to the control room. The changes in this calculation include: new atmospheric dispersion (X/Q's) factors, new MP-2 specific source term, the power level was increased by 2% for instrument uncertainity based on the guidance in Regulatory Guide 1.49 and the peaking factor is now 1.83. The new results are: EAB thyroid: 5.125E+0 rem, EAB whole body: 9.223E-2 rem; LPZ thyroid: 1.144E+0 rem, LPZ whole body: 2.387E-2 rem; Control Room thyroid: 1.955E+1 rem, Control Room whole body: 7.331E-2 rem, Control Room skin: 2.268E+0 rem. This calculation superceedes 78-772-16RA.

COPY

Approvals (Print & Sign Name)			
Preparer::James L. Wheeler		Date:	8/19/98
Interdiscipline Reviewer:N/A	Discipline:	Date:	
Interdiscipline Reviewer:N/A	Discipline:	Date:	
Independent Reviewer:William Eakin		Date:	8/19/98
Supervisor: M L Vanhellemont for MSK		Date:	8/24/98

Installation Verification

☒ Calculation accurately reflects plant configuration, OR

☐ N/A does not affect plant configuration)

Preparer/Designer Engineer:James L. Wheeler Date: 8/19/98

CF #4

MILLSTONE 2 - FUEL HANDLING ACCIDENT
IN SPENT FUEL POOL WITH 2% EBFS BYPASS

TITLE

96RAD-1378-R2 — **CALCULATION #**

REV 1 — **REV. #**

System SFP VENTILATION **Structure** ENCLOSURE BLDG **Component** _____

Executive Summary

THIS CALC IS BEING REVISED TO CORRECT AN ERROR IN THE CALCULATION OF THE BYPASS PORTION OF THE IODINE RELEASE, CASE C. THE TACT III INPUTS ARE CORRECTED TO ① ROUND-OFF RELEASE FRACTIONS IN A MORE CONSERVATIVE FASHION, AND ② REFLECT NO FILTRATION FOR THIS CASE. THIS RESULTS IN AN INCREASE IN THE THYROID AND SLIGHT INCREASE IN THE WHOLE BODY DOSES. AS SEEN FROM THE RESULTS, THE DOSES ARE WELL WITHIN THE 10 CFR 100 DOSE LIMITS OF 300 REM THYROID AND 25 REM WHOLE BODY, THE STANDARD REVIEW PLAN SECTION 15.7.4 GUIDELINES OF 75 REM THYROID AND 6 REM WHOLE BODY, AND ARE CONSISTENT WITH RESULTS PREVIOUSLY CALCULATED.

	EAB Doses (Rem)		LPZ Doses (Rem)	
	WHOLE BODY	THYROID	WHOLE BODY	THYROID
CORRECTED	0.10	5.27	0.03	1.16
REV. 0	0.09	3.35	0.03	1.04

REVISED PAGES: p2, Table 1; p4, Table 3; p5, Table 6; For bulk considerations, earlier TACT appendices A, B, & D are not included. Both previous & corrected Cases C are included.

Does this calculation:		
1.	Support a DCR, MMOD, an independent review method for a DCR ,or confirm test results for an installed DCR? If yes, indicate the DCR, MMOD number and/or Test Procedure number.	Yes ☐ No ☒
2.	Support independent analysis? If yes, indicate the procedure or work control reference it supports.	Yes ☐ No ☒
3.	Revise or supersedes, or voids existing calculations? If yes, indicate the calculation number and revisions. 96RAD-1378-R2 Rev 0	Yes ☒ No ☐
4.	Involve QA-related systems, components or structures (ATWS, Fire Protection, Radwaste, HELB/MELB)?	Yes ☒ No ☐

Approvals

Preparer/Date: David Marcilli 4/29/96

Independent Reviewer/Date: William J. Eck 4/29/96

Design Engineering Supervisor/Date: Floyd A. Crawford 5/1/96

NUC DCM FORM 5-1A
Rev. 02

CH #4

PassPort DATABASE INPUTs

Calculation Number: 96RAD (prefix) 1378 (sequence no.) R2 (suffix) Revision: 2

Vendor Calculation Number/Other: N/A Revision: N/A

CCN # N/A QA ☒ Yes ☐ No Calc Voided: ☐ Yes ☒ No

Superseded By: N/A Supersedes Calc: 78-772-16RA

Discipline (Up to 10) Z

Unit	Project Reference (EWA)	Component Id	Computer Code	Rev. No./ Level No.
2	N/A	N/A	TACTIII	83.0
			CRADLE	2/2

PMMS CODES*

Structure	System	Component	Reference Calculation	Rev No.
N/A	N/A	N/A	NUC-181	0
			070771300.WM(B)-03	0
			WM(B)-05	0
			3D00	5
			WM(B)-02	0
			UR(B)-453	0

*The codes required must be alpha codes designed for structure, system and component.

Reference Drawing	Sheet	Rev. No.
25203-26028	5	20

Comments:

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TOTAL PAGES: 34

I. Purpose/Objective:

The purpose of this calculation is to reanalyze the radiological consequences of a Fuel Handling Accident (FHA) in the Spent Fuel Pool (SFP) at Millstone Unit 2 using revised assumptions.

II. Summary of Results

The results in Table II-1 and II-2 for the EAB and LPZ show that the thyroid and whole body doses calculated are all less than the Standard Review Plan 15.7.4 limits of 75 rem and 6 rem, respectively (Ref. 1). The results in Table II-3 for the control room show that the thyroid, whole body and beta skin doses are less than the GDC19 criteria of 30 rem, 5 rem and 30 rem respectfully.

Table II-1

EAB 0 - 2 Hour DOSE (rem)

Release	Thyroid	Whole Body
Bypass	1.701E+00	6.843E-03
EBFS	3.424E+00	8.528E-02
20% Kr-85 Bypass	-	7.510E-06
20% Kr-85 EBFS	-	1.005E-04
TOTAL	5.125E+00	9.223E-02

Table II-2

LPZ 0-2 Hour DOSE (rem)

Release	Thyroid	Whole Body
Bypass	2.231E-01	8.974E-04
EBFS	9.211E-01	2.294E-02
20% Kr-85 Bypass	-	9.849E-07
20% Kr-85 EBFS	-	2.702E-05
TOTAL	1.144E+00	2.387E-02

Table II-3

Control Room Dose (rem)

Release	Thyroid	Whole Body	Skin
Bypass	1.46E+01	2.19E-02	6.42E-01
EBFS	4.95E+00	4.90E-02	1.44E+00
20% Kr-85 Bypass	-	7.41E-04	5.72E-02
20% Kr-85 EBFS	-	1.67E-03	1.29E-01
TOTAL	1.955E+01	7.331E-02	2.268E+00

III. References

1) Standard Review Plan 15.7.4, "Radiological Consequences of Fuel Handling Accidents", Rev. 1, July 1981.

2) MP2 Facility Operating License, Docket No 50-336, May 5, 1983

3) Regulatory Guide 1.25, Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors, Rev. 0, March 1972.

4) TACT III, Atmospheric Transport Code System, Oak Ridge National Laboratory, CCC-447, version 83.0.

5) Report of Committee II on Permissible Dose for Internal Radiation, ICRP Publication 2, Permagon Press, New York, 1959.

6) Annals of the ICRP, Limits for Intakes of Radionuclides by Workers, ICRP30 Supplement to Part 1, Volume 3, No. 1-4, Permagon Press, New York, First Edition, 1980.

7) Millstone Nuclear Power Station Unit 2 Final Safety Analysis Report.

8) DiNunno, J. J. et. al., Calculation of Distance Factors for Power and Test Reactor Sites, TID-14844, U. S. Atomic Energy Commission, March 23, 1962.

9) Millstone Nuclear Power Station Unit 2 Technical Specifications

10) "MP-2 Design Basis Loss of Coolant Accident - Radiation Source Term", DES Calculation NUC-181, Rev. 0, June 1998.

11) Technical Evaluation M2-EV-98-0114, "Design Input for EQ Dose Calculations", Rev. 0, May 1998.

12) Siemens Document No. EMF-93-216(P), Millstone Unit 2 Mechanical Design Report for Reload Batch R (MIB-4)

13) "Normalized Concentrations (X/Q) at the EAB and LPZ for Gaseous Releases from the Unit 1 Stack and the Unit 2 Containment, Stack, PORV's/ADV's and MSLB", SWEC Calculation 070771300.WM(B)-03, Rev. 0, July 1998

14) P&ID 25203-26028, Sheet 5 of 5

15) Regulatory Guide 1.52, rev. 2, "Design, Testing and Maintenance Criteria for Post Accident Engineered Safety Feature Atmosphere Clean-up System Air Filtration and Adsorption Units of Light Water Cooled Nuclear Power Plants", USNRC, March 1978

16) "Assessment of the Use of Extended Burnup Fuel in Light Water Power Reactors", NUREG/CR-5009, 1988

17) "Auxiliary Building Elevator Shaft 'Smoke Hole' Flow Determination", Millstone Nuclear Power Station Special Procedure SPROC 95-2-11, Rev. 0. Test Performed 2/8/96.

18) Code of Federal Regulations, 10CFR Part 100 - Reactor Site Criteria.

19) "X/Q's at Unit 2 Control Room Intake From the Top of the Unit 1 Stack Under Fumigation Conditions", Calculation WM(B)-05, Rev. 0, June 1998

20) NRC Standard Review Plan 6.4, Rev. 2, "Control Room Habitability System", NUREG-0800, July 1981.

21) ERC 25203-ER-98-0050, Rev. 2, "Control Room Filtration System Design Basis Parameters for Inputs to Revise Millstone Unit 2 Control Room Post-Accident Radiological Habitability Analyses", June, 1998.

22) CRADLE - Control Room Accident Dose Level Evaluations, QA Category 1 Calculation #XX-XXX-37 RA, Rev. 2, Donald Miller Nov. 22, 1982.

23) Bechtel Calc. 3D00-5, Containment Heat Sinks, dated 6/04/74

24) Normalized X/Qs at the Unit 2 & 3 Control Room and TSC for Releases from Unit 2, Calculation No. 07077.13-WM(B)-02, Rev. 0, July, 1998

25) "MP-2 Control Room Operator Doses Following a MP-3 LOCA Assuming Duct Leakage and Damper Bypass", UR(B)-453, Rev. 0, June, 1998

IV. Assumptions

The assumptions used in this calculation are listed in Table IV-1.

Table IV-1

FHA Assumptions

ASSUMPTIONS	BASIS
1) Power Level = 2754 MW	Ref. 2
2) Core Inventory	Ref. 10
3) Core Release Fractions: 12% iodines 10% noble gas 30% Kr-85	Ref. 16 and conservative assumption for iodines
4) Iodine Chemical Form: 75% elemental 25% organic	Ref. 3
5) Offsite Breathing Rate (m^3/sec) : >24 hrs = 3.47E-4	Ref. 3
6) SFP Decontamination Factor: iodines: 100 noble gasses: 1	Ref 3
7) Release Point: EBFS - MP-1 Stack Bypass - Ground	Ref. 14
8) Minimum time after shutdown for fuel transfer: 72 hours	Ref. 9
9) Fraction of Release Bypassing EBFS: 2%	Ref. 17
10) Peaking Factor: 1.83	Ref. 12
11) Filter Efficiency Elemental - 90% Organic - 70%	Ref. 3
12) Assemblies Damaged: Conservative - 1	Conservative Assumption
13) X/Q (sec/m^3): Stack: EAB (0-2) hr = 1.00E-4 LPZ (0-4) hr = 2.69E-5 Control Room (0-4) hr = 2.51E-4 (4-8) hr = 1.96E-5 (8-24) hr = 5.46E-6 (24-96) hr = 3.43E-7 (96-720) hr = 6.44E-9 Ground: EAB (0-2) hr = 3.66E-4 LPZ (0-4) hr = 4.80E-5 Control Room (0-8) hr = 5.46E-3 (8-24) hr = 3.45E-3 (24-96) hr = 1.23E-3 (96-720) hr = 3.98E-4	Ref. 13 and 24
15) Dose Conversion Factors	Ref. 6
16) Recirc Rate Thru Filtration System: 2,250 cfm	Ref. 21
17) Time at Which Recirc Starts Thru Filtration Units: 10 min.	Ref. 21
18) Unfiltered Inleakage Rate: 130 cfm	Ref. 21
19) Control Room Charcoal Efficiency: 90%	Ref. 21
20) Intake Flowrate Prior to Control Room Isolation: 800 cfm	Ref. 21
21) Control Room Isolates Within 10 Seconds	Ref. 21 & Conservative Assump.
22) Control Room Volume: 35,650 ft3	Ref. 21
23) All activity must be released within 2 hours	Ref. 3

V. Method:

This reanalysis of the MP2 FHA dose calculation uses the assumptions as listed herein. The reason for this reanalysis is due to the following assumption changes:

1. The peaking factor is now 1.83.
2. A new MP-2 specific source term was calculated.
3. New atmospheric dispersion factors (X/Q's) were calculated.
4. The power level was increased by 2% for instrument uncertainty based on the guidance in Regulatory Guide 1.49.
5. This calculation also now analyzes the dose to the control room.

The TACT III (version 83.0) (Ref. 4) computer code was used in this analysis. TACT III (ver. 83) was validated per NEO 2.24/QS-3 and was last benchmarked on July, 1998. TACT III "simulates the movement of radioactivity released from a reactor core as it migrates through user-defined regions (nodes) of the containment, is immobilized by filters and sprays, and leaks to the outside environment... Outputs are shown for the end of each time interval and include the level of radioactivity in each node of the containment and in the environment, broken down as iodines, noble gases, and solids...; and the radiation dose to reference individuals at the exclusion radius, the boundary of the low population zone, and in the control room.", (Ref. 4).

Although reference 16 states that 10% of the iodines are available for release (except I-131 which is 12%), 12% will be used for all iodines for simplicity. Four TACTIII runs will be made; two each for EBFS and EBFS bypass. Each release point will be analyzed with the 12% iodines and 10% noble gasses. Another TACTIII run will be made with the additional 20% of KR-85. The whole body doses from these runs will then be summed.

The thyroid dose conversion factors (DCF)s currently used in the TACT III code date back to Reg Guide 1.109, Rev. 1, (Ref. 4 & 5). ICRP 30 adult thyroid DCF's will be used in this analysis because they are more up-to-date and realistic. Table VI-10 lists both the TACT III and ICRP 30 thyroid dose conversion factors and TACT-to-ICRP30 conversion ratios for each iodine isotope. In Table VI-12 the TACT III thyroid dose for each isotope is converted to ICRP 30 dose using the ratios as listed in Table VI-10.

The CRADLE (version 2) (Ref. 22) computer code was used for the control room exposure calculations in this analysis. CRADLE was validated per NEO 2.24/QS-3 and was last benchmarked on July 1998. CRADLE calculates the activity which enters the control room after an accident. The effects of filtration, buildup, decay and plateout are taken into account in the transport of activity from the core into containment to the environment and eventually to the control

room, (Ref. 22). From the activity in the control room, CRADLE calculates the resulting thyroid, whole body and beta doses to the control room operators.

The thyroid dose conversion factors (DCF)s currently used in the CRADLE code date back to Reg Guide 1.109, Rev. 1, (Ref. 5). ICRP 30 adult thyroid DCF's will be used in this analysis because they are more up-to-date and realistic. Table VI-10 lists both the Reg Guide 1.109 and ICRP 30 thyroid dose conversion factors and Reg Guide 1.109-to-ICRP30 conversion ratios for each iodine isotope. In Table VI-13, 14, 15, 18, 19 and 20 the CRADLE thyroid dose for each isotope is converted to ICRP 30 dose using the ratios as listed in Table VI-10.

VI. Analysis

A. Release Activity

Rather than use the inventories in TACT III based on TID 14844, the source core activity was taken from Reference 10. The equation for calculating the core release fraction is:

$$Fc = (1/N) * P * (1/DF) * Fg * Fp$$

where:

Fc = isotopic release fraction of core, by path
N = number of fuel assemblies in core, 217
P = peaking factor, 1.83
DF = decontamination factor, 100 for iodines, 1 for noble gasses
Fg = fraction of fuel in the gap, 12% iodines, 10% noble gasses, additional 20% Kr-85
Fp = fraction of release by path, 98% EBFS, 2% bypass

Therefore:

Fc(iodines, EBFS)	=	9.92E-06
Fc(iodines, bypass)	=	2.02E-07
Fc(noble gas, EBFS)	=	8.27E-04
Fc(noble gas, bypass)	=	1.69E-05
Fc(Kr-85 add, EBFS)	=	1.65E-03
Fc(Kr-85 add, bypass)	=	3.37E-05

Table VI-1 lists full core activity according to reference 10 multiplied by the above release fractions.

In CRADLE the option does not exist to input a plant specific source term. Therefore the above release fractions will be input into CRADLE. Tables VI-13 through VI-22 adjusts the doses based on a ratio between the CRADLE source term and the MP-2 specific source term.

Table VI-1

Instantaneous Release Activity

Radionuclide	Inventory	EBFS Release Fraction	EBFS Release Inventory	Bypass Release Fraction	Bypass Release Inventory
I-129	4.137E+00	9.92E-06	4.104E-05	2.02E-07	8.357E-07
I-130	5.101E+06	9.92E-06	5.060E+01	2.02E-07	1.030E+00
I-131	7.719E+07	9.92E-06	7.657E+02	2.02E-07	1.559E+01
I-132	1.105E+08	9.92E-06	1.096E+03	2.02E-07	2.232E+01
I-133	1.504E+08	9.92E-06	1.492E+03	2.02E-07	3.038E+01
I-134	1.666E+08	9.92E-06	1.653E+03	2.02E-07	3.365E+01
I-135	1.407E+08	9.92E-06	1.396E+03	2.02E-07	2.842E+01
Kr-83m	1.080E+07	8.27E-04	8.932E+03	1.69E-05	1.825E+02
Kr-85	1.194E+06	8.27E-04	9.874E+02	1.69E-05	2.018E+01
Kr-85m	2.451E+07	8.27E-04	2.027E+04	1.69E-05	4.142E+02
Kr-87	4.860E+07	8.27E-04	4.019E+04	1.69E-05	8.213E+02
Kr-88	6.865E+07	8.27E-04	5.677E+04	1.69E-05	1.160E+03
Kr-89	8.593E+07	8.27E-04	7.106E+04	1.69E-05	1.452E+03
Xe-131m	8.615E+05	8.27E-04	7.125E+02	1.69E-05	1.456E+01
Xe-133	1.569E+08	8.27E-04	1.298E+05	1.69E-05	2.652E+03
Xe-133m	4.808E+06	8.27E-04	3.976E+03	1.69E-05	8.126E+01
Xe-135	5.658E+07	8.27E-04	4.679E+04	1.69E-05	9.562E+02
Xe-135m	3.104E+07	8.27E-04	2.567E+04	1.69E-05	5.246E+02
Xe-137	1.316E+08	8.27E-04	1.088E+05	1.69E-05	2.224E+03
Xe-138	1.316E+08	8.27E-04	1.088E+05	1.69E-05	2.224E+03
Kr-85 (20%)	1.194E+06	1.65E-03	1.970E+03	3.37E-05	4.024E+01

B. Control Room

The control room is isolated within 10 seconds after a FHA. The methodology of Reference 25 will be used to calculate the MP2 control building inlet monitor response time to ensure the 10 second assumption is valid. As can be seen in computer output run job #11657, dated August 14, 1998, all the activity is removed from Node 1 (Aux Bldg) prior to control room isolation at 10 seconds after the FHA.

Duration of release: 10 sec

Conc. to DR Factor: 9.0E-3 uCi/cc / mr/hr Xe-133 EQ (ref. 21)

X/Q: 2.51E-4 sec/m3

Xe-133 EQ Conc.: product sum of activity released over 10 sec times the ave. gamma energy per isotope times the dispersion factor divided by the ave. gamma energy of Xe-133 (information from Table VI-A below)

Xe-133 EQ Conc.: 4090 Ci-Mev/dis ÷ 4.519E-2 Mev/dis ÷ 10 sec * 2.51E-4 sec/m3
2.272 uCi/cc (ave conc over 10 sec release)

Dose Rate (Cs): 1 mr/hr set point (ref. 21)

Dose Rate (Cf): Xe-133 EQ Conc. / conc. to dose conversion factor 252.4 mr/hr

RC: 0.0033

Response Time: Cs/Cf = 1 - exp(-T/RC)

Response Time: 1.3E-5 sec

Therefore assuming an isolation time of 10 seconds is conservative

Table VI-A

MP2 Control Room Monitor Response

	t = 72 hrs - 72 hrs, 10 sec Activity (Ci)	(Ref. 25) Ave Eng (MeV/dis)	Product
Kr-83m	4.04E-08	2.56E-03	1.03E-10
Kr-85	9.34E+02	2.23E-03	2.08E+00
Kr-85m	3.13E-01	1.58E-01	4.93E-02
Kr-87	1.16E-12	7.83E-01	9.10E-13
Kr-88	1.09E-03	1.94E+00	2.12E-03
Kr-89	0.00E+00	1.68E+00	0.00E+00
Xe-131m	4.97E+02	2.01E-02	9.98E+00
Xe-133m	1.28E+03	4.15E-02	5.29E+01
Xe-133	8.64E+04	4.52E-02	3.90E+03
Xe-135m	0.00E+00	4.31E-01	0.00E+00
Xe-135	5.15E+02	2.47E-01	1.27E+02
Xe-137	0.00E+00	1.70E-01	0.00E+00
Xe-138	0.00E+00	1.10E+00	0.00E+00
Total	8.96E+04		4.09E+03

The recirculation flow through the control room filters occurs at 10 minutes after isolation. The control room cleanup rate is calculated using the following equation.

$$CUR = \frac{FR \times Eff}{CRV} \times 60 \text{ min/hr}$$

where, CUR = Clean up rate (/hr)
FR = Flow rate through filters (2250 cfm)
Eff = Control room charcoal efficiency (90%)
CRV = Control Room volume (35,650 ft3)
CUR = 3.408/hr

C. Computer Code Input Data Sets

The input data sets to the TACT III (version 83.0) computer code are given in Tables VI-2 thru VI-5. The input data sets to the CRADLE computer code are given in Tables VI-6 thru VI-9.

Table VI-2

```
****************************** Top of Data ******************************
MP2 FHA; 12% IODINES, 10% NOBLE GASSES; EBFS
1  1 1 19 6 27 98 0 0
2754. 0.0     9.92E-6 8.27E-4 0.0      7.50E-1 2.50E-1 0.0
1  2 0  7.200E+01  7.400E+01
2  1 1  4.104E-05
2  1 2  7.657E+02
2  1 3  1.096E+03
2  1 4  1.492E+03
2  1 5  1.653E+03
2  1 6  1.396E+03
2  1 8  5.060E+01
2  1 9  8.932E+03
2  1 10 2.027E+04
2  1 11 9.874E+02
2  1 12 4.019E+04
2  1 13 5.677E+04
2  1 14 7.106E+04
2  1 15 7.125E+02
2  1 16 3.976E+03
2  1 17 1.298E+05
2  1 18 2.567E+04
2  1 19 4.679E+04
2  1 20 1.088E+05
2  1 21 1.088E+05
3  1 0  1.000E+03
10 2 1  1.000E+05  0.0
12 2 1  9.000E+01  0.0
13 2 1  7.000E+01  0.0
17 6 0  1.000E-04  2.690E-05  3.470E-04  0.0  0.0  0.000E+00
0/
***************************** Bottom of Data ****************************
```

Table VI-3

```
****************************** Top of Data ******************************
MP2 FHA; 12% IODINES, 10% NOBLE GASSES; BYPASS
1  1 1 19 6 27 98 0 0
2754. 0.0     2.02E-7 1.69E-5 0.0      7.50E-1 2.50E-1 0.0
1  2 0  7.200E+01  7.400E+01
2  1 1  8.357E-07
2  1 2  1.559E+01
2  1 3  2.232E+01
2  1 4  3.038E+01
2  1 5  3.365E+01
2  1 6  2.842E+01
2  1 8  1.030E+00
2  1 9  1.825E+02
2  1 10 4.142E+02
2  1 11 2.018E+01
2  1 12 8.213E+02
2  1 13 1.160E+03
2  1 14 1.452E+03
2  1 15 1.456E+01
2  1 16 8.126E+01
2  1 17 2.652E+03
2  1 18 5.246E+02
2  1 19 9.562E+02
2  1 20 2.224E+03
2  1 21 2.224E+03
3  1 0  1.000E+03
10 2 1  1.000E+05  0.0
17 6 0  3.660E-04  4.800E-05  3.470E-04  0.0  0.0  0.000E+00
0/
***************************** Bottom of Data ******************************
```

Table VI-4

```
****************************** Top of Data ******************************
MP2 FHA; 20% KR-85S; EBFS
1 1 11 11 6 27 98 0 0
2754. 0.0          0.0 1.65E-3 0.0          0.0      0.0 0.0
1  2 0  7.200E+01  7.400E+01
2  1 11 1.970E+03
3  1 0  1.000E+03
10 2 1  1.000E+05  0.0
17 6 0  1.000E-04  2.690E-05  3.470E-04  0.0  0.0  0.000E+00
0/
***************************** Bottom of Data ****************************
```

Table VI-5

```
****************************** Top of Data ******************************
MP2 FHA; 20% KR-85; BYPASS
1 1 11 11 6 27 98 0 0
2754. 0.0          0.0 3.37E-5 0.0          0.0      0.0 0.0
1  2 0  7.200E+01  7.400E+01 0
2  1 11 4.024E+01
3  1 0  1.000E+03
10 2 1  1.000E+05  0.0
17 6 0  3.660E-04  4.800E-05  3.470E-04  0.0  0.0  0.000E+00
0/
***************************** Bottom of Data ****************************
```

Table VI-6

```
****************************** Top of Data ******************************
 MP-2 CR FROM FILTERED FHA (12% I; 10% NG)                                1
     2754.  3.565E+4        1.         0         9
       0.0      72.0   72.0028    72.167      74.0      76.0      80.0
      96.0     168.0     792.0
   9.92E-6   8.27E-4
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0     130.0     130.0     130.0     130.0
     130.0     130.0
       0.0       0.0       0.0       0.0       0.0       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0     130.0     130.0     130.0     130.0
     130.0     130.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
       0.0   2.51E-4   2.51E-4   2.51E-4   2.51E-4   1.96E-5   5.46E-6
   3.43E-7   6.44E-9
       0.0   1.0E+10   1.0E+10   1.0E+10       0.0       0.0       0.0
       0.0       0.0
      90.0      70.0      90.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
***************************** Bottom of Data ******************************
```

Table VI-7

```
****************************** Top of Data ******************************
 MP-2 CR FROM FILTERED FHA (20% KR-85 ONLY)                              1
     2754.  3.565E+4        1.         0         9
       0.0      72.0   72.0028    72.167      74.0      76.0      80.0
      96.0     168.0     792.0
       0.0   1.65E-3
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0     130.0     130.0     130.0     130.0
     130.0     130.0
       0.0       0.0       0.0       0.0       0.0       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0     130.0     130.0     130.0     130.0
     130.0     130.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
       0.0   2.51E-4   2.51E-4   2.51E-4   2.51E-4   1.96E-5   5.46E-6
   3.43E-7   6.44E-9
       0.0   1.0E+10   1.0E+10   1.0E+10       0.0       0.0       0.0
       0.0       0.0
      90.0      70.0      90.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
*************************** Bottom of Data ***************************
```

Table VI-8

```
****************************** Top of Data ******************************
 MP-2 CR FROM BYPASS   FHA (12% I; 10% NG)                                1
     2754.  3.565E+4        1.          0          9
       0.0      72.0   72.0028     72.167       74.0       76.0       80.0
      96.0     168.0     792.0
   2.02E-7   1.69E-5
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0      130.0      130.0      130.0      130.0
     130.0     130.0
       0.0       0.0       0.0        0.0        0.0        0.0        0.0
       0.0       0.0
     800.0     800.0     130.0      130.0      130.0      130.0      130.0
     130.0     130.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
       0.0   5.46E-3   5.46E-3    5.46E-3    5.46E-3    5.46E-3    3.45E-3
   1.23E-3   3.98E-4
       0.0   1.0E+10   1.0E+10    1.0E+10        0.0        0.0        0.0
       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
****************************** Bottom of Data ******************************
```

Table VI-9

```
****************************** Top of Data ******************************
 MP-2 CR FROM BYPASS   FHA (20% KR-85 ONLY)                              1
     2754.  3.565E+4        1.          0          9
       0.0      72.0   72.0028     72.167       74.0       76.0       80.0
      96.0     168.0     792.0
       0.0   3.37E-5
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
       0.0       0.0
     800.0     800.0     130.0      130.0      130.0      130.0      130.0
     130.0     130.0
       0.0       0.0       0.0        0.0        0.0        0.0        0.0
       0.0       0.0
     800.0     800.0     130.0      130.0      130.0      130.0      130.0
     130.0     130.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
     3.408     3.408     3.408
       0.0   5.46E-3   5.46E-3    5.46E-3    5.46E-3    5.46E-3    3.45E-3
   1.27E-3   3.98E-4
       0.0   1.0E+10   1.0E+10    1.0E+10        0.0        0.0        0.0
       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
       0.0       0.0       0.0
***************************** Bottom of Data ****************************
```

D. Results of Computer Runs

TACT III iodine thyroid results will be adjusted using the ICRP 30 thyroid dose conversion factors by utilizing the equation given below.

$$D_{Thy_i}^{ICRP30} = D_{Thy_i}^{TACT} * F_i * R_i$$

where,

$D_{Thy_i}^{ICRP30}$ = Thyroid dose for isotope i adjusted for ICRP 30 DCF's.

$D_{Thy_i}^{TACT}$ = Total Thyroid dose from TACT III for isotope i

F_i = Fraction of total iodine.

R_i = Ratio of ICRP 30 to TACT III dose conversion factors (see Table VI-10).

The TACT III input data sets in Table VI-2 thru 5 were run on the Wethersfield IBM 3090 mainframe computer. The thyroid doses adjusted for ICRP 30 DCF's in each time interval are listed in Table VI-12 with corresponding data. The summary of both thyroid and whole body dose results appear in Table II-1 and II-2. The TACT III results are given in computer output job number 9727, dated July 14, 1998 for the bypass release, 9731, dated July 14, 1998 for Kr-85 EBFS release, 9734, dated July 14, 1998 for the Kr-85 bypass release and 7778, dated July 14, 1998 for the EBFS release.

TABLE VI-10

THYROID DOSE CONVERSION FACTORS
(rem/Ci - inhaled)

ISOTOPE	TACT III	ICRP 30 *	DCF RATIO (ICRP 30/TACT III)
I-129	5.54E+6	5.920E+6	1.068
I-130	1.42E+5	7.400E+4	0.521
I-131	1.49E+6	1.073E+6	0.718
I-132	1.43E+4	6.290E+3	0.440
I-133	2.69E+5	1.813E+5	0.674
I-134	3.73E+3	1.073E+3	0.288
I-135	5.60E+4	3.145E+4	0.562

Notes: * 3.7E+12 used to convert from Sv/Bq to rem/Ci.

The results from CRADLE must be adjusted for thyroid dose as described above. The results also must be adjusted for the difference in the source term. Since CRADLE does not have an option to input a plant specific source term, another

ratio must be calculated. The ratio will be the total source as calculated in reference 12 to the total source as listed in reference 22 (CRADLE). The doses per time step will be multiplied by this ratio and then summed. The ratios are listed and calculated in Table VI-11 below.

Table VI-11

	Ref. 12 (NUC-181) Full Core Activity	Ref. 24 (CRADLE) Full Core Activity	Ratio
I-131	7.72E+07	6.91E+07	1.1177
I-132	1.11E+08	1.05E+08	1.0544
I-133	1.50E+08	1.55E+08	0.9714
I-134	1.67E+08	1.81E+08	0.9201
I-135	1.41E+08	1.41E+08	1.0013
Kr-83M	1.08E+07	1.14E+07	0.9445
Kr-85	1.19E+06	1.13E+06	1.0569
Kr-85M	2.45E+07	3.57E+07	0.6862
Kr-87	4.86E+07	6.43E+07	0.7558
Kr-88	6.87E+07	8.81E+07	0.7790
Kr-89	8.59E+07	1.10E+08	0.7842
Xe-131M	8.62E+05	7.15E+05	1.2055
Xe-133M	4.81E+06	3.81E+06	1.2614
Xe-133	1.57E+08	1.55E+08	1.0134
Xe-135M	3.10E+07	4.29E+07	0.7239
Xe-135	5.66E+07	1.48E+08	0.3831
Xe-137	1.32E+08	1.41E+08	0.9364
Xe-138	1.32E+08	1.32E+08	1.0007

The CRADLE input data sets in Table V1-6 through 9 were run on the Wethersfield IBM 3090 mainframe computer. The thyroid doses adjusted for ICRP 30 DCF's in each time interval is listed in Table VI-13 and 20 with corresponding data. The thyroid, beta skin and whole body doses adjusted for the source term correction in each time interval, using the ratios developed in Table VI-1, are listed in Tables VI-13 through 22 with corresponding data. The summary of thyroid, beta skin and whole body dose results appear in Table II-3. The CRADLE results are given in computer output job number 11674, dated Aug. 4, 1998 for the bypass release, 1166, dated Aug. 4, 1998 for Kr-85 EBFS release, 11688, dated Aug. 4, 1998 for the Kr-85 bypass release and 11657, dated Aug. 4, 1998 for the EBFS release.

TABLE VI-12

EBFS and Bypass Leakage

DCF Ratio						
I-129	I-130	I-131	I-132	I-133	I-134	I-135
1.068	0.521	0.718	0.440	0.674	0.288	0.562

	TACT III Iodine Dose Fraction							*Combined*
Release Type	**I-129**	**I-130**	**I-131**	**I-132**	**I-133**	**I-134**	**I-135**	***Factor***
EBFS	2.48E-07	1.380E-04	9.596E-01	8.563E-12	4.026E-02	1.153E-27	5.120E-05	*7.1623E-01*
Bypass	2.48E-07	1.379E-04	9.596E-01	8.565E-12	4.026E-02	1.152E-27	5.120E-05	*7.1623E-01*

Combined Factor(t) = Summation of [DCF Ratio(i) x Iodine Dose Fraction(i)] over i for time interval (t), where i=iodine isotope.

		Filtered Release Thyroid Doses (Rem)			
		TACT III		***ICRP 30***	
Release Type		**EAB**	**LPZ**	***EAB***	***LPZ***
EBFS		4.780E+00	1.286E+00	*3.424E+00*	*9.211E-01*
Bypass		2.375E+00	3.115E-01	*1.701E+00*	*2.231E-01*
				5.125E+00	*1.144E+00*

ICRP 30 EAB(t), or LPZ(t) = TACT III EAB(t), or LPZ(t), x Combined Factor(t) for time interval (t).

SUBJECT	MP-2 Fuel Handling	BY	JLW	DATE	8/4/98
	Accident in the Spent	CHKED		DATE	
	Fuel Pool with 2% EBFS	CALC #	96RAD	1378R2	
	Bypass, Rev. 2	SHEET	22	OF	31

Table VI-13

SOURCE TERM CORRECTION TO BETA DOSE RESULTS

EBFS Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	2.00E-06	1.15E-04	1.89E-04	2.44E-07	1.71E-10	8.45E-17	5.02E-42	0.00E+00	3.06E-04	3.42E-04
I-132 ELEM	1.0544	0.00E+00	4.47E-15	2.51E-13	3.73E-13	2.81E-16	1.10E-19	1.67E-26	9.00E-54	0.00E+00	6.29E-13	6.63E-13
I-133 ELEM	0.9714	0.00E+00	1.26E-06	7.22E-05	1.18E-04	1.43E-07	9.51E-11	4.17E-17	1.54E-42	0.00E+00	1.91E-04	1.86E-04
I-134 ELEM	0.9201	0.00E+00	3.65E-30	1.97E-28	2.49E-28	7.57E-32	1.10E-35	2.32E-43	4.57E-74	0.00E+00	4.50E-28	4.14E-28
I-135 ELEM	1.0013	0.00E+00	5.11E-09	2.91E-07	4.62E-07	4.97E-10	2.86E-13	9.49E-20	1.15E-45	0.00E+00	7.59E-07	7.60E-07
I-131 ORG.	1.1177	0.00E+00	2.64E-07	1.51E-05	2.49E-05	3.21E-08	2.26E-11	1.11E-17	6.62E-43	0.00E+00	4.03E-05	4.51E-05
I-132 ORG.	1.0544	0.00E+00	5.90E-16	3.31E-14	4.92E-14	3.70E-17	1.44E-20	2.20E-27	1.19E-54	0.00E+00	8.29E-14	8.74E-14
I-133 ORG.	0.9714	0.00E+00	1.66E-07	9.52E-06	1.55E-05	1.89E-08	1.25E-11	5.50E-18	2.04E-43	0.00E+00	2.52E-05	2.45E-05
I-134 ORG.	0.9201	0.00E+00	4.82E-31	2.60E-29	3.29E-29	9.99E-33	1.45E-36	3.06E-44	6.03E-75	0.00E+00	5.93E-29	5.46E-29
I-135 ORG.	1.0013	0.00E+00	6.73E-10	3.84E-08	6.10E-08	6.55E-11	3.77E-14	1.25E-20	1.51E-46	0.00E+00	1.00E-07	1.00E-07
I-131 PART.	1.1177	0.00E+00	1.10E-07	6.31E-06	1.04E-05	1.34E-08	9.41E-12	4.64E-18	2.76E-43	0.00E+00	1.68E-05	1.88E-05
I-132 PART.	1.0544	0.00E+00	2.46E-16	1.38E-14	2.05E-14	1.54E-17	6.02E-21	9.17E-28	4.95E-55	0.00E+00	3.45E-14	3.64E-14
I-133 PART.	0.9714	0.00E+00	6.92E-08	3.97E-06	6.45E-06	7.88E-09	5.22E-12	2.29E-18	8.48E-44	0.00E+00	1.05E-05	1.02E-05
I-134 PART.	0.9201	0.00E+00	2.01E-31	1.08E-29	1.37E-29	4.16E-33	6.04E-37	1.27E-44	2.51E-75	0.00E+00	2.47E-29	2.27E-29
I-135 PART.	1.0013	0.00E+00	2.81E-10	1.60E-08	2.54E-08	2.73E-11	1.57E-14	5.22E-21	6.31E-47	0.00E+00	4.17E-08	4.18E-08
KR-85	1.0569	0.00E+00	3.75E-05	2.16E-03	1.95E-02	1.40E-02	1.49E-02	1.03E-02	3.20E-04	4.61E-11	6.11E-02	6.46E-02
KR-85M	0.6862	0.00E+00	1.37E-08	7.78E-07	6.07E-06	3.22E-06	2.23E-06	6.28E-07	1.49E-09	2.27E-21	1.29E-05	8.88E-06
KR-87	0.7558	0.00E+00	3.38E-19	1.86E-17	1.06E-16	2.78E-17	7.56E-18	3.93E-19	2.36E-24	7.42E-48	1.61E-16	1.21E-16
KR-88	0.7790	0.00E+00	7.78E-11	4.38E-09	3.16E-08	1.41E-08	7.68E-09	1.39E-09	7.65E-13	1.65E-27	5.92E-08	4.61E-08
KR-89	0.7842	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-131M	1.2055	0.00E+00	7.08E-06	4.07E-04	3.67E-03	2.62E-03	2.77E-03	1.89E-03	5.65E-05	6.84E-12	1.14E-02	1.38E-02
XE-133M	1.2614	0.00E+00	3.78E-05	2.17E-03	1.94E-02	1.36E-02	1.40E-02	8.94E-03	2.26E-04	1.32E-11	5.83E-02	7.36E-02
XE-133	1.0134	0.00E+00	7.91E-04	4.54E-02	4.08E-01	2.90E-01	3.04E-01	2.03E-01	5.78E-03	5.62E-10	1.26E+00	1.27E+00
XE-135M	0.7239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-135	0.3831	0.00E+00	2.86E-05	1.64E-03	1.38E-02	8.56E-03	7.38E-03	3.25E-03	2.93E-05	1.78E-14	3.47E-02	1.33E-02
XE-137	0.9364	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	1.0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
											Total	1.44E+00

Table VI-14

SOURCE TERM CORRECTION TO WHOLE BODY DOSE RESULTS

EBFS Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	4.44E-06	2.55E-04	4.19E-04	5.40E-07	3.80E-10	1.88E-16	1.11E-41	0.00E+00	6.79E-04	7.59E-04
I-132 ELEM	1.0544	0.00E+00	2.23E-14	1.25E-12	1.86E-12	1.40E-15	5.47E-19	8.33E-26	4.49E-53	0.00E+00	3.14E-12	3.31E-12
I-133 ELEM	0.9714	0.00E+00	1.35E-06	7.74E-05	1.26E-04	1.54E-07	1.02E-10	4.47E-17	1.66E-42	0.00E+00	2.05E-04	1.99E-04
I-134 ELEM	0.9201	0.00E+00	8.41E-30	4.53E-28	5.74E-28	1.74E-31	2.53E-35	5.33E-43	1.05E-73	0.00E+00	1.04E-27	9.52E-28
I-135 ELEM	1.0013	0.00E+00	2.77E-08	1.58E-06	2.51E-06	2.70E-09	1.56E-12	5.16E-19	6.24E-45	0.00E+00	4.12E-06	4.13E-06
I-131 ORG.	1.1177	0.00E+00	5.85E-07	3.36E-05	5.53E-05	7.13E-08	5.01E-11	2.47E-17	1.47E-42	0.00E+00	8.96E-05	1.00E-04
I-132 ORG.	1.0544	0.00E+00	2.94E-15	1.65E-13	2.45E-13	1.85E-16	7.21E-20	1.10E-26	5.92E-54	0.00E+00	4.14E-13	4.36E-13
I-133 ORG.	0.9714	0.00E+00	1.78E-07	1.02E-05	1.66E-05	2.03E-08	1.34E-11	5.90E-18	2.18E-43	0.00E+00	2.70E-05	2.62E-05
I-134 ORG.	0.9201	0.00E+00	1.11E-30	5.97E-29	7.57E-29	2.30E-32	3.34E-36	7.03E-44	1.39E-74	0.00E+00	1.37E-28	1.26E-28
I-135 ORG.	1.0013	0.00E+00	3.66E-09	2.09E-07	3.31E-07	3.56E-10	2.05E-13	6.80E-20	8.23E-46	0.00E+00	5.44E-07	5.45E-07
I-131 PART.	1.1177	0.00E+00	2.44E-07	1.40E-05	2.30E-05	2.97E-08	2.09E-11	1.03E-17	6.12E-43	0.00E+00	3.73E-05	4.17E-05
I-132 PART.	1.0544	0.00E+00	1.23E-15	6.88E-14	1.02E-13	7.69E-17	3.00E-20	4.58E-27	2.47E-54	0.00E+00	1.72E-13	1.82E-13
I-133 PART.	0.9714	0.00E+00	7.42E-08	4.25E-06	6.92E-06	8.45E-09	5.60E-12	2.46E-18	9.09E-44	0.00E+00	1.13E-05	1.09E-05
I-134 PART.	0.9201	0.00E+00	4.62E-31	2.49E-29	3.15E-29	9.58E-33	1.39E-36	2.93E-44	5.78E-75	0.00E+00	5.69E-29	5.23E-29
I-135 PART.	1.0013	0.00E+00	1.53E-09	8.69E-08	1.38E-07	1.48E-10	8.55E-14	2.83E-20	3.43E-46	0.00E+00	2.27E-07	2.27E-07
KR-83M	0.9445	0.00E+00	2.36E-17	1.32E-15	8.62E-15	3.11E-15	1.27E-15	1.37E-16	1.23E-20	7.58E-39	1.45E-14	1.37E-14
KR-85	1.0569	0.00E+00	4.85E-07	2.79E-05	2.52E-04	1.81E-04	1.92E-04	1.33E-04	4.14E-06	5.97E-13	7.91E-04	8.36E-04
KR-85M	0.6862	0.00E+00	1.18E-08	6.67E-07	5.20E-06	2.76E-06	1.91E-06	5.38E-07	1.28E-09	1.95E-21	1.11E-05	7.61E-06
KR-87	0.7558	0.00E+00	2.56E-19	1.41E-17	8.02E-17	2.10E-17	5.72E-18	2.98E-19	1.78E-24	5.61E-48	1.22E-16	9.19E-17
KR-88	0.7790	0.00E+00	5.63E-10	3.17E-08	2.28E-07	1.02E-07	5.56E-08	1.01E-08	5.54E-12	1.20E-26	4.28E-07	3.34E-07
KR-89	0.7842	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-131M	1.2055	0.00E+00	2.36E-06	1.36E-04	1.22E-03	8.74E-04	9.22E-04	6.29E-04	1.88E-05	2.28E-12	3.80E-03	4.59E-03
XE-133M	1.2614	0.00E+00	1.27E-05	7.27E-04	6.49E-03	4.55E-03	4.67E-03	2.99E-03	7.57E-05	4.41E-12	1.95E-02	2.46E-02
XE-133	1.0134	0.00E+00	9.26E-04	5.32E-02	4.78E-01	3.40E-01	3.56E-01	2.38E-01	6.77E-03	6.57E-10	1.47E+00	1.49E+00
XE-135M	0.7239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-135	0.3831	0.00E+00	3.00E-05	1.72E-03	1.44E-02	8.98E-03	7.74E-03	3.41E-03	3.08E-05	1.87E-14	3.63E-02	1.39E-02
XE-137	0.9364	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	1.0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
											1.53E+00	1.54E+00
											4.89E-02	4.90E-02

Table VI-15

SOURCE TERM CORRECTION TO THYROID DOSE RESULTS

EBFS Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	2.35E-02	1.35E+00	2.22E+00	2.87E-03	2.02E-06	9.95E-13	5.91E-38	0.00E+00	3.60E+00	4.03E+00
I-132 ELEM	1.0544	0.00E+00	2.22E-13	1.25E-11	1.85E-11	1.39E-14	5.45E-18	8.30E-25	4.48E-52	0.00E+00	3.13E-11	3.30E-11
I-133 ELEM	0.9714	0.00E+00	1.14E-03	6.51E-02	1.06E-01	1.29E-04	8.57E-08	3.76E-14	1.39E-39	0.00E+00	1.72E-01	1.67E-01
I-134 ELEM	0.9201	0.00E+00	3.43E-29	1.85E-27	2.34E-27	7.10E-31	1.03E-34	2.17E-42	4.29E-73	0.00E+00	4.22E-27	3.88E-27
I-135 ELEM	1.0013	0.00E+00	1.40E-06	7.98E-05	1.27E-04	1.36E-07	7.85E-11	2.60E-17	3.15E-43	0.00E+00	2.08E-04	2.08E-04
I-131 ORG.	1.1177	0.00E+00	3.10E-03	1.78E-01	2.93E-01	3.78E-04	2.66E-07	1.31E-13	7.79E-39	0.00E+00	4.75E-01	5.31E-01
I-132 ORG.	1.0544	0.00E+00	2.93E-14	1.65E-12	2.44E-12	1.84E-15	7.18E-19	1.09E-25	5.90E-53	0.00E+00	4.12E-12	4.34E-12
I-133 ORG.	0.9714	0.00E+00	1.50E-04	8.58E-03	1.40E-02	1.71E-05	1.13E-08	4.96E-15	1.84E-40	0.00E+00	2.27E-02	2.21E-02
I-134 ORG.	0.9201	0.00E+00	4.52E-30	2.44E-28	3.08E-28	9.37E-32	1.36E-35	2.87E-43	5.65E-74	0.00E+00	5.57E-28	5.12E-28
I-135 ORG.	1.0013	0.00E+00	1.85E-07	1.05E-05	1.67E-05	1.80E-08	1.04E-11	3.43E-18	4.15E-44	0.00E+00	2.75E-05	2.75E-05
I-131 PART.	1.1177	0.00E+00	1.29E-03	7.43E-02	1.22E-01	1.58E-04	1.11E-07	5.47E-14	3.25E-39	0.00E+00	1.98E-01	2.21E-01
I-132 PART.	1.0544	0.00E+00	1.22E-14	6.86E-13	1.02E-12	7.66E-16	2.99E-19	4.56E-26	2.46E-53	0.00E+00	1.72E-12	1.81E-12
I-133 PART.	0.9714	0.00E+00	6.24E-05	3.58E-03	5.82E-03	7.11E-06	4.71E-09	2.07E-15	7.65E-41	0.00E+00	9.47E-03	9.20E-03
I-134 PART.	0.9201	0.00E+00	1.88E-30	1.02E-28	1.29E-28	3.90E-32	5.67E-36	1.19E-43	2.36E-74	0.00E+00	2.32E-28	2.13E-28
I-135 PART.	1.0013	0.00E+00	7.70E-08	4.39E-06	6.97E-06	7.49E-09	4.31E-12	1.43E-18	1.73E-44	0.00E+00	1.14E-05	1.15E-05
											Total	4.98E+00

	Corrected Dose (rem)	R.G. 1.109 to ICRP 30 DCF Corr.	Inventory Adjust	Total Corrected Dose (rem)
I-131 ELEM	4.03E+00	7.18E-01	8.24E-01	2.38E+00
I-132 ELEM	3.30E-11	4.40E-01	8.24E-01	1.20E-11
I-133 ELEM	1.67E-01	6.74E-01	8.24E-01	9.29E-02
I-134 ELEM	3.88E-27	2.88E-01	8.24E-01	9.22E-28
I-135 ELEM	2.08E-04	5.62E-01	8.24E-01	9.65E-05
I-131 ORG.	5.31E-01	7.18E-01	6.25E+00	2.38E+00
I-132 ORG.	4.34E-12	4.40E-01	6.25E+00	1.19E-11
I-133 ORG.	2.21E-02	6.74E-01	6.25E+00	9.30E-02
I-134 ORG.	5.12E-28	2.88E-01	6.25E+00	9.22E-28
I-135 ORG.	2.75E-05	5.62E-01	6.25E+00	9.66E-05
I-131 PART.	2.21E-01	7.18E-01	0.00E+00	0.00E+00
I-132 PART.	1.81E-12	4.40E-01	0.00E+00	0.00E+00
I-133 PART.	9.20E-03	6.74E-01	0.00E+00	0.00E+00
I-134 PART.	2.13E-28	2.88E-01	0.00E+00	0.00E+00
I-135 PART.	1.15E-05	5.62E-01	0.00E+00	0.00E+00
			Total:	4.95E+00

Table VI-16

SOURCE TERM CORRECTION TO BETA DOSE RESULTS

EBFS Portion (20% Kr-85)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
KR-85	1.0569	0.00E+00	7.48E-05	4.30E-03	3.88E-02	2.79E-02	2.96E-02	2.05E-02	6.39E-04	9.20E-11	1.22E-01	1.29E-01
											Total	1.29E-01

Table VI-17

SOURCE TERM CORRECTION TO WHOLE BODY DOSE RESULTS

EBFS Portion (20% Kr-85)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
KR-85	1.0569	0.00E+00	9.68E-07	5.56E-05	5.03E-04	3.61E-04	3.84E-04	2.66E-04	8.27E-06	1.19E-12	1.58E-03	1.67E-03
											Total	1.67E-03

Table VI-18

SOURCE TERM CORRECTION TO BETA DOSE RESULTS

Bypass Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	8.85E-06	5.09E-04	8.37E-04	1.08E-06	7.58E-10	3.74E-16	2.22E-41	0.00E+00	1.36E-03	1.51E-03
I-132 ELEM	1.0544	0.00E+00	1.98E-14	1.11E-12	1.65E-12	1.24E-15	4.85E-19	7.39E-26	3.99E-53	0.00E+00	2.79E-12	2.94E-12
I-133 ELEM	0.9714	0.00E+00	5.58E-06	3.20E-04	5.20E-04	6.35E-07	4.21E-10	1.85E-16	6.84E-42	0.00E+00	8.46E-04	8.22E-04
I-134 ELEM	0.9201	0.00E+00	1.62E-29	8.72E-28	1.10E-27	3.35E-31	4.87E-35	1.03E-42	2.03E-73	0.00E+00	1.99E-27	1.83E-27
I-135 ELEM	1.0013	0.00E+00	2.26E-08	1.29E-06	2.05E-06	2.20E-09	1.27E-12	4.20E-19	5.09E-45	0.00E+00	3.36E-06	3.37E-06
I-131 ORG.	1.1177	0.00E+00	3.89E-07	2.24E-05	3.68E-05	4.74E-08	3.33E-11	1.65E-17	9.77E-43	0.00E+00	5.96E-05	6.66E-05
I-132 ORG.	1.0544	0.00E+00	8.71E-16	4.89E-14	7.26E-14	5.46E-17	2.13E-20	3.25E-27	1.75E-54	0.00E+00	1.22E-13	1.29E-13
I-133 ORG.	0.9714	0.00E+00	2.45E-07	1.41E-05	2.29E-05	2.79E-08	1.85E-11	8.12E-18	3.01E-43	0.00E+00	3.72E-05	3.61E-05
I-134 ORG.	0.9201	0.00E+00	7.12E-31	3.83E-29	4.86E-29	1.47E-32	2.14E-36	4.51E-44	8.90E-75	0.00E+00	8.76E-29	8.06E-29
I-135 ORG.	1.0013	0.00E+00	9.94E-10	5.67E-08	9.00E-08	9.67E-11	5.57E-14	1.85E-20	2.24E-46	0.00E+00	1.48E-07	1.48E-07
I-131 PART.	1.1177	0.00E+00	4.86E-07	2.80E-05	4.60E-05	5.93E-08	4.17E-11	2.06E-17	1.22E-42	0.00E+00	7.45E-05	8.32E-05
I-132 PART.	1.0544	0.00E+00	1.09E-15	6.11E-14	9.08E-14	6.83E-17	2.67E-20	4.06E-27	2.19E-54	0.00E+00	1.53E-13	1.61E-13
I-133 PART.	0.9714	0.00E+00	3.06E-07	1.76E-05	2.86E-05	3.49E-08	2.31E-11	1.02E-17	3.76E-43	0.00E+00	4.65E-05	4.52E-05
I-134 PART.	0.9201	0.00E+00	8.90E-31	4.79E-29	6.07E-29	1.84E-32	2.68E-36	5.64E-44	1.11E-74	0.00E+00	1.10E-28	1.01E-28
I-135 PART.	1.0013	0.00E+00	1.24E-09	7.08E-08	1.13E-07	1.21E-10	6.97E-14	2.31E-20	2.80E-46	0.00E+00	1.85E-07	1.85E-07
KR-85	1.0569	0.00E+00	1.67E-05	9.58E-04	8.65E-03	6.22E-03	6.60E-03	4.58E-03	1.42E-04	2.05E-11	2.72E-02	2.87E-02
KR-85M	0.6862	0.00E+00	6.09E-09	3.46E-07	2.70E-06	1.43E-06	9.89E-07	2.79E-07	6.62E-10	1.01E-21	5.75E-06	3.95E-06
KR-87	0.7558	0.00E+00	1.50E-19	8.28E-18	4.71E-17	1.24E-17	3.36E-18	1.75E-19	1.05E-24	3.30E-48	7.14E-17	5.40E-17
KR-88	0.7790	0.00E+00	3.46E-11	1.95E-09	1.40E-08	6.27E-09	3.41E-09	6.17E-10	3.40E-13	7.35E-28	2.63E-08	2.05E-08
KR-89	0.7842	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-131M	1.2055	0.00E+00	3.15E-06	1.81E-04	1.63E-03	1.17E-03	1.23E-03	8.40E-04	2.51E-05	3.04E-12	5.08E-03	6.12E-03
XE-133M	1.2614	0.00E+00	1.68E-05	9.66E-04	8.62E-03	6.05E-03	6.20E-03	3.97E-03	1.01E-04	5.86E-12	2.59E-02	3.27E-02
XE-133	1.0134	0.00E+00	3.52E-04	2.02E-02	1.82E-01	1.29E-01	1.35E-01	9.04E-02	2.57E-03	2.50E-10	5.59E-01	5.66E-01
XE-135M	0.7239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-135	0.3831	0.00E+00	1.27E-05	7.27E-04	6.12E-03	3.81E-03	3.28E-03	1.44E-03	1.30E-05	7.92E-15	1.54E-02	5.90E-03
XE-137	0.9364	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	1.0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
											Total	6.42E-01

Table VI-19

SOURCE TERM CORRECTION TO WHOLE BODY DOSE RESULTS

Bypass Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	1.96E-05	1.13E-03	1.86E-03	2.39E-06	1.68E-09	8.31E-16	4.93E-41	0.00E+00	3.01E-03	3.36E-03
I-132 ELEM	1.0544	0.00E+00	9.89E-14	5.55E-12	8.24E-12	6.20E-15	2.42E-18	3.69E-25	1.99E-52	0.00E+00	1.39E-11	1.46E-11
I-133 ELEM	0.9714	0.00E+00	5.98E-06	3.43E-04	5.58E-04	6.81E-07	4.52E-10	1.98E-16	7.33E-42	0.00E+00	9.07E-04	8.81E-04
I-134 ELEM	0.9201	0.00E+00	3.72E-29	2.01E-27	2.54E-27	7.72E-31	1.12E-34	2.36E-42	4.66E-73	0.00E+00	4.59E-27	4.22E-27
I-135 ELEM	1.0013	0.00E+00	1.23E-07	7.01E-06	1.11E-05	1.20E-08	6.89E-12	2.28E-18	2.76E-44	0.00E+00	1.83E-05	1.83E-05
I-131 ORG.	1.1177	0.00E+00	8.63E-07	4.96E-05	8.16E-05	1.05E-07	7.40E-11	3.65E-17	2.17E-42	0.00E+00	1.32E-04	1.48E-04
I-132 ORG.	1.0544	0.00E+00	4.35E-15	2.44E-13	3.62E-13	2.72E-16	1.06E-19	1.62E-26	8.75E-54	0.00E+00	6.11E-13	6.44E-13
I-133 ORG.	0.9714	0.00E+00	2.63E-07	1.51E-05	2.45E-05	3.00E-08	1.99E-11	8.71E-18	3.22E-43	0.00E+00	3.99E-05	3.88E-05
I-134 ORG.	0.9201	0.00E+00	1.64E-30	8.82E-29	1.12E-28	3.39E-32	4.93E-36	1.04E-43	2.05E-74	0.00E+00	2.02E-28	1.85E-28
I-135 ORG.	1.0013	0.00E+00	5.40E-09	3.08E-07	4.89E-07	5.25E-10	3.03E-13	1.00E-19	1.22E-45	0.00E+00	8.03E-07	8.04E-07
I-131 PART.	1.1177	0.00E+00	1.08E-06	6.20E-05	1.02E-04	1.32E-07	9.25E-11	4.57E-17	2.71E-42	0.00E+00	1.65E-04	1.85E-04
I-132 PART.	1.0544	0.00E+00	5.43E-15	3.05E-13	4.53E-13	3.41E-16	1.33E-19	2.03E-26	1.09E-53	0.00E+00	7.63E-13	8.05E-13
I-133 PART.	0.9714	0.00E+00	3.29E-07	1.88E-05	3.07E-05	3.74E-08	2.48E-11	1.09E-17	4.03E-43	0.00E+00	4.99E-05	4.84E-05
I-134 PART.	0.9201	0.00E+00	2.05E-30	1.10E-28	1.40E-28	4.24E-32	6.16E-36	1.30E-43	2.56E-74	0.00E+00	2.52E-28	2.32E-28
I-135 PART.	1.0013	0.00E+00	6.75E-09	3.85E-07	6.12E-07	6.57E-10	3.79E-13	1.26E-19	1.52E-45	0.00E+00	1.00E-06	1.01E-06
KR-83M	0.9445	0.00E+00	1.05E-17	5.86E-16	3.83E-15	1.38E-15	5.66E-16	6.10E-17	5.48E-21	3.37E-39	6.44E-15	6.08E-15
KR-85	1.0569	0.00E+00	2.16E-07	1.24E-05	1.12E-04	8.04E-05	8.54E-05	5.92E-05	1.84E-06	2.65E-13	3.52E-04	3.72E-04
KR-85M	0.6862	0.00E+00	5.22E-09	2.96E-07	2.31E-06	1.23E-06	8.48E-07	2.39E-07	5.68E-10	8.66E-22	4.93E-06	3.38E-06
KR-87	0.7558	0.00E+00	1.14E-19	6.26E-18	3.57E-17	9.35E-18	2.54E-18	1.32E-19	7.92E-25	2.50E-48	5.40E-17	4.08E-17
KR-88	0.7790	0.00E+00	2.50E-10	1.41E-08	1.02E-07	4.54E-08	2.47E-08	4.47E-09	2.46E-12	5.32E-27	1.90E-07	1.48E-07
KR-89	0.7842	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-131M	1.2055	0.00E+00	1.05E-06	6.03E-05	5.43E-04	3.88E-04	4.10E-04	2.80E-04	8.37E-06	1.01E-12	1.69E-03	2.04E-03
XE-133M	1.2614	0.00E+00	5.63E-06	3.23E-04	2.88E-03	2.02E-03	2.08E-03	1.33E-03	3.36E-05	1.96E-12	8.67E-03	1.09E-02
XE-133	1.0134	0.00E+00	4.12E-04	2.37E-02	2.13E-01	1.51E-01	1.58E-01	1.06E-01	3.01E-03	2.92E-10	6.54E-01	6.63E-01
XE-135M	0.7239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-135	0.3831	0.00E+00	1.34E-05	7.63E-04	6.42E-03	3.99E-03	3.44E-03	1.51E-03	1.37E-05	8.30E-15	1.62E-02	6.19E-03
XE-137	0.9364	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
XE-138	1.0007	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
											6.86E-01	6.87E-01
											2.19E-02	2.19E-02

Table VI-20

SOURCE TERM CORRECTION TO THYROID DOSE RESULTS

Bypass Portion (12% Iodines; 10% Noble Gases)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Corrected Dose (rem)
I-131 ELEM	1.1177	0.00E+00	1.04E-01	5.99E+00	9.85E+00	1.27E-02	8.93E-06	4.41E-12	2.62E-37	0.00E+00	1.60E+01	1.78E+01
I-132 ELEM	1.0544	0.00E+00	9.85E-13	5.53E-11	8.21E-11	6.18E-14	2.41E-17	3.68E-24	1.98E-51	0.00E+00	1.38E-10	1.46E-10
I-133 ELEM	0.9714	0.00E+00	5.03E-03	2.88E-01	4.69E-01	5.73E-04	3.80E-07	1.67E-13	6.16E-39	0.00E+00	7.63E-01	7.41E-01
I-134 ELEM	0.9201	0.00E+00	1.52E-28	8.18E-27	1.04E-26	3.15E-30	4.57E-34	9.63E-42	1.90E-72	0.00E+00	1.87E-26	1.72E-26
I-135 ELEM	1.0013	0.00E+00	6.20E-06	3.54E-04	5.62E-04	6.03E-07	3.48E-10	1.15E-16	1.40E-42	0.00E+00	9.22E-04	9.23E-04
I-131 ORG.	1.1177	0.00E+00	4.58E-03	2.63E-01	4.33E-01	5.58E-04	3.92E-07	1.94E-13	1.15E-38	0.00E+00	7.01E-01	7.84E-01
I-132 ORG.	1.0544	0.00E+00	4.33E-14	2.43E-12	3.61E-12	2.71E-15	1.06E-18	1.62E-25	8.71E-53	0.00E+00	6.08E-12	6.41E-12
I-133 ORG.	0.9714	0.00E+00	2.21E-04	1.27E-02	2.06E-02	2.52E-05	1.67E-08	7.32E-15	2.71E-40	0.00E+00	3.35E-02	3.26E-02
I-134 ORG.	0.9201	0.00E+00	6.67E-30	3.60E-28	4.55E-28	1.38E-31	2.01E-35	4.23E-43	8.35E-74	0.00E+00	8.22E-28	7.56E-28
I-135 ORG.	1.0013	0.00E+00	2.73E-07	1.55E-05	2.47E-05	2.65E-08	1.53E-11	5.07E-18	6.13E-44	0.00E+00	4.05E-05	4.06E-05
I-131 PART.	1.1177	0.00E+00	5.72E-03	3.29E-01	5.41E-01	6.98E-04	4.91E-07	2.42E-13	1.44E-38	0.00E+00	8.77E-01	9.80E-01
I-132 PART.	1.0544	0.00E+00	5.41E-14	3.04E-12	4.51E-12	3.39E-15	1.33E-18	2.02E-25	1.09E-52	0.00E+00	7.61E-12	8.02E-12
I-133 PART.	0.9714	0.00E+00	2.76E-04	1.58E-02	2.58E-02	3.15E-05	2.09E-08	9.15E-15	3.39E-40	0.00E+00	4.19E-02	4.07E-02
I-134 PART.	0.9201	0.00E+00	8.34E-30	4.50E-28	5.69E-28	1.73E-31	2.51E-35	5.29E-43	1.04E-73	0.00E+00	1.03E-27	9.45E-28
I-135 PART.	1.0013	0.00E+00	3.41E-07	1.94E-05	3.09E-05	3.32E-08	1.91E-11	6.34E-18	7.67E-44	0.00E+00	5.07E-05	5.07E-05
											Total	2.04E+01

	Corrected Dose (rem)	R.G. 1.109 to ICRP 30 DCF Corr.	Inventory Adjust	Total Corrected Dose (rem)
I-131 ELEM	1.78E+01	7.18E-01	8.24E-01	1.06E+01
I-132 ELEM	1.46E-10	4.40E-01	8.24E-01	5.29E-11
I-133 ELEM	7.41E-01	6.74E-01	8.24E-01	4.12E-01
I-134 ELEM	1.72E-26	2.88E-01	8.24E-01	4.08E-27
I-135 ELEM	9.23E-04	5.62E-01	8.24E-01	4.28E-04
I-131 ORG.	7.84E-01	7.18E-01	6.25E+00	3.52E+00
I-132 ORG.	6.41E-12	4.40E-01	6.25E+00	1.76E-11
I-133 ORG.	3.26E-02	6.74E-01	6.25E+00	1.37E-01
I-134 ORG.	7.56E-28	2.88E-01	6.25E+00	1.36E-27
I-135 ORG.	4.06E-05	5.62E-01	6.25E+00	1.43E-04
I-131 PART.	9.80E-01	7.18E-01	0.00E+00	0.00E+00
I-132 PART.	8.02E-12	4.40E-01	0.00E+00	0.00E+00
I-133 PART.	4.07E-02	6.74E-01	0.00E+00	0.00E+00
I-134 PART.	9.45E-28	2.88E-01	0.00E+00	0.00E+00
I-135 PART.	5.07E-05	5.62E-01	0.00E+00	0.00E+00
			Total:	1.46E+01

Table VI-21

SOURCE TERM CORRECTION TO BETA DOSE RESULTS

Bypass Portion (20% Kr-85)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
KR-85	1.0569	0.00E+00	3.32E-05	1.91E-03	1.73E-02	1.24E-02	1.32E-02	9.12E-03	2.84E-04	4.09E-11	5.42E-02	5.72E-02
											Total	5.72E-02

SUBJECT	MP-2 Fuel Handling Accident in the Spent Fuel Pool with 2% EBFS Bypass, Rev. 2	BY	JLW	DATE	8/4/98
		CHKED		DATE	
		CALC #	96RAD	1378R2	
		SHEET	31	OF	31

Table VI-22

SOURCE TERM CORRECTION TO WHOLE BODY DOSE RESULTS

Bypass Portion (20% Kr-85)

	Source Term Correction	0 - 72 hr	72 - 72.0028 hr	72.0028 - 72.167 hr	72.167 - 74 hrs	74 - 76 hrs	76 - 80 hrs	80 - 96 hrs	96 - 168 hrs	168 - 792 hrs	Integrated Dose rem	Total Corrected Dose (rem)
KR-85	1.0569	0.00E+00	4.30E-07	2.47E-05	2.23E-04	1.60E-04	1.70E-04	1.18E-04	3.67E-06	5.29E-13	7.01E-04	7.41E-04
											Total	7.41E-04

Calculation Review Comment and Resolution Form

(Sheet 1 of 2)

Calculation Number: 98RAD-1378R2 Revision: 2 Calculation Tiitle: MP-2 FUEL HANDLING ACCIDENT IN THE SPENT FUEL POOL WITH 2% EBFS BYPASS

Calc. Originator: James L. Wheeler Reviewer (PRINT): **Bill Eakin**

This form is intended to document significant comments and their resolutions. Typographical errors and other editorial recommendations may be marked up in the calculation text and presented to the originator

Review Type ☞ ☐ Interdiscipline ☒ Independent

Reviewer (SIGN) W Eakin Date: 8/18/98

(signature signifies all comments have been resolved to your satisfaction)

Item	Page/Section	Comments	Response
1	1/TITLE	PLACE RRESULTS IN EXECUTIVE SUMMARY	Done
2	7/TABLE IV-1	IN #3, CHNAGE REF 17 TO REF 16	Done
3	7/TABLE IV-1	IN # 9, CHANGE REF 18 TO REF 17	Done
4	7/TABLE IV-1	GIVE A BASIS FOR THE 2 HOUR RELEASE	Done
5	8/V	IN THE 3RD PARAGRAPH, CHANGE REF 17 TO REF 16	Done
6	11/TABLE VI-A	LIST A REFERENCE FOR THE 3RD COLUMN	Done
7	15, 16, 17/TABLES VI-6 TO 8	SOME OF THE X/Q'S DO NOT APPEAR IN THE ASSUMPTION	ADDED THE X/Q'S TO THE ASSUMPTIONS

Appendix A