MathCad Worksheet	TAC: MB7863,MB7864
S.F. LaVie, *NRR/DSSA/SPSB*	Catawba MOX for AST--Weir

INITIALIZATIONS

$Ci := 3.7 \cdot 10^{10} \cdot sec^{-1}$ $rem := 100 \cdot \frac{erg}{gm}$ $Bq := 1.0 \cdot sec^{-1}$ $MWt := 1.0 \cdot 10^{6} \cdot watt$

$ORIGIN := 1$ $uCi := 1.0 \cdot 10^{-6} \cdot Ci$ $mrem := 0.001 \cdot rem$ $Sv := 100 \cdot rem$

$kr85 := 3$ $I131 := 13$

$j := 1..12$ $i := 13..17$ $k := 1..17$

Read in nuclide database NUCLIDE.DAT.>>>>> $M := READPRN(nuclide)$

Re-assign arrays and assign units

$\lambda := M^{<2>} \cdot sec^{-1}$

INPUT DATA

Assembly Inventory from Staff ST report Table 7

	A_{MOX}	A_{LEU}
Kr83m	$4.2840 \cdot 10^{4}$	$6.5010 \cdot 10^{4}$
Kr85m	$7.8550 \cdot 10^{4}$	$1.3870 \cdot 10^{5}$
Kr85	$4.0430 \cdot 10^{3}$	$6.4860 \cdot 10^{3}$
Kr87	$1.4910 \cdot 10^{5}$	$2.8040 \cdot 10^{5}$
Kr88	$2.0010 \cdot 10^{5}$	$3.9230 \cdot 10^{5}$
Xe131m	$7.5110 \cdot 10^{3}$	$7.3460 \cdot 10^{3}$
Xe133m	$3.2540 \cdot 10^{4}$	$3.1380 \cdot 10^{4}$
Xe133	$9.8000 \cdot 10^{5}$	$9.9350 \cdot 10^{5}$
Xe135m	$2.3070 \cdot 10^{5}$	$2.1390 \cdot 10^{5}$
Xe135	$5.3860 \cdot 10^{5}$	$2.9230 \cdot 10^{5}$
Xe137	0.0	0.0
Xe138	$7.6430 \cdot 10^{5}$	$8.6920 \cdot 10^{5}$
I131	$5.1950 \cdot 10^{5}$	$4.8690 \cdot 10^{5}$
I132	$7.4150 \cdot 10^{5}$	$7.0520 \cdot 10^{5}$
I133	$9.7630 \cdot 10^{5}$	$9.9410 \cdot 10^{5}$
I134	$1.0420 \cdot 10^{6}$	$1.1140 \cdot 10^{6}$
I135	$9.2860 \cdot 10^{5}$	$9.4100 \cdot 10^{5}$

Radial peaking factor: $k_p := 1.65$

Decay Time $T_{decay} := 468 \cdot hr$

Assign gap fractions:

$F_{g_k} := 0.075$ noble gases and iodines

$F_{g_{I131}} := 0.12$

$F_{g_{kr85}} := 0.15$

Assign pool DF:

$DF_j := 1.0$

$DF_i := \frac{1}{200}$

We'll assume 4 of the 7 assemblies affected are MOX

$A_{core} := A_{MOX} \cdot 4 + A_{LEU} \cdot 3$

CALCULATION

Activity available for release:

$$A_{rel_k} := A_{core_k} \cdot k_p \cdot DF_k \cdot F_{g_k} \cdot e^{-\lambda_k \cdot T_{decay}}$$

$$A_{rel} = \begin{bmatrix} 0 \\ 0 \\ 8.788 \cdot 10^{3} \\ 0 \\ 0 \\ 2.07 \cdot 10^{3} \\ 57.614 \\ 6.49 \cdot 10^{4} \\ 0 \\ 1.189 \cdot 10^{-10} \\ 0 \\ 0 \\ 652.18 \\ 0 \\ 7.184 \cdot 10^{-4} \\ 0 \\ 0 \end{bmatrix} \cdot Ci$$

Kr83m
Kr85m
Kr85
Kr87
Kr88
Xe131m
Xe133m
Xe133
Xe135m
Xe135
Xe137
Xe138
I131
I132
I133
I134
I135

RG1.183 (RG1.25) stipulates that the activity is released over a two hour period. While it is typical to model an offsite release as a puff release of the total release inventory. However, for a control room assessment, the release must be expressed in terms of a rate. We'll assume that 99% is released in two hours.

$A_o := 1.0$

$A_f := 0.01$

$t := 2 \cdot hr$

$$A_f = A_o \cdot e^{-\lambda \cdot t}$$

solve for λ

$$\lambda := \frac{-\ln\left(\frac{A_f}{A_o}\right)}{t}$$

$$\lambda = 5.526 \cdot 10^{3} \cdot \frac{\%}{day}$$

RNEditor v1.0

File Name:
C:\Documents and Settings\Normal\My Documents\A_NRC\MOX\CatawbaMOX_WGD.RFT
C:\Documents and Settings\Normal\My Documents\A_NRC\MOX\CatawbaMOX_WGD.NIF

Description
Catawba Weir Gate w/4mox & 3LEU

RELEASE FRACTION

Duration, hr	1.0000E-04	0.0000E+00	0.0000E+00	0.0000E+00
Noble Gases:	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Iodine:	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cesium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Tellurium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Strontium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Barium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Ruthenium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Cerium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Lanthanium:	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Non-Radioactive Aerosols (kg):				
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

ACTIVITY, Ci (Stored in NIF File as Ci/MWt)

Co-58	0.0000E+00	Co-60	0.0000E+00	Kr-83m	0.0000E+00	Kr-85	8.7867E+03
Kr-85m	0.0000E+00	Kr-87	0.0000E+00	Kr-88	0.0000E+00	Rb-86	0.0000E+00
Sr-89	0.0000E+00	Sr-90	0.0000E+00	Sr-91	0.0000E+00	Sr-92	0.0000E+00
Y-90	0.0000E+00	Y-91	0.0000E+00	Y-92	0.0000E+00	Y-93	0.0000E+00
Zr-95	0.0000E+00	Zr-97	0.0000E+00	Nb-95	0.0000E+00	Mo-99	0.0000E+00
Tc-99m	0.0000E+00	Ru-103	0.0000E+00	Ru-105	0.0000E+00	Ru-106	0.0000E+00
Rh-105	0.0000E+00	Sb-127	0.0000E+00	Sb-129	0.0000E+00	Te-127	0.0000E+00
Te-127m	0.0000E+00	Te-129	0.0000E+00	Te-129m	0.0000E+00	Te-131m	0.0000E+00
Te-132	0.0000E+00	I-131	6.5218E+02	I-132	0.0000E+00	I-133	7.1836E-04
I-134	0.0000E+00	I-135	0.0000E+00	Xe-131m	2.0701E+03	Xe-133	6.4911E+04
Xe-133m	5.7612E+01	Xe-135	0.0000E+00	Xe-135m	0.0000E+00	Xe-138	0.0000E+00
Cs-134	0.0000E+00	Cs-136	0.0000E+00	Cs-137	0.0000E+00	Ba-139	0.0000E+00
Ba-140	0.0000E+00	La-140	0.0000E+00	La-141	0.0000E+00	La-142	0.0000E+00
Ce-141	0.0000E+00	Ce-143	0.0000E+00	Ce-144	0.0000E+00	Pr-143	0.0000E+00
Nd-147	0.0000E+00	Np-239	0.0000E+00	Pu-241	0.0000E+00	Cm-242	0.0000E+00

```
 ##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on 12/27/2003  at  0:16:59
 ##########################################################################

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

 Plant file           = C:\Documents and Settings\Normal\My
Documents\A_NRC\MOX\catawbawgd_mOX.psf
 Inventory file       = C:\Documents and Settings\Normal\My
Documents\A_NRC\MOX\CatawbaMOX_WGD.NIF
 Release file         = C:\Documents and Settings\Normal\My
Documents\A_NRC\MOX\CatawbaMOX_WGD.RFT
 Dose Conversion file = c:\program files\radtrad3.03\defaults\dba_fg11&12.inp
```

WEIR GATE CASE

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

```
 Radtrad 3.03 4/15/2001

 Nuclide Inventory File:
 C:\Documents and Settings\Normal\My Documents\A_NRC\MOX\CatawbaMOX_WGD.NIF
 Plant Power Level:
  3.4110E+03
 Compartments:
   3
 Compartment 1:
 FHB/CNMT
   3
  1.0000E+00
   0
   0
   0
   0
   0
 Compartment 2:
 Environm
   2
  0.0000E+00
   0
   0
   0
   0
   0
 Compartment 3:
 Control Room
   1
  1.1790E+05
   0
```

```
  0
  1
  0
  0
Pathways:
  4
Pathway 1:
FHB/CNMT to Environm
  1
  2
  4
Pathway 2:
Environm to Control Room-unfilt
  2
  3
  2
Pathway 3:
Environm to Control Room Filt
  2
  3
  2
Pathway 4:
Control Room to Environm
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\dba_fg11&12.inp
C:\Documents and Settings\Normal\My Documents\A_NRC\MOX\CatawbaMOX_WGD.RFT
  0.0000E+00
  0
  0.0000E+00   5.7000E-01   4.3000E-01   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 2:
  0
  1
```

```
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  1
  1.5000E+03
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  5.0000E-01   9.9000E+01   9.9000E+01   9.5000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Pathways:
  4
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   5.5260E+03
  2.0000E+00   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.1000E+03   0.0000E+00   0.0000E+00   0.0000E+00
  5.0000E-01   1.0000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  0
  0
  0
```

```
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  5.0000E-01   2.0000E+03   9.9000E+01   9.9000E+01   9.5000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.1000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  5.0000E-01   2.1000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  2
  1
  2
  0.0000E+00   4.7800E-04
  2.0000E+00   0.0000E+00
  1
  4
  0.0000E+00   3.4700E-04
  8.0000E+00   1.7500E-04
  2.4000E+01   2.3200E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  2
  1
  2
  0.0000E+00   6.8500E-05
  2.0000E+00   0.0000E+00
  1
  4
  0.0000E+00   3.4700E-04
  8.0000E+00   1.7500E-04
  2.4000E+01   2.3200E-04
  7.2000E+02   0.0000E+00
  0
Location 3:
```

```
Control Room
  3
  0
  1
  2
  0.0000E+00   3.4700E-04
  7.2000E+02   0.0000E+00
  1
  4
  0.0000E+00   1.0000E+00
  2.4000E+01   6.0000E-01
  9.6000E+01   4.0000E-01
  7.2000E+02   0.0000E+00
Effective Volume Location:
  1
  2
  0.0000E+00   1.0400E-03
  2.0000E+00   0.0000E+00
Simulation Parameters:
  1
  0.0000E+00   0.0000E+00
Output Filename:
C:\Documents and Settings\Normal\My Documents\A_NRC\MOX\catawbawgd_mOX.o0
  1
  1
  1
  0
  0
End of Scenario File


########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/27/2003  at  0:16:59
########################################################################

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

Number of Nuclides =  60

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   3.4110E+03 MWth

Number of compartments    =   3

Compartment information

Compartment number  1  (Source term fraction =   1.0000E+00
)
Name: FHB/CNMT
Compartment volume =   1.0000E+00 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: FHB/CNMT to Environm

Compartment number  2
Name: Environm
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: FHB/CNMT to Environm
```

```
   Inlet Pathway Number   4: Control Room to Environm
   Exit Pathway Number    2: Environm to Control Room-unfilt
   Exit Pathway Number    3: Environm to Control Room Filt

Compartment number  3
Name: Control Room
Compartment volume =   1.1790E+05 (Cubic feet)
Compartment type is Control Room
Removal devices within compartment:
     Filter(s)
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environm to Control Room-unfilt
   Inlet Pathway Number   3: Environm to Control Room Filt
   Exit Pathway Number    4: Control Room to Environm

Total number of pathways =   4

##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/27/2003  at  0:16:59
##########################################################################

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

Radioactive Decay is enabled

Release Fractions and Timings
                GAP       EARLY IN-VESSEL  LATE RELEASE    RELEASE MASS
             0.000100 hr    0.0000 hrs      0.0000 hrs          (gm)
NOBLES       1.0000E+00     0.0000E+00      0.0000E+00        2.274E+01
IODINE       1.0000E+00     0.0000E+00      0.0000E+00        5.261E-03
CESIUM       0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
TELLURIUM    0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
STRONTIUM    0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
BARIUM       0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
RUTHENIUM    0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
CERIUM       0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00
LANTHANUM    0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00

Inventory Power =      3411. MWt

Nuclide  Group  Specific     half     Whole Body   Inhaled     Inhaled
 Name          Inventory     life        DCF       Thyroid    Effective
                (Ci/MWt)     (s)     (Sv-m3/Bq-s)  (Sv/Bq)     (Sv/Bq)
 Kr-85     1   2.576E+00  3.383E+08   1.190E-16   0.000E+00   0.000E+00
 I-131     2   1.912E-01  6.947E+05   1.820E-14   2.920E-07   8.890E-09
 I-133     2   2.106E-07  7.488E+04   2.940E-14   4.860E-08   1.580E-09
 Xe-131m   1   6.069E-01  1.023E+06   7.890E-16   0.000E+00   0.000E+00
 Xe-133    1   1.903E+01  4.532E+05   1.560E-15   0.000E+00   0.000E+00
 Xe-133m   1   1.689E-02  1.892E+05   2.160E-15   0.000E+00   0.000E+00

Iodine fractions
     Aerosol     =   0.0000E+00
     Elemental   =   5.7000E-01
     Organic     =   4.3000E-01

COMPARTMENT DATA

Compartment number   1: FHB/CNMT
```

Compartment number 2: Environm

Compartment number 3: Control Room

Compartment Filter Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.5000E+03	0.0000E+00	0.0000E+00	0.0000E+00
5.0000E-01	1.5000E+03	9.9000E+01	9.9000E+01	9.5000E+01
7.2000E+02	1.5000E+03	0.0000E+00	0.0000E+00	0.0000E+00

PATHWAY DATA

Pathway number 1: FHB/CNMT to Environm

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	5.5260E+03
2.0000E+00	0.0000E+00

Pathway number 2: Environm to Control Room-unfilt

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.1000E+03	0.0000E+00	0.0000E+00	0.0000E+00
5.0000E-01	1.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 3: Environm to Control Room Filt

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
5.0000E-01	2.0000E+03	9.9000E+01	9.9000E+01	9.5000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 4: Control Room to Environm

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.1000E+03	1.0000E+02	1.0000E+02	1.0000E+02
5.0000E-01	2.1000E+03	1.0000E+02	1.0000E+02	1.0000E+02
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

LOCATION DATA

Location EAB is in compartment 2

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	4.7800E-04
2.0000E+00	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)

```
  0.0000E+00                3.4700E-04
  8.0000E+00                1.7500E-04
  2.4000E+01                2.3200E-04
  7.2000E+02                0.0000E+00
Location LPZ     is in compartment   2

Location X/Q Data
 Time (hr)         X/Q (s * m^-3)
  0.0000E+00          6.8500E-05
  2.0000E+00          0.0000E+00

Location Breathing Rate Data
 Time (hr)         Breathing Rate (m^3 * sec^-1)
  0.0000E+00                3.4700E-04
  8.0000E+00                1.7500E-04
  2.4000E+01                2.3200E-04
  7.2000E+02                0.0000E+00
Location Control Room     is in compartment   3

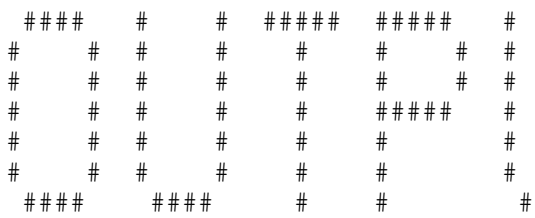
Location X/Q Data
 Time (hr)         X/Q (s * m^-3)
  0.0000E+00          1.0400E-03
  2.0000E+00          0.0000E+00

Location Breathing Rate Data
 Time (hr)         Breathing Rate (m^3 * sec^-1)
  0.0000E+00                3.4700E-04
  7.2000E+02                0.0000E+00

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

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
     Time            Time step
      0.0000E+00       0.0000E+00
```

```
########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/27/2003  at  0:16:59
########################################################################
```



```
########################################################################
                                Dose Output
########################################################################

EAB Doses:

Time (h) =   0.0001    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.3604E-05  1.3454E-02  4.3321E-04
Accumulated dose (rem)  2.3604E-05  1.3454E-02  4.3321E-04

LPZ Doses:

Time (h) =   0.0001    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.3825E-06  1.9280E-03  6.2081E-05
Accumulated dose (rem)  3.3825E-06  1.9280E-03  6.2081E-05

Control Room Doses:

Time (h) =   0.0001    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.2113E-10  1.5641E-06  4.7740E-08
Accumulated dose (rem)  1.2113E-10  1.5641E-06  4.7740E-08

EAB Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.4005E-01  7.9850E+01  2.5711E+00
Accumulated dose (rem)  1.4008E-01  7.9864E+01  2.5715E+00

LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0071E-02  1.1443E+01  3.6845E-01
Accumulated dose (rem)  2.0074E-02  1.1445E+01  3.6852E-01

Control Room Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.5074E-03  4.5308E+01  1.3829E+00
Accumulated dose (rem)  3.5074E-03  4.5308E+01  1.3829E+00

EAB Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
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Delta dose (rem)	6.2525E-02	3.5688E+01	1.1490E+00
Accumulated dose (rem)	2.0260E-01	1.1555E+02	3.7206E+00

LPZ Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.9602E-03	5.1142E+00	1.6466E-01
Accumulated dose (rem)	2.9034E-02	1.6559E+01	5.3318E-01

Control Room Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1265E-02	7.3312E+01	2.2433E+00
Accumulated dose (rem)	1.4772E-02	1.1862E+02	3.6262E+00

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.0260E-01	1.1555E+02	3.7206E+00

LPZ Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.9034E-02	1.6559E+01	5.3318E-01

Control Room Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.5479E-03	5.5258E+00	1.7178E-01
Accumulated dose (rem)	1.8320E-02	1.2415E+02	3.7980E+00

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.0260E-01	1.1555E+02	3.7206E+00

LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.9034E-02	1.6559E+01	5.3318E-01

Control Room Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.5884E-06	1.0406E-04	8.7566E-06
Accumulated dose (rem)	1.8326E-02	1.2415E+02	3.7980E+00

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.0260E-01	1.1555E+02	3.7206E+00

LPZ Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

Accumulated dose (rem)	2.9034E-02	1.6559E+01	5.3318E-01

Control Room Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.5373E-13	5.8931E-17	2.5373E-13
Accumulated dose (rem)	1.8326E-02	1.2415E+02	3.7980E+00

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.0260E-01	1.1555E+02	3.7206E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.9034E-02	1.6559E+01	5.3318E-01

Control Room Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.3918E-47	1.6120E-73	4.3918E-47
Accumulated dose (rem)	1.8326E-02	1.2415E+02	3.7980E+00

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I-131 Summary

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Time (hr)	FHB/CNMT I-131 (Curies)	Environm I-131 (Curies)	Control Room I-131 (Curies)
0.000	6.5211E+02	7.5077E-02	7.7381E-05
0.401	2.5891E+02	3.9258E+02	3.1839E-01
0.500	2.0590E+02	4.4550E+02	3.3786E-01
0.800	1.0309E+02	5.4814E+02	2.0183E-01
1.100	5.1611E+01	5.9952E+02	1.2001E-01
1.400	2.5840E+01	6.2525E+02	7.1091E-02
1.700	1.2937E+01	6.3813E+02	4.1980E-02
2.000	6.4770E+00	6.4458E+02	2.4725E-02
2.300	6.4700E+00	6.4458E+02	1.4347E-02
2.600	6.4631E+00	6.4458E+02	8.3258E-03
2.900	6.4561E+00	6.4458E+02	4.8315E-03
3.200	6.4491E+00	6.4458E+02	2.8038E-03
3.500	6.4422E+00	6.4458E+02	1.6271E-03
3.800	6.4353E+00	6.4458E+02	9.4430E-04
4.100	6.4283E+00	6.4458E+02	5.4803E-04
4.400	6.4214E+00	6.4458E+02	3.1806E-04
4.700	6.4145E+00	6.4458E+02	1.8459E-04
5.000	6.4076E+00	6.4458E+02	1.0714E-04
5.300	6.4007E+00	6.4458E+02	6.2183E-05
5.600	6.3938E+00	6.4458E+02	3.6092E-05
5.900	6.3869E+00	6.4458E+02	2.0949E-05
6.200	6.3800E+00	6.4458E+02	1.2160E-05
6.500	6.3731E+00	6.4458E+02	7.0580E-06
6.800	6.3663E+00	6.4458E+02	4.0969E-06
7.100	6.3594E+00	6.4458E+02	2.3782E-06
7.400	6.3526E+00	6.4458E+02	1.3805E-06
7.700	6.3457E+00	6.4458E+02	8.0139E-07

8.000	6.3389E+00	6.4458E+02	4.6522E-07
8.300	6.3321E+00	6.4458E+02	2.7007E-07
8.600	6.3253E+00	6.4458E+02	1.5679E-07
8.900	6.3184E+00	6.4458E+02	9.1022E-08
9.200	6.3116E+00	6.4458E+02	5.2844E-08
9.500	6.3048E+00	6.4458E+02	3.0680E-08
9.800	6.2980E+00	6.4458E+02	1.7812E-08
10.100	6.2913E+00	6.4458E+02	1.0342E-08
10.400	6.2845E+00	6.4458E+02	6.0046E-09
24.000	5.9849E+00	6.4458E+02	1.2130E-19
96.000	4.6210E+00	6.4458E+02	4.9770E-76
720.000	4.9127E-01	6.4458E+02	0.0000E+00

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Cumulative Dose Summary

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	EAB		LPZ		Control Room	
Time (hr)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.401	7.0377E+01	2.2661E+00	1.0085E+01	3.2474E-01	3.2128E+01	9.8064E-01
0.500	7.9864E+01	2.5715E+00	1.1445E+01	3.6852E-01	4.5308E+01	1.3829E+00
0.800	9.8263E+01	3.1640E+00	1.4082E+01	4.5341E-01	7.7425E+01	2.3639E+00
1.100	1.0747E+02	3.4605E+00	1.5402E+01	4.9591E-01	9.6570E+01	2.9495E+00
1.400	1.1209E+02	3.6090E+00	1.6063E+01	5.1719E-01	1.0793E+02	3.2978E+00
1.700	1.1440E+02	3.6834E+00	1.6393E+01	5.2785E-01	1.1466E+02	3.5042E+00
2.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.1862E+02	3.6262E+00
2.300	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2094E+02	3.6978E+00
2.600	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2229E+02	3.7395E+00
2.900	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2307E+02	3.7638E+00
3.200	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2352E+02	3.7779E+00
3.500	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2378E+02	3.7862E+00
3.800	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2394E+02	3.7911E+00
4.100	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2402E+02	3.7939E+00
4.400	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2408E+02	3.7956E+00
4.700	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2411E+02	3.7965E+00
5.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2412E+02	3.7971E+00
5.300	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2413E+02	3.7975E+00
5.600	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2414E+02	3.7977E+00
5.900	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2414E+02	3.7978E+00
6.200	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2414E+02	3.7979E+00
6.500	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7979E+00
6.800	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
7.100	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
7.400	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
7.700	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
8.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
8.300	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
8.600	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
8.900	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
9.200	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
9.500	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
9.800	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
10.100	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
10.400	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
24.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
96.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00
720.000	1.1555E+02	3.7206E+00	1.6559E+01	5.3318E-01	1.2415E+02	3.7980E+00

##

Worst Two-Hour Doses

##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.0	2.0260E-01	1.1555E+02	3.7206E+00

Licensee results: 3.5 at EAB, 0.5 at LPZ, 3.798 in CR