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Interactive Rapid Dose Assessment Model (IRDAM)

Scenarios for Comparing Dose Assessment Models

Prepared by R. W. Poeton, M. P. Moeller, G. J. Laughlin, A. E. Desrosiers

Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

Prepared for
U.S. Nuclear Regulatory
Commission

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ABSTRACT

The Interactive Rapid Dose Assessment Model (IRDAM) is a micro-computer based program designed to provide rapid assessments of the radiological impact of accidents at nuclear power plants. The main body of this document consists of 28 examples of IRDAM input and output representing various types of accidents and releases. These examples are intended to provide a basis for comparison with other models or for testing IRDAM itself. Figures are included which show dose rates calculated by IRDAM for each scenario. Figures are also included which show calculations made using the computer codes WRAITH (Scherpelz, Borst and Hoenes, 1980) and RADPUR (Dabbert, et. al., 1982).

Two other companion volumes to this one provide additional information on IRDAM. The User's Guide (NUREG/CR-3012, Volume 1) describes the setup and operation of equipment necessary to run IRDAM. Reactor Accident Assessment Methods (NUREG/CR-3012, Volume 2) describes the technical bases for IRDAM including methods, models and assumptions used in calculations

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INTRODUCTION

The Interactive Rapid Dose Assessment Model (IRDAM) is a micro-computer based program designed to provide rapid assessments of the radiological impact of accidents at nuclear power plants without significant training. One of the purposes of this model is to make available a uniform basis for comparison with other models that is consistent at all locations. Results obtained using other methods should be compared with IRDAM results not from the standpoint that IRDAM is the correct method, but with the intent of understanding what differences exist between models and how those differences will impact projected doses. Information on the methods and assumptions used in IRDAM can be found in Volume 2 of this document (Reactor Accident Assessment Methods).

This document includes the printouts from IRDAM runs based on 28 different accident scenarios. Both input and output summaries are included. These results can be used to verify the proper functioning of the program and as a basis for comparison with other methods and models. Graphs of the IRDAM results, in addition to results obtained using the computer codes WRAITH (Scherpelz, Borst and Hoenes, 1980) and RADPUR (Dabbert, et. al., 1982) have been provided for easy reference and comparison.

Table 1 lists the example scenarios. All release rates are normalized to 1 Ci/s. Decay times indicated represent either the time between measurement and release (for single radionuclides) or time between shutdown and release (for gross releases).

The noble gas scenarios (1-4) use different combinations of atmospheric conditions and intervals between shutdown and release for gross ground level releases. The iodine scenarios (5-16) show the effects of various release heights, atmospheric conditions and intervals between reactor shutdown and release. The scenarios for individual radionuclides (17-28) show results for combinations of release heights and atmospheric conditions for different photon energies (i.e., ^{133}Xe , ^{137}Cs , and ^{88}Kr).

The 28 scenarios show input information and calculated results obtained using IRDAM. The whole body dose rates represent photon doses from the passing cloud, while thyroid dose rates presented are 50-year dose commitment values normalized to 1 hour of inhalation. Integrated doses shown in each scenario summary are obtained by multiplying the calculated dose rates by the total duration of the release. Note that in the case of the iodine scenarios, where there are no noble gases present, the iodine-to-noble gas ratio approaches infinity. In this circumstance the program prints out a very large ratio (1.70E + 38) as input information.

TABLE 1. Example scenarios

Scenario No.	Release Type	Release Height (m)	Stability Class	Windspeed (mph)	Decay Time (hr)
1	gross (100% Noble Gas)	0	B	10	32
2	gross (100% Noble Gas)	0	B	10	2
3	gross (100% Noble Gas)	0	F	1	2
4	gross (100% Noble Gas)	0	F	1	32
5	gross (100% Iodine)	0	B	10	2
6	gross (100% Iodine)	0	F	1	2
7	gross (100% Iodine)	0	F	10	32
8	gross (100% Iodine)	0	B	1	32
9	gross (100% Iodine)	60	B	10	2
10	gross (100% Iodine)	60	B	10	32
11	gross (100% Iodine)	60	F	1	32
12	gross (100% Iodine)	60	F	1	2
13	gross (100% Iodine)	100	F	1	32
14	gross (100% Iodine)	100	F	1	2
15	gross (100% Iodine)	100	B	10	32
16	gross (100% Iodine)	100	B	10	2
17	^{133}Xe	100	F	1	0
18	^{133}Xe	100	B	10	0
19	^{133}Xe	60	F	1	0

TABLE 1 (contd)

Scenario No.	Release Type	Release Height (m)	Stability Class	Windspeed (mph)	Decay Time (hr)
20	^{133}Xe	60	B	10	0
21	^{137}Cs	100	F	1	0
22	^{137}Cs	100	B	10	0
23	^{137}Cs	60	F	1	0
24	^{137}Cs	60	B	10	0
25	^{88}Kr	100	F	1	0
26	^{88}Kr	100	B	10	0
27	^{88}Kr	60	F	1	0
28	^{88}Kr	60	B	10	0

IRDAM SCENARIO 1
GROSS NOBLE GAS

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0815 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 4.47

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 0.00

PERCENTAGE NOBLE GAS: 100.00

IODINE TO NOBLE GAS RATIO: 0.00E+00

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 100.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE		PLUME TRAVEL TIME	CHI/Q
(METERS)	(MILES)	(HOURS:MINUTES)	VALUE
500.0	0.3	0 : 1.9	1.64E-05
1000.0	0.6	0 : 3.7	3.56E-06
2000.0	1.2	0 : 7.5	6.26E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	5.51E-04	0.00E+00
1000.0	0.6	1.19E-04	0.00E+00
2000.0	1.2	2.10E-05	0.00E+00
3000.0	1.9	6.71E-06	0.00E+00
8000.0	5.0	1.25E-06	0.00E+00
20000.0	12.4	5.58E-07	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.41E-03	0.00E+00
1000.0	0.6	9.54E-04	0.00E+00
2000.0	1.2	1.68E-04	0.00E+00
3000.0	1.9	5.37E-05	0.00E+00
8000.0	5.0	9.96E-06	0.00E+00
20000.0	12.4	4.47E-06	0.00E+00

IRDAM SCENARIO 2
GROSS NOBLE GAS

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0810 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 4.47

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 0.00

PERCENTAGE NOBLE GAS: 100.00

IODINE TO NOBLE GAS RATIO: 0.00E+00

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 100.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE		PLUME TRAVEL TIME	CHI/O
(METERS)	(MILES)	(HOURS:MINUTES)	VALUE
500.0	0.3	0 : 1.9	1.64E-05
1000.0	0.6	0 : 3.7	3.56E-06
2000.0	1.2	0 : 7.5	6.26E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.97E-03	0.00E+00
1000.0	0.6	1.07E-03	0.00E+00
2000.0	1.2	1.89E-04	0.00E+00
3000.0	1.9	6.04E-05	0.00E+00
8000.0	5.0	1.12E-05	0.00E+00
20000.0	12.4	5.03E-06	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.97E-02	0.00E+00
1000.0	0.6	8.59E-03	0.00E+00
2000.0	1.2	1.51E-03	0.00E+00
3000.0	1.9	4.83E-04	0.00E+00
8000.0	5.0	8.97E-05	0.00E+00
20000.0	12.4	4.02E-05	0.00E+00

IR DAM SCENARIO 3
GROSS NOBLE GAS

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0805 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 0.45

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 0.00

PERCENTAGE NOBLE GAS: 100.00

IODINE TO NOBLE GAS RATIO: 0.00E+00

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 100.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 6.00

AGE OF RELEASED MATERIAL: < 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE (METERS)	(MILES)	PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	5.06E-03
1000.0	0.6	0 : 37.3	1.47E-03
2000.0	1.2	1 : 14.6	5.01E-04
3000.0	1.9	1 : 51.8	2.71E-04
8000.0	5.0	4 : 58.3	7.09E-05
20000.0	12.4	12 : 25.6	2.07E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.53E+00	0.00E+00
1000.0	0.6	4.43E-01	0.00E+00
2000.0	1.2	1.51E-01	0.00E+00
3000.0	1.9	8.18E-02	0.00E+00
8000.0	5.0	2.14E-02	0.00E+00
20000.0	12.4	6.26E-03	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.22E+01	0.00E+00
1000.0	0.6	3.54E+00	0.00E+00
2000.0	1.2	1.21E+00	0.00E+00
3000.0	1.9	6.54E-01	0.00E+00
8000.0	5.0	1.71E-01	0.00E+00
20000.0	12.4	5.01E-02	0.00E+00

IRIAM SCENARIO 4
GROSS NOBLE GAS

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0755 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE (11

GROUND LEVEL WIND SPEED (M/SEC): 0.45

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 0.00

PERCENTAGE NOBLE GAS: 100.00

IODINE TO NOBLE GAS RATIO: 0.00E+00

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 100.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	5.06E-03
1000.0	0.6	0 : 37.3	1.47E-03
2000.0	1.2	1 : 14.6	5.01E-04
3000.0	1.9	1 : 51.8	2.71E-04
8000.0	5.0	4 : 58.3	7.09E-05
20000.0	12.4	12 : 25.6	2.07E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.70E-01	0.00E+00
1000.0	0.6	4.91E-02	0.00E+00
2000.0	1.2	1.68E-02	0.00E+00
3000.0	1.9	9.08E-03	0.00E+00
8000.0	5.0	2.38E-03	0.00E+00
20000.0	12.4	6.95E-04	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.36E+00	0.00E+00
1000.0	0.6	3.93E-01	0.00E+00
2000.0	1.2	1.34E-01	0.00E+00
3000.0	1.9	7.26E-02	0.00E+00
8000.0	5.0	1.90E-02	0.00E+00
20000.0	12.4	5.56E-03	0.00E+00

IRDAM SCENARIO 5
GROSS IODINE (H=0)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1530 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 4.47

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	1.64E-05
1000.0	0.6	0 : 3.7	3.56E-06
2000.0	1.2	0 : 7.5	6.26E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.97E-03	1.62E+01
1000.0	0.6	1.07E-03	3.51E+00
2000.0	1.2	1.89E-04	6.18E-01
3000.0	1.9	6.04E-05	1.97E-01
8000.0	5.0	1.12E-05	3.66E-02
20000.0	12.4	5.03E-06	1.64E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.97E-02	1.30E+02
1000.0	0.6	8.59E-03	2.81E+01
2000.0	1.2	1.51E-03	4.94E+00
3000.0	1.9	4.83E-04	1.58E+00
8000.0	5.0	8.97E-05	2.93E-01
20000.0	12.4	4.02E-05	1.31E-01

IRDAM SCENARIO 6
GROSS IODINE (H=0)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1555 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 0.45

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE		PLUME TRAVEL TIME	CHI/Q
(METERS)	(MILES)	(HOURS:MINUTES)	VALUE
500.0	0.3	0 : 18.6	5.06E-03
1000.0	0.6	0 : 37.3	1.47E-03
2000.0	1.2	1 : 14.6	5.01E-04
3000.0	1.9	1 : 51.8	2.71E-04
8000.0	5.0	4 : 58.3	7.09E-05
20000.0	12.4	12 : 25.6	2.07E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.53E+00	4.99E+03
1000.0	0.6	4.43E-01	1.45E+03
2000.0	1.2	1.51E-01	4.94E+02
3000.0	1.9	8.18E-02	2.67E+02
8000.0	5.0	2.14E-02	7.00E+01
20000.0	12.4	6.26E-03	2.05E+01

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.22E+01	3.99E+04
1000.0	0.6	3.54E+00	1.16E+04
2000.0	1.2	1.21E+00	3.96E+03
3000.0	1.9	6.54E-01	2.14E+03
8000.0	5.0	1.71E-01	5.60E+02
20000.0	12.4	5.01E-02	1.64E+02

IRDAM SCENARIO 7
GROSS IODINE (H=0)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1550 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 0.45

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE		PLUME TRAVEL TIME	CHI/Q
(METERS)	(MILES)	(HOURS:MINUTES)	VALUE
500.0	0.3	0 : 18.6	5.06E-03
1000.0	0.6	0 : 37.3	1.47E-03
2000.0	1.2	1 : 14.6	5.01E-04
3000.0	1.9	1 : 51.8	2.71E-04
8000.0	5.0	4 : 58.3	7.09E-05
20000.0	12.4	12 : 25.6	2.07E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.70E-01	1.34E+04
1000.0	0.6	4.91E-02	3.88E+03
2000.0	1.2	1.68E-02	1.33E+03
3000.0	1.9	9.08E-03	7.17E+02
8000.0	5.0	2.38E-03	1.88E+02
20000.0	12.4	6.95E-04	5.50E+01

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.36E+00	1.07E+05
1000.0	0.6	3.93E-01	3.11E+04
2000.0	1.2	1.34E-01	1.06E+04
3000.0	1.9	7.26E-02	5.74E+03
8000.0	5.0	1.90E-02	1.50E+03
20000.0	12.4	5.56E-03	4.40E+02

IRDAM SCENARIO 8
GROSS IODINE (H=0)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1545 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

GROUND LEVEL WIND SPEED (M/SEC): 4.47

GROUND LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

 ***** PLUME INFORMATION *****

DISTANCE		PLUME TRAVEL TIME	CHI/Q
(METERS)	(MILES)	(HOURS:MINUTES)	VALUE
500.0	0.3	0 : 1.9	1.64E-05
1000.0	0.6	0 : 3.7	3.56E-06
2000.0	1.2	0 : 7.5	6.26E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	5.51E-04	4.36E+01
1000.0	0.6	1.19E-04	9.43E+00
2000.0	1.2	2.10E-05	1.66E+00
3000.0	1.9	6.71E-06	5.30E-01
8000.0	5.0	1.25E-06	9.84E-02
20000.0	12.4	5.58E-07	4.41E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.41E-03	3.49E+02
1000.0	0.6	9.54E-04	7.54E+01
2000.0	1.2	1.68E-04	1.33E+01
3000.0	1.9	5.37E-05	4.24E+00
8000.0	5.0	9.96E-06	7.87E-01
20000.0	12.4	4.47E-06	3.53E-01

IRDAM SCENARIO 9
GROSS IODINE (H=60 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1655 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS.
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	9.45E-06
1000.0	0.6	0 : 3.7	3.22E-06
2000.0	1.2	0 : 7.5	6.20E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.85E-03	9.32E+00
1000.0	0.6	9.73E-04	3.18E+00
2000.0	1.2	1.87E-04	6.11E-01
3000.0	1.9	6.03E-05	1.97E-01
8000.0	5.0	1.12E-05	3.66E-02
20000.0	12.4	5.02E-06	1.64E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.28E-02	7.46E+01
1000.0	0.6	7.79E-03	2.54E+01
2000.0	1.2	1.50E-03	4.89E+00
3000.0	1.9	4.82E-04	1.58E+00
8000.0	5.0	8.97E-05	2.93E-01
20000.0	12.4	4.02E-05	1.31E-01

IRDAM SCENARIO 10
GROSS IODINE (H=60 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1650 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND    500.0 METERS. *
* SEE SUMMARY OUTPUT LISTED BELOW.     *
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*****
***** PLUME INFORMATION *****
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DISTANCE (METERS)	(MILES)	PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	9.45E-06
1000.0	0.6	0 : 3.7	3.22E-06
2000.0	1.2	0 : 7.5	6.20E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.17E-04	2.50E+01
1000.0	0.6	1.08E-04	9.54E+00
2000.0	1.2	2.08E-05	1.64E+00
3000.0	1.9	6.69E-06	5.29E-01
8000.0	5.0	1.24E-06	9.84E-02
20000.0	12.4	5.58E-07	4.41E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.53E-03	2.00E+02
1000.0	0.6	8.65E-04	6.83E+01
2000.0	1.2	1.66E-04	1.31E+01
3000.0	1.9	5.35E-05	4.23E+00
8000.0	5.0	9.96E-06	7.87E-01
20000.0	12.4	4.46E-06	3.53E-01

IRDAM SCENARIO 11
GROSS IODINE (H=60 m)

 ***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1640 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
 TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
 OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 3000.0 AND 8000.0 METERS.    *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/O VALUE
500.0	0.3	0 : 18.6	1.48E-16
1000.0	0.6	0 : 37.3	7.53E-08
2000.0	1.2	1 : 14.6	9.66E-06
3000.0	1.9	1 : 51.8	2.50E-05
8000.0	5.0	4 : 58.3	2.68E-05
20000.0	12.4	12 : 25.6	1.25E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.42E-02	3.92E-10
1000.0	0.6	1.89E-02	1.99E-01
2000.0	1.2	1.82E-02	2.56E+01
3000.0	1.9	1.76E-02	6.64E+01
8000.0	5.0	8.98E-04	7.10E+01
20000.0	12.4	4.18E-04	3.30E+01

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.94E-01	3.13E-09
1000.0	0.6	1.51E-01	1.60E+00
2000.0	1.2	1.46E-01	2.05E+02
3000.0	1.9	1.41E-01	5.31E+02
8000.0	5.0	7.19E-03	5.68E+02
20000.0	12.4	3.35E-03	2.64E+02

IRDAM SCENARIO 12
GROSS IODINE (H=60 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1600 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 3000.0 AND 8000.0 METERS.    *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	1.48E-16
1000.0	0.6	0 : 37.3	7.53E-08
2000.0	1.2	1 : 14.6	9.66E-06
3000.0	1.9	1 : 51.8	2.50E-05
8000.0	5.0	4 : 58.3	2.68E-05
20000.0	12.4	12 : 25.6	1.25E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.46E-02	1.46E-10
1000.0	0.6	3.17E-02	7.43E-02
2000.0	1.2	2.69E-02	9.53E+00
3000.0	1.9	2.31E-02	2.47E+01
8000.0	5.0	8.09E-03	2.64E+01
20000.0	12.4	3.77E-03	1.23E+01

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.57E-01	1.17E-09
1000.0	0.6	2.53E-01	5.94E-01
2000.0	1.2	2.15E-01	7.62E+01
3000.0	1.9	1.85E-01	1.98E+02
8000.0	5.0	6.47E-02	2.11E+02
20000.0	12.4	3.01E-02	9.85E+01

IRDAM SCENARIO 13
GROSS IODINE (H=100 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0745 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE 111

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 8000.0 AND 20000.0 METERS.   *
* SEE SUMMARY OUTPUT LISTED BELOW.     *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS;MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	0.00E+00
1000.0	0.6	0 : 37.3	1.78E-15
2000.0	1.2	1 : 14.6	8.63E-09
3000.0	1.9	1 : 51.8	3.64E-07
8000.0	5.0	4 : 58.3	4.75E-06
20000.0	12.4	12 : 25.6	5.05E-06

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.31E-02	0.00E+00
1000.0	0.6	1.23E-02	4.72E-09
2000.0	1.2	1.14E-02	2.29E-02
3000.0	1.9	1.11E-02	9.65E-01
8000.0	5.0	1.24E-02	1.26E+01
20000.0	12.4	1.69E-04	1.34E+01

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.05E-01	0.00E+00
1000.0	0.6	9.81E-02	3.78E-08
2000.0	1.2	9.10E-02	1.83E-01
3000.0	1.9	8.87E-02	7.72E+00
8000.0	5.0	9.93E-02	1.01E+02
20000.0	12.4	1.36E-03	1.07E+02

IRDAM SCENARIO 14
GROSS IODINE (H=100 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0735 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN          *
* BETWEEN 8000.0 AND 20000.0 METERS.        *
* SEE SUMMARY OUTPUT LISTED BELOW.         *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	0.00E+00
1000.0	0.6	0 : 37.3	1.78E-15
2000.0	1.2	1 : 14.6	8.63E-09
3000.0	1.9	1 : 51.8	3.64E-07
8000.0	5.0	4 : 58.3	4.75E-06
20000.0	12.4	12 : 25.6	5.05E-06

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.55E-02	0.00E+00
1000.0	0.6	2.21E-02	1.76E-09
2000.0	1.2	1.81E-02	8.52E-03
3000.0	1.9	1.60E-02	3.59E-01
8000.0	5.0	1.29E-02	4.68E+00
20000.0	12.4	1.53E-03	4.98E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.04E-01	0.00E+00
1000.0	0.6	1.77E-01	1.41E-08
2000.0	1.2	1.45E-01	6.81E-02
3000.0	1.9	1.28E-01	2.87E+00
8000.0	5.0	1.03E-01	3.75E+01
20000.0	12.4	1.22E-02	3.99E+01

IRDAM SCENARIO 15
GROSS IODINE (H=100 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1705 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 32.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: >= 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS.
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	3.53E-06
1000.0	0.6	0 : 3.7	2.70E-06
2000.0	1.2	0 : 7.5	6.08E-07
3000.0	1.9	0 : 11.2	1.99E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.18E-04	9.35E+00
1000.0	0.6	9.07E-05	7.16E+00
2000.0	1.2	2.04E-05	1.61E+00
3000.0	1.9	6.66E-06	5.27E-01
8000.0	5.0	1.24E-06	9.83E-02
20000.0	12.4	5.57E-07	4.40E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	9.47E-04	7.48E+01
1000.0	0.6	7.25E-04	5.73E+01
2000.0	1.2	1.63E-04	1.29E+01
3000.0	1.9	5.33E-05	4.21E+00
8000.0	5.0	9.95E-06	7.86E-01
20000.0	12.4	4.46E-06	3.52E-01

IRDAM SCENARIO 16
GROSS IODINE (H=100 m)

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 29SEPT82

CURRENT TIME: 1700 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR GROSS RELEASE RATE:

GROSS RELEASE RATE (CI/SEC): 1.00E+00

IODINE, NOBLE GAS, AND FILTER EFFICIENCY INPUTS:

PERCENTAGE IODINE: 100.00

PERCENTAGE NOBLE GAS: 0.00

IODINE TO NOBLE GAS RATIO: 1.70E+38

PERCENTAGE OF IODINES REMOVED BY FILTRATION: 0.00

TIME INTERVAL FROM REACTOR SHUTDOWN
TO INITIATION OF RELEASE(HR): 2.00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS.
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	3.53E-06
1000.0	0.6	0 : 3.7	2.70E-06
2000.0	1.2	0 : 7.5	6.08E-07
3000.0	1.9	0 : 11.2	1.99E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.07E-03	3.48E+00
1000.0	0.6	8.17E-04	2.67E+00
2000.0	1.2	1.84E-04	6.00E-01
3000.0	1.9	6.00E-05	1.96E-01
8000.0	5.0	1.12E-05	3.66E-02
20000.0	12.4	5.02E-06	1.64E-02

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	8.53E-03	2.79E+01
1000.0	0.6	6.53E-03	2.13E+01
2000.0	1.2	1.47E-03	4.80E+00
3000.0	1.9	4.80E-04	1.57E+00
8000.0	5.0	8.96E-05	2.93E-01
20000.0	12.4	4.02E-05	1.31E-01

IRDAM SCENARIO 17
 ^{133}Xe

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0930 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR XE133

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 8000.0 AND 20000.0 METERS.   *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	0.00E+00
1000.0	0.6	0 : 37.3	1.78E-15
2000.0	1.2	1 : 14.6	8.63E-09
3000.0	1.9	1 : 51.8	3.64E-07
8000.0	5.0	4 : 58.3	4.75E-06
20000.0	12.4	12 : 25.6	5.05E-06

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	6.71E-04	0.00E+00
1000.0	0.6	5.87E-04	0.00E+00
2000.0	1.2	5.48E-04	0.00E+00
3000.0	1.9	5.53E-04	0.00E+00
8000.0	5.0	7.93E-04	0.00E+00
20000.0	12.4	1.70E-04	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	5.37E-03	0.00E+00
1000.0	0.6	4.70E-03	0.00E+00
2000.0	1.2	4.38E-03	0.00E+00
3000.0	1.9	4.43E-03	0.00E+00
8000.0	5.0	6.34E-03	0.00E+00
20000.0	12.4	1.36E-03	0.00E+00

IRDAM SCENARIO 18

^{133}Xe

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0915 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR XE133

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS. *
* SEE SUMMARY OUTPUT LISTED BELOW.      *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	3.53E-06
1000.0	0.6	0 : 3.7	2.70E-06
2000.0	1.2	0 : 7.5	6.08E-07
3000.0	1.9	0 : 11.2	1.99E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.19E-04	0.00E+00
1000.0	0.6	9.08E-05	0.00E+00
2000.0	1.2	2.04E-05	0.00E+00
3000.0	1.9	6.68E-06	0.00E+00
8000.0	5.0	1.25E-06	0.00E+00
20000.0	12.4	5.58E-07	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	9.48E-04	0.00E+00
1000.0	0.6	7.27E-04	0.00E+00
2000.0	1.2	1.63E-04	0.00E+00
3000.0	1.9	5.34E-05	0.00E+00
8000.0	5.0	9.97E-06	0.00E+00
20000.0	12.4	4.47E-06	0.00E+00

IRDAM SCENARIO 19
 ^{133}Xe

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0845 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR XE133

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 3000.0 AND 8000.0 METERS.    *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
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DISTANCE (METERS)	(MILES)	PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	1.48E-16
1000.0	0.6	0 : 37.3	7.53E-08
2000.0	1.2	1 : 14.6	9.66E-06
3000.0	1.9	1 : 51.8	2.50E-05
8000.0	5.0	4 : 58.3	2.68E-05
20000.0	12.4	12 : 25.6	1.25E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.80E-03	0.00E+00
1000.0	0.6	1.71E-03	0.00E+00
2000.0	1.2	2.09E-03	0.00E+00
3000.0	1.9	2.66E-03	0.00E+00
8000.0	5.0	9.00E-04	0.00E+00
20000.0	12.4	4.19E-04	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.44E-02	0.00E+00
1000.0	0.6	1.37E-02	0.00E+00
2000.0	1.2	1.67E-02	0.00E+00
3000.0	1.9	2.12E-02	0.00E+00
8000.0	5.0	7.20E-03	0.00E+00
20000.0	12.4	3.35E-03	0.00E+00

IRDAM SCENARIO 20
 ^{133}Xe

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0830 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE 111

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR XE133

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS. *
* SEE SUMMARY OUTPUT LISTED BELOW.     *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	9.45E-06
1000.0	0.6	0 : 3.7	3.22E-06
2000.0	1.2	0 : 7.5	6.20E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.17E-04	0.00E+00
1000.0	0.6	1.08E-04	0.00E+00
2000.0	1.2	2.08E-05	0.00E+00
3000.0	1.9	6.70E-06	0.00E+00
8000.0	5.0	1.25E-06	0.00E+00
20000.0	12.4	5.59E-07	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.54E-03	0.00E+00
1000.0	0.6	8.66E-04	0.00E+00
2000.0	1.2	1.67E-04	0.00E+00
3000.0	1.9	5.36E-05	0.00E+00
8000.0	5.0	9.98E-06	0.00E+00
20000.0	12.4	4.47E-06	0.00E+00

IRDAM SCENARIO 21
 ^{137}Cs

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1010 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR CS137

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 8000.0 AND 20000.0 METERS.   *
* SEE SUMMARY OUTPUT LISTED BELOW.     *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	0.00E+00
1000.0	0.6	0 : 37.3	1.78E-15
2000.0	1.2	1 : 14.6	8.63E-09
3000.0	1.9	1 : 51.8	3.64E-07
8000.0	5.0	4 : 58.3	4.75E-06
20000.0	12.4	12 : 25.6	5.05E-06

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.43E-02	0.00E+00
1000.0	0.6	1.35E-02	0.00E+00
2000.0	1.2	1.27E-02	0.00E+00
3000.0	1.9	1.25E-02	0.00E+00
8000.0	5.0	1.50E-02	0.00E+00
20000.0	12.4	1.87E-03	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.15E-01	0.00E+00
1000.0	0.6	1.08E-01	0.00E+00
2000.0	1.2	1.01E-01	0.00E+00
3000.0	1.9	1.00E-01	0.00E+00
8000.0	5.0	1.20E-01	0.00E+00
20000.0	12.4	1.50E-02	0.00E+00

IRDAM SCENARIO 22
 ^{137}Cs

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1005 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR CS137

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS.
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS)	(MILES)	PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	3.53E-06
1000.0	0.6	0 : 3.7	2.70E-06
2000.0	1.2	0 : 7.5	6.08E-07
3000.0	1.9	0 : 11.2	1.99E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.31E-03	0.00E+00
1000.0	0.6	1.00E-03	0.00E+00
2000.0	1.2	2.25E-04	0.00E+00
3000.0	1.9	7.25E-05	0.00E+00
8000.0	5.0	1.37E-05	0.00E+00
20000.0	12.4	6.15E-06	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.04E-02	0.00E+00
1000.0	0.6	8.00E-03	0.00E+00
2000.0	1.2	1.80E-03	0.00E+00
3000.0	1.9	5.88E-04	0.00E+00
8000.0	5.0	1.10E-04	0.00E+00
20000.0	12.4	4.92E-05	0.00E+00

IRDAM SCENARIO 23
 ^{137}Cs

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0955 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR CS137

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 3000.0 AND 8000.0 METERS.    *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
*****

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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	1.48E-16
1000.0	0.6	0 : 37.3	7.53E-08
2000.0	1.2	1 : 14.6	9.66E-06
3000.0	1.9	1 : 51.8	2.50E-05
8000.0	5.0	4 : 58.3	2.68E-05
20000.0	12.4	12 : 25.6	1.25E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.59E-02	0.00E+00
1000.0	0.6	2.04E-02	0.00E+00
2000.0	1.2	2.00E-02	0.00E+00
3000.0	1.9	1.96E-02	0.00E+00
8000.0	5.0	9.91E-03	0.00E+00
20000.0	12.4	4.61E-03	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.07E-01	0.00E+00
1000.0	0.6	1.63E-01	0.00E+00
2000.0	1.2	1.60E-01	0.00E+00
3000.0	1.9	1.57E-01	0.00E+00
8000.0	5.0	7.93E-02	0.00E+00
20000.0	12.4	3.69E-02	0.00E+00

IRDAM SCENARIO 24
 ^{137}Cs

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 0950 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TD): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR CS137

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND    500.0 METERS. *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	9.45E-06
1000.0	0.6	0 : 3.7	3.22E-06
2000.0	1.2	0 : 7.5	6.20E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	3.50E-03	0.00E+00
1000.0	0.6	1.19E-03	0.00E+00
2000.0	1.2	2.29E-04	0.00E+00
3000.0	1.9	7.38E-05	0.00E+00
8000.0	5.0	1.37E-05	0.00E+00
20000.0	12.4	6.16E-06	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.80E-02	0.00E+00
1000.0	0.6	9.54E-03	0.00E+00
2000.0	1.2	1.83E-03	0.00E+00
3000.0	1.9	5.91E-04	0.00E+00
8000.0	5.0	1.10E-04	0.00E+00
20000.0	12.4	4.92E-05	0.00E+00

IRDAM SCENARIO 25
88_{Kr}

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1245 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR KR88

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 8000.0 AND 20000.0 METERS.   *
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	0.00E+00
1000.0	0.6	0 : 37.3	1.78E-15
2000.0	1.2	1 : 14.6	8.63E-09
3000.0	1.9	1 : 51.8	3.64E-07
8000.0	5.0	4 : 58.3	4.75E-06
20000.0	12.4	12 : 25.6	5.05E-06

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.99E-02	0.00E+00
1000.0	0.6	2.46E-02	0.00E+00
2000.0	1.2	1.85E-02	0.00E+00
3000.0	1.9	1.49E-02	0.00E+00
8000.0	5.0	7.40E-03	0.00E+00
20000.0	12.4	8.49E-03	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	2.40E-01	0.00E+00
1000.0	0.6	1.97E-01	0.00E+00
2000.0	1.2	1.48E-01	0.00E+00
3000.0	1.9	1.20E-01	0.00E+00
8000.0	5.0	5.92E-02	0.00E+00
20000.0	12.4	6.79E-02	0.00E+00

IRDAM SCENARIO 26

88_{Kr}

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1240 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 100.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TD): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIIC RELEASE RATE:

FOR KR88

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS.
* SEE SUMMARY OUTPUT LISTED BELOW.    *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/O VALUE
500.0	0.3	0 : 1.9	3.53E-06
1000.0	0.6	0 : 3.7	2.70E-06
2000.0	1.2	0 : 7.5	6.08E-07
3000.0	1.9	0 : 11.2	1.99E-07
8000.0	5.0	0 : 27.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	5.93E-03	0.00E+00
1000.0	0.6	4.54E-03	0.00E+00
2000.0	1.2	1.02E-03	0.00E+00
3000.0	1.9	3.34E-04	0.00E+00
8000.0	5.0	6.23E-05	0.00E+00
20000.0	12.4	2.79E-05	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.74E-02	0.00E+00
1000.0	0.6	3.63E-02	0.00E+00
2000.0	1.2	8.17E-03	0.00E+00
3000.0	1.9	2.67E-03	0.00E+00
8000.0	5.0	4.98E-04	0.00E+00
20000.0	12.4	2.23E-04	0.00E+00

IRDAM SCENARIO 27

88_{Kr}

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1025 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 0.4

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: F

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR KR38

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN 3000.0 AND 8000.0 METERS.    *
* SEE SUMMARY OUTPUT LISTED BELOW.     *
*****

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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 18.6	1.48E-16
1000.0	0.6	0 : 37.3	7.53E-08
2000.0	1.2	1 : 14.6	9.66E-06
3000.0	1.9	1 : 51.8	2.50E-05
8000.0	5.0	4 : 58.3	2.68E-05
20000.0	12.4	12 : 25.6	1.25E-05

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	5.10E-02	0.00E+00
1000.0	0.6	3.35E-02	0.00E+00
2000.0	1.2	2.60E-02	0.00E+00
3000.0	1.9	2.02E-02	0.00E+00
8000.0	5.0	4.50E-02	0.00E+00
20000.0	12.4	2.10E-02	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS)	(MILES)	WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	4.08E-01	0.00E+00
1000.0	0.6	2.68E-01	0.00E+00
2000.0	1.2	2.08E-01	0.00E+00
3000.0	1.9	1.62E-01	0.00E+00
8000.0	5.0	3.60E-01	0.00E+00
20000.0	12.4	1.68E-01	0.00E+00

IRDAM SCENARIO 28
88_{Kr}

***** INPUT INFORMATION *****

USER NAME: JOHN HEDGEFIELD

TODAY'S DATE: 30SEPT82

CURRENT TIME: 1020 PST

REACTOR NAME: GENERIC

NET ELECTRICAL OUTPUT: 1000

CONTAINMENT TYPE: EITHER A PWR OR BWR-TYPE III

EFFECTIVE STACK HEIGHT(M): 60.0

ELEVATED LEVEL WIND SPEED (M/SEC): 4.5

ELEVATED LEVEL WIND DIRECTION (TO): NO PREDOMINANT DIRECTION.

STABILITY CLASS: B

INPUTS FOR ISOTOPIC RELEASE RATE:

FOR KR88

THE RELEASE RATE (CI/SEC): 1.00E+00

TIME ESTIMATE FOR TOTAL DURATION
OF RELEASE(HR): 8.00

TIME ESTIMATE FROM RADIATION MEASUREMENT TO
THE MATERIAL'S PROJECTED TIME OF RELEASE(HR): 0.00

AGE OF RELEASED MATERIAL: < 1 DAY

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*****
* ELEVATED PLUME HAS TOUCHED DOWN      *
* BETWEEN      0.0 AND      500.0 METERS. *
* SEE SUMMARY OUTPUT LISTED BELOW.      *
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*****
***** PLUME INFORMATION *****
*****

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DISTANCE (METERS) (MILES)		PLUME TRAVEL TIME (HOURS:MINUTES)	CHI/Q VALUE
500.0	0.3	0 : 1.9	9.45E-06
1000.0	0.6	0 : 3.7	3.22E-06
2000.0	1.2	0 : 7.5	6.20E-07
3000.0	1.9	0 : 11.2	2.00E-07
8000.0	5.0	0 : 29.8	3.71E-08
20000.0	12.4	1 : 14.6	1.66E-08

 ***** SUMMARY *****

CALCULATED DOSE RATES (REM/HR):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.59E-02	0.00E+00
1000.0	0.6	5.41E-03	0.00E+00
2000.0	1.2	1.04E-03	0.00E+00
3000.0	1.9	3.35E-04	0.00E+00
8000.0	5.0	6.24E-05	0.00E+00
20000.0	12.4	2.79E-05	0.00E+00

CALCULATED DOSES (REMS):

DISTANCE (METERS) (MILES)		WHOLE BODY 5cm DEPTH	INFANT THYROID
500.0	0.3	1.27E-01	0.00E+00
1000.0	0.6	4.33E-02	0.00E+00
2000.0	1.2	8.33E-03	0.00E+00
3000.0	1.9	2.68E-03	0.00E+00
8000.0	5.0	4.99E-04	0.00E+00
20000.0	12.4	2.24E-04	0.00E+00

KEY TO FIGURES 1-3

Figures 1-3 show dose rates calculated for 1 Ci/s gross noble gas releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>	<u>Decay Time</u>
I	0	B	10 mph	32 hr
II	0	B	10 mph	2 hr
III	0	F	1 mph	2 hr
IV	0	F	1 mph	32 hr

FIGURE 1. IRDAM Gross Noble Gas for H=0

FIGURE 2. WRAITH Gross Noble Gas for H=0

FIGURE 3. RADPUR Gross Noble Gas for H=0

KEY TO FIGURES 4-6

Figures 4-6 show dose rates calculated for 1 Ci/s gross radioiodine releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>	<u>Decay Time</u>
I	0	B	10 mph	2 hr
II	0	F	1 mph	2 hr
III	0	F	1 mph	32 hr
IV	0	B	10 mph	32 hr

Note that IRDAM calculates infant thyroid dose, WRAITH uses adult thyroid parameters, and RADPUR uses child thyroid parameters.

FIGURE 4. IRDAM Gross Iodine for H=0 (Infant Thyroid)

FIGURE 5. WRAITH Gross Iodine for H=0 (Adult Thyroid)

FIGURE 6. RADPUR Gross Iodine for H=0 (Child Thyroid)

KEY TO FIGURES 7-9

Figures 7-9 show dose rates calculated for 1 Ci/s gross radioiodine releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>	<u>Decay Time</u>
I	60 m	B	10 mph	2 hr
II	60 m	B	10 mph	32 hr
III	60 m	F	1 mph	32 hr
IV	60 m	F	1 mph	2 hr

Note that IRDAM calculates infant thyroid dose, WRAITH uses adult thyroid parameters, and RADPUR uses child thyroid parameters.

FIGURE 7. IRDAM Gross Iodine for H=60m (Infant Thyroid)

FIGURE 8. WRAITH Gross Iodine for H=60m (Adult Thyroid)

FIGURE 9. RADPUR Gross Iodine for H=60m (Child Thyroid)

KEY TO FIGURES 10-12

Figures 10-12 show dose rates calculated for 1 Ci/s gross radioiodine releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>	<u>Decay Time</u>
I	100 m	F	1 mph	32 hr
II	100 m	F	1 mph	2 hr
III	100 m	B	10 mph	32 hr
IV	100 m	B	10 mph	2 hr

Note that IRDAM calculates infant thyroid dose, WRAITH uses adult thyroid parameters, and RADPUR uses child thyroid parameters.

FIGURE 10. IRDAM Gross Iodine for H=100m (Infant Thyroid)

FIGURE 11. WRAITH Gross Iodine for H=100m (Adult Thyroid)

FIGURE 12. RADPUR Gross Iodine for H=100m (Child Thyroid)

KEY TO FIGURES 13-15

Figures 13-15 show dose rates calculated for 1 Ci/s ^{133}Xe releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>
I	100 m	F	1 mph
II	100 m	B	10 mph
III	60 m	F	1 mph
IV	60 m	B	10 mph

FIGURE 13. IRDAM ^{133}Xe

FIGURE 14. WRAITH ^{133}Xe

FIGURE 15. RADPUR ^{133}Xe

KEY TO FIGURES 16 and 17

Figures 16 and 17 show dose rates calculated for 1 Ci/s ^{137}Cs releases under four sets of conditions and using two different models, IRDAM and WRAITH. (RADPUR does not include ^{137}Cs). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>
I	100 m	F	1 mph
II	100 m	B	10 mph
III	60 m	F	1 mph
IV	60 m	B	10 mph

FIGURE 16. IRDAM ^{137}Cs

FIGURE 17. WRAITH ^{137}Cs

KEY TO FIGURES 18-20

Figures 18-20 show dose rates calculated for 1 Ci/s ^{88}Kr releases under four sets of conditions and using three different models (IRDAM, WRAITH and RADPUR). Each figure shows the results for a single model with the plot for a particular set of conditions indicated by Roman numerals as follows:

<u>Roman Numeral</u>	<u>Release Height</u>	<u>Stability Class</u>	<u>Windspeed</u>
I	100 m	F	1 mph
II	100 m	B	10 mph
III	60 m	F	1 mph
IV	60 m	B	10 mph

FIGURE 18. IRDAM ^{88}Kr

FIGURE 19. WRAITH ^{88}Kr

FIGURE 20. RADPUR ^{88}Kr

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7. AUTHOR(S) RW Poeton, MP Moeller, GJ Laughlin, AE Desrosiers				3. RECIPIENT'S ACCESSION NO.	
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16. ABSTRACT (200 words or less) <p>The Interactive Rapid Dose Assessment Model (IRDAM) is a tool to assist respondents to radiological emergencies. It is intended to provide the user with a capability that is easily portable and user friendly so that it may be used at any location (HQ, Base Team, or Site Team) while the staff is not fully augmented to scope the extent of the problem. IRDAM is the micro computer based system containing a dose projection routine. The hardware and software package is an initial effort to demonstrate the feasibility of a deployable system that is sufficiently flexible to deal with a variety of radiological emergencies. This volume provides a comparison of dose projection estimates for a variety of accident scenarios, release pathways, and meteorological conditions for several models including that in IRDAM.</p>					
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