005 – PM 1059 Rev 2 FHA

Exelon Nuclear

ATTACHMENT 1
Design Analysis Cover Sheet

CC-AA-309-1001
Revision 1

Last Page No. 17

Analysis No.	PM-1059	**Revision**	2
EC/ECR No.	PB ~~02-00838~~ 03-00292	**Revision**	0
Title:	Re-analysis of Fuel Handling Accident (FHA) Using Alternative Source Terms		

		Component(s)	
Station(s)	Peach Bottom Atomic Power Station		
Unit No.:	2 and 3	N/A	
Discipline	SEAQ		
Description Code/ Keyword	FHA		
Safety Class	S		
System Code	912		
Structure	N/A		

CONTROLLED DOCUMENT REFERENCES

Document No.	**From/To**	**Document No.**	**From/To**
UFSAR Section 14.6.4	From/To	Dwg. M-5	From
Calc. PM-1055	From	Dwg. C-23	From
Calc. PM-737	From	Dwg. A-9	From
Calc. ME-325	From	Dwg. M-18	From
Dwg M-3, Sheet 1	From	Dwg. M-19	From
Dwg. M-352, Sheet 4	From		

Is this Design Analysis Safeguards? Yes ☐ No ☒

Does this Design Analysis Contain Unverified Assumptions? Yes ☐ No ☒ ATI/AR#

Is a Supplemental Review Required? Yes ☐ No ☒ If yes, complete Attachment 3

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Method of Review ☒ Detailed Review ☐ Alternate Calculations ☐ Testing

Review Notes:

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Description of Revision (list affected pages for partials): All pages affected. Revision to incorporate responses to NRC June 29, 2004 Request for Additional Information regarding justification for the conservatism of the Source Terms, and potential additional release pathways and their acceptability with respect to fuel decay times when the secondary containment is inoperable. Also, incorporation of the more conservative Tech. Spec. 3.7.7 minimum spent fuel pool water level for fuel movement instead of the previous minimum level for pool cooling operation with scuppers all the way down.

THIS DESIGN ANALYSIS SUPERCEDES: Design Analysis PM-1059, Rev. 1

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Attachments

A. Source Terms [13 pgs.]
B. RADTRAD Runs [pgs.]
C. FHA RADTRAD Nuclide Information File [10 pgs., unchanged from Rev. 1]
D. FHA Release Fraction File [1 pg., unchanged from Rev. 1]
E. Computer Disclosure Sheets [2 pgs.]
F. PBAPS Fuel Handling Accident Assessment of Limiting Event [2 pgs]
G. Evaluation of Worst-Case Control Room χ/Q For Release from Ground Hatches, Roof Scuttles, Personnel Access Doors and Railroad Bay Doors [60 pgs.]

1. PURPOSE/OBJECTIVE

The purpose of this calculation is to apply Alternative Source Term (AST) methodology to the analysis of the design basis Fuel Handling Accident (FHA) for Peach Bottom Atomic Power Station (PBAPS) Units 2 & 3. This calculation considers normal (unfiltered) exhaust through the building ventilation stack (Cases 1 and 2, unchanged from the previous Revision 1 of this calculation), with no Control Room Emergency Filtration (CREF) system operation. Therefore, this calculation supports changes to the current PBAPS 2 & 3 Technical Specifications to consider that the operability of emergency filtration systems and subsystems previously required to mitigate the radiological consequences of fuel handling accidents may not be necessary after a sufficient post-shutdown decay period (as determined herein) has elapsed.

Not having to consider secondary containment and control room integrity and filtration requirements in support of refueling activities has the potential to significantly improve the flexibility and duration of scheduled plant outage activities.

The doses calculated for Cases 1 and 2 are unchanged from those of the previous Revision 1 of this calculation. Additional cases 3 through 6 are included in this Rev. 2 based on the new χ/Q values determined in Attachment G for no secondary containment isolation and releases through various potential openings in the secondary containment. Various decay periods before fuel movement are assumed for Cases 3 through 6 to determine the post-shutdown decay periods such that secondary containment integrity and filtration previously required to mitigate the radiological consequences of fuel handling accidents would not be necessary, with no CREF in operation except for Case 6.

Regulatory Guide (RG) 1.183 (Ref. 2) is the basis for this evaluation. Concerning the FHA, the new guidance has the advantage of smaller gap fractions, a larger pool decontamination factor [DF], and dose criteria that replace both the whole body and thyroid dose limits with a limit on Total Effective Dose Equivalent [TEDE].

The other changes from the current UFSAR calculation are listed below.

- An offsite dose limit of 6.3 rem TEDE (RG 1.183 & 10 CFR 50.67(b)(2)(iii)) is applied instead of the Standard Review Plan (SRP) 15.7.4 values of 25% of the 10CFR100 limits.
- A control room dose limit of 5-rem TEDE (10 CFR 50 Appendix B (II) GDC 19) is applied instead of the SRP 15.7.4 values of 5 rem whole body, or its equivalent.
- Design Basis analysis is based on NRC RG 1.183.
- The Control Room and offsite χ/Q's were recalculated in accordance with RG 1.183 and its references for release from the Unit 2 & 3 Turbine Building (TB)/Reactor Building (RB) Ventilation Stack and from credible potential Building openings when secondary containment is inoperable, and the new limiting χ/Q's were applied to this analysis.
- Secondary Containment automatic isolation and filtration are not credited.
- Dose Conversion Factors (DCFs) for Immersion and Inhalation are taken from Federal Guidance Reports (FGRs) 12 (Ref. 5) and 11 (Ref. 4), respectively. RG 1.183 cites these DCFs as acceptable current estimates for evaluating the radiological impact of nuclear plant accidents.

This calculation also documents the development and conservatism of core source terms to be used in this and other design basis accident analyses that involve postulated fuel damage and are being reanalyzed using alternative source terms.

2. METHODOLOGY AND ACCEPTANCE CRITERIA

Analyses of radiological consequences resulting from a design basis Fuel Handling Accident (FHA) are performed using the guidance for application of Alternative Source Terms to this event in RG 1.183.

Analyses of radiation transport and dose assessment are performed using RADTRAD v. 3.03. RADTRAD is a simplified model of RADionuclide Transport and Removal And Dose Estimation developed for the NRC and endorsed by the NRC as an acceptable methodology for reanalysis of the radiological consequences of design basis accidents. The technical basis for the RADTRAD code is documented in Section 2 of NUREG/CR-6604 (Ref. 3). The methodologies significant to this analysis are the dose consequence analysis (NUREG Section 2.3) and the Radioactive Decay Calculations (NUREG Section 2.4). This version of RADTRAD has been pre-qualified for safety related design analysis by Washington Group International per its 10CFR50 Appendix B Quality Assurance program.

2.1. Fuel Source Term Model

The fuel source term is based on the reactor core source terms and conservative treatment described in Attachment A.

The fraction of the core fuel damaged is based on the References 10 and 16 GESTAR II limiting case of damaging 172 fuel pins (based on a "Heavy Mast" design as per reference 13; i.e., the "NF500 mast" in Reference 10) from GE12 or GE14 10x10 fuel bundle arrays with the equivalent of 87.33 pins per bundle, and with all of the damaged fuel assumed to have a limiting Peaking Factor (PF) of 1.7. This analysis is for an assembly and mast drop from the maximum height allowed by the refueling platform over the reactor well onto fuel in the reactor, and bounds all locations in terms of fuel damage potential. Based on fuel damage assessments in reference 16 and as shown below, this bounds the 8x8 array fuel types with 60 fuel pins per bundle, 111 failed pins and a 1.5 PF (and up to a potential future 1.8 PF); it also bounds GE11 or GE13 9x9 array fuel types with 74 fuel pins per bundle,140 failed pins and a 1.5 PF (and up to a 1.76 PF).

Bundle Type	Fuel Array	Pins in Bundle	Failed Pins	Damaged Core Fraction	PF	Damaged Core Fraction with PF
Various	8x8	60	111	0.002421	1.5	**0.003632**
GE11&GE13	9x9	74	140	0.002476	1.5	**0.003714**
GE12&GE14	10x10	87.33	172	0.002578	1.7	**0.004382**

With a 1.7 radial peaking factor, the associated power of the damaged fuel = 3528 MWth * 0.002578 * 1.7 = 15.46 MWth.

2.2. Evaluation of Conservative Time after Shutdown for Fuel Movement

Because of radioactivity decay, the worst case fuel handling accident is that associated with handling fuel that has most recently been part of a critical core operating at full power. As per the RG 1.25 (Ref. 14) based fuel handling accident analysis in Reference 12, movement of irradiated fuel will not occur less than 24 hours after the associated reactor shutdown, and

therefore, a 24 hour delay period is used as a minimum. This value continues to be a very conservative assumption for BWRs, given the operations necessary before commencing fuel movement.

At the time of this calculation, certain technical specification sections require secondary containment integrity, SGTS system operability, etc. during irradiated fuel movement. Unlike the previous FHA analysis in Ref. 12, these design features have been determined to not be required to meet regulatory limits and are not credited in this calculation. Guidance in TSTF-51 suggests that "recently irradiated fuel" parameter be developed to identify the point in time after shutdown when secondary containment features are required. Therefore, this calculation also provides the result of a search for this time after shutdown for various limiting potential release pathways.

2.3. Gap Activity

This calculation is applicable to fuel whose burnup and power limits are bounded by those specified in RG 1.183, footnote 11. This allows application of the gap activity fractions for LOCA events per RG 1.183, Table 3, which are as follows:

- 5% of the noble gases (excluding Kr-85)
- 10% of the Kr-85
- 5% of the iodine inventory (excluding I-131)
- 8% of the I-131
- 12% of the Alkali metal inventory

Because RADTRAD does not allow for application of isotope specific release fractions, the "Peach Bottom AST Source Term.nif" file is modified to accommodate the differential gap activities among the halogen (I-131) and noble gas (Kr-85) gap fractions dictated by Reg. Guide 1.183 (Ref. 2) shown above. Therefore, the initial activity of isotope I-131 and Kr-85 are multiplied by 1.6, and 2.0, respectively, in order to accommodate the respective 10% and 8% release fractions directed by regulatory guidance (Ref. 2).

2.4. Pool Decontamination Factor (DF)

Attachment F provides assessments of water coverage and effective DFs considering FHAs over the reactor well and the spent fuel pool, and identifies that the drop over the reactor well is more limiting. Water coverage over the reactor well is ~52 feet, but no further credit is taken for the additional water depth in order to maintain conservatism and consistency with regulatory guidance.

For a drop over the spent fuel pool, coverage over the dropped assemblies and the plenum in struck assemblies are slightly less than 23 feet. As shown in Attachment F, coverage is sufficient to maintain a 200 DF based on the Reg. Guide 1.183 Appendix C recommended 500 DF for inorganic iodines, and the recommended inorganic/organic iodine ratios. Even if a lower inorganic iodine DF is selected to force an overall 200 DF with 23 feet of pool coverage, the reduction in DF is offset by reductions in fuel damage due to a much shorter drop over the spent fuel pool.

2.5. Release Model

Release modeling uses the RADTRAD computer program. As discussed above, the normal Nuclide Inventory File (NIF) representing a PBAPS core is artificially adjusted to account for the higher than average gap fractions for I-131 and Kr-85 provided by Reg. Guide 1.183.

The compartments are the Refuel Floor Air Space (in the Reactor Building), the Environment, and the Control Room. The refuel floor exhaust rate is set artificially high at 6 air changes per hour. This results in 99.9999% of the contained radioactivity being exhausted within two hours. The exhaust point that is postulated under the no filtration condition is the TB/RB Building Ventilation Stack. This particular release point results in specific dispersion characteristics which are defined by unique dispersion factors, or χ/Q's.

2.6. Dispersion Model

Dispersion factors at given increments in time for the TB/RB Ventilation Stack release point are obtained from reference 7. The χ/Q's are based on DG-1111 methodology as implemented by ARCON96 for onsite locations (Control Room) and on Reg. Guide. 1.145 methodology as implemented by PAVAN for offsite locations (EAB & LPZ). AST onsite and offsite χ/Q values generated in reference 7 were used.

Dispersion factors at given increments in time for various limiting potential Building opening conditions with secondary containment not required are calculated using the same methodology in Attachment G.

2.7. Control Room Model

The Control Room, as analyzed for the TB/RB Ventilation Stack release FHA analysis cases, is unfiltered. Normal flow intake rates, plus an unfiltered inleakage flow, is used with a corresponding exhaust rate on a once-through basis.

An additional case is analyzed for the release pathway through the worst case hatch location, with the Control Room filter in operation at the worst case 3000 – 10% = 2700 cfm, with an additional assumed 500 cfm of unfiltered inleakage.

2.8. Dose Modeling

Dose models for both onsite and offsite are simplified and meet R.G. 1.183 requirements. Dose conversion factors are based on Federal Guidance Reports 11 and 12 (Ref. 4, 5). Effectively, RADTRAD uses the following formulations, integrated numerically over the accident duration:

2.8.1. EAB and LPZ

Doses at the EAB and LPZ for the FHA are based on the following formulas:

$$\text{Dose}_{\text{CEDE}}\ (\text{rem}) = \text{Release (Curies)} * \frac{\chi}{Q}(\text{sec/m}^3) * \text{Breathing Rate}\ (\text{m}^3/\text{sec}) * \text{Inhalation DCF}\ (\text{rem}_{\text{CEDE}}/\text{Ci inhaled})$$

and

$$\text{Dose}_{EDE}\ (\text{rem}) = \text{Release (Curies)} * \frac{\chi}{Q}(\text{sec/m}^3) * \text{Submersion DCF}\ (\text{rem}_{EDE} - \text{m}^3/\text{Ci-sec})$$

and finally,

$$Dose_{TEDE}\ (rem) = Dose_{CEDE}\ (rem) + Dose_{EDE}(rem)$$

2.8.2. Control Room

The formulas used by RADTRAD, by time increment, are:

$$\text{Dose}_{CEDE}\ (\text{rem}) = \text{Time Dependent CR Air Concentration (Ci/m}^3) * \text{Time Increment Duration (sec)} * \text{Breathing Rate (m}^3\text{/sec)} * \text{Inhalation DCF (rem}_{CEDE}\text{/Ci inhaled)} * \text{Occupancy Factor of 1}$$

and

$$\text{Dose}_{EDE}\ (\text{rem}) = \text{Time Dependent CR Air Concentration (Ci/m}^3) * \text{Time Increment Duration (sec)} * \text{Submersion DCF (rem}_{EDE} - \text{m}^3/\text{Ci-sec)} * \text{Occupancy Factor of 1} * \text{CR Geometry Factor}$$

and finally,

$$\text{Dose}_{TEDE}\ (\text{rem}) = \text{Dose}_{CEDE}\ (\text{rem}) + \text{Dose}_{EDE}\ (\text{rem})$$

2.9. Acceptance Criteria

Dose acceptance criteria are per 10CFR50.67 and R.G. 1.183 guidance.

Table 1 lists the regulatory limits for accidental dose to 1) a control room operator, 2) a person at the EAB, and 3) a person at the LPZ boundary.

Table 1. Regulatory Dose Limits (Rem TEDE)*

CR (30 days)	EAB (2 hours)	LPZ (30 days
5	6.3	6.3

3. ASSUMPTIONS

Assumptions and bounding analyzed conditions regarding the fuel handling accident scenarios are provided below.

1. Movement of recently irradiated fuel will not occur less than 24 hours after the associated reactor shutdown. Other periods are evaluated to establish a basis for a definition of "recently irradiated fuel" for various potential release pathways.

2. Fuel bundle peak burnup will not exceed 62 GWD/MTU.

3. For fuel exceeding 54 GWD/MTU the maximum linear heat generation rate will not exceed 6.3 kW/ft average power.

4. The current design basis bounding fuel damage assessment scenario, which is associated with a drop over the reactor core, will be used.

5. Spent fuel source terms are based on reactor core source terms in Attachment A.

6. The damaged fuel is assumed to have operated at a radial peaking factor of 1.7 (Ref. 10).

7. For conservatism, the effective minimum depth of 23 feet is assumed to be the water coverage over the reactor core; the worst case location for a fuel drop FHA to take place.

8. Activity reaching the refuel floor airspace will essentially be all exhausted within 2 hours by using an artificially high exhaust rate. This also provides an allowance for uneven mixing in the refuel floor airspace.

9. The release pathways are through TB/RB Ventilation Stack for Cases 1 and 2, or through worst-case potentially open hatch locations, for Cases 3 through 6. No credit is taken for filtration by the SGTS, or the elevated release resulting from exhaust through the PBAPS Main Stack.

10. Except for Case 6 with releases through the worst-case hatch, no credit is taken for the operation of the CREF system during the FHA. For Cases 1 through 5, normal intake and outflow are credited, without filtration, including an allowance for unfiltered inleakage.

4. DESIGN INPUT

The design inputs used for this calculation were extracted from extensive review of PBAPS Units 2 & 3 Licensing documents, existing calculations, and regulatory guidance documents. These parameters are summarized in the following table:

Parameters Applicable to AST Fuel Handling Accident Dose Considerations for Peach Bottom Atomic Power Station

TABLE 2: FHA AST Analysis Parameter or Method for Peach Bottom Atomic Power Station	AST Value	Source Documents
Reactor Power	3528 MWth	Calc. No. PM-737, Rev. 1A
Fuel Assembly Configuration and properties	10x10 in a 87.33 fuel pin bundle and 172 pins damaged	Ref. 12
Peaking Factor	1.7	Ref. 10
Allowable Fuel Burnup and non-LOCA gap fractions		RG 1.183, Table 3
FHA Radionuclide Inventory	From Attachment A of this Calc. for the 60 isotopes forming the standard RADTRAD library, with decay to 24 hours. Gap activities per R.G. 1.183.	See Attachment A 24 hours per Ref. 12
Underwater Decontamination Factor	Noble Gases: 1 Particulate (cesiums and rubidiums): infinity Iodine: 200, corresponding to a 23-ft water depth	RG 1.183 RG 1.183
Iodine chemical distribution	From RG 1.183 (95% CsI, instantaneously dissociating in the pool water and re-evolving as elemental iodine, unless the pH of the pool water is justified mechanistically to be above 7; 4.85% elemental; 0.15% organic)	RG 1.183
Dose Conversion Factors	EPA Federal Guidance Reports 11 and 12	EPA Federal Guidance Reports 11 and 12
Offsite Dose Limit	6.3 rem TEDE after 2 hours	RG 1.183
Control Room Dose Limit	5 rem TEDE for the duration of the accident	10CFR50 App. A, GDC 19 and 10CFR50.67
Secondary Containment Automatic Isolation and Filtration	Not credited	RG 1.183

TABLE 2: FHA AST Analysis Parameter or Method for Peach Bottom Atomic Power Station	**AST Value**	**Source Documents**
Mitigation by CREF system	Not credited for all Cases except Case 6	RG 1.183
Normal Control Room Fresh Air Makeup Rate (Cases 1 through 5) and Volume	Design Basis Intake 20600 cfm plus an allowance of 1600 cfm for inleakage. Volume 176,000 ft^3	Ref. 15 Ref. 8
CREF Operation (for Case 6 only)	3000 – 10% cfm filtered intake (sensitivity analyses show the lower bound of the 10% flow uncertainty is conservative) plus an allowance of 500 cfm for unfiltered inleakage.	Ref. 17
Refuel Floor Normal Ventilation rate and volume	Approximately 6 air changes per hour and an artificial value of 100 ft^3 is used for simplicity. This evacuates 99.9999% of all activity within 2-hours.	
CR Normal Release Point and Distance to CR intake Dispersion Factors 0 – 2 hr Alternative Release Points	 TB/RB ventilation stack and 191.7 ft 1.18E-03 sec/m^3 As derived in Att. G	 Ref. 7
EAB Release Point Basis and Distance to EAB Dispersion Factors 0 – 2 hr	 Normal RB exhaust stack and 1040 m (considered as applicable to all release locations) 4.25E-04 sec/m^3	 Ref. 7
LPZ Release Point Basis and Distance to LPZ Dispersion Factors 0 – 8 hr	 Normal RB exhaust stack and 7300 m (considered as applicable to all release locations) 4.81E-05 sec/m^3	 Ref. 7

5. REFERENCES

1. Peach Bottom Units 2 & 3, UFSAR, Revision 18.

2. Regulatory Guide 1.183, "Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors", July 2000

3. NUREG/CR-6604, "RADTRAD: A Simplified Model for RADionuclide Transport and Removal And Dose Estimation", 4/1998. Supplement 1, 6/1999.

4. Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion", 1988.

5. Federal Guidance Report No. 12, External Exposure to Radionuclides in Air, Water, and Soil", 1993.

6. NUREG-1465, "Accident Source Terms for Light-Water Nuclear power Plants", 1995.

7. PBAPS Design Analysis PM-1055, "Calculation of Alternative Source Terms Onsite and Offsite $\chi/_Q$ Values", Rev. 0.

8. PBAPS Design Analysis PM-737, "Power Rerate LOCA Dose Verification and Rerated Doses", Rev. 1A.

9. G. Burley, "Evaluation of Fission Product Release and Transport," Staff Technical Paper, 1971.

10. NEDC-32868P, "GE14 Compliance With Amendment 22 of NEDE-24011-P-A (GESTAR II)", Rev. 1, September 2000.

11. NEDE–31152P, "General Electric Fuel Bundle Designs" February 1993.

12. PBAPS Design Analysis PM-738, "Power Rerate Fuel Drop Accident Dose Verification and Rerated Doses", Rev. A.

13. PBAPS A/R A1242063, Evaluation Number 31, "GE14 Impact on Refueling Accident" 14SEP00

14. 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 (Safety Guide 25) ", March 1972

15. PBAPS Drawing M-884, Sheet 2, "QAD Diagram Control Room HVAC", Rev. 2

16. GESTAR II, NEDE-24011-P-A-11-US, Refueling Accident Analysis.

17. PBAPS Design Analysis PM-1060, "Re-analysis of Loss of Coolant Accident (LOCA) Using Alternative Source Terms", Rev. 3.

6. CALCULATIONS

This calculation evaluates the radiological dose to an operator in the Control Room and a person at the EAB and LPZ locations following a design basis FHA involving irradiated fuel that has decayed for various times after shutdown. This analysis uses Alternative Source Term assumptions per guidance in Reg. Guide 1.183.

The RADTRAD v. 3.03 computer code was used for this Peach Bottom Units 2 & 3 FHA calculation. RADTRAD (Ref. 3) is a simplified model of RADionuclide Transport and Removal And Dose Estimation developed for the NRC and endorsed by the NRC as an acceptable methodology for reanalysis of the radiological consequences of design basis accidents. The technical basis for the RADTRAD code is documented in Section 2 of NUREG/CR-6604. The methodologies significant to this analysis are the dose consequence analysis (NUREG Section 2.3) and the Radioactive Decay Calculations (NUREG Section 2.4).

The RADTRAD inputs are summarized below:

A. Compartments

1. Containment – This compartment represents the Reactor Building Air Space, into which fission products leaving the spent fuel pool are released.
   a. Compartment type – Other – since it is not the environment or control room.
   b. Volume – 1.000E+02 ft^3 – This is an artificial RB volume, used to simplify the evacuation of activity from the RB to the environment. An exhaust rate was tailored to this nominal volume in order to model 6 air changes per hour, which ensures that all activity is released within the 2-hour period.
   c. Source term fraction – 1.0
   d. Compartment features – no compartment removal mechanisms selected.

2. Environment
   a. Compartment type – Environment

3. Control Room
   a. Compartment type – Environment - Control Room
   b. Volume – 176,000 ft^3 – Ventilated volume.
   c. Source term fraction – 0.0
   d. Compartment features –none selected

B. Transfer Pathways

1. Filtered Flow, Leak to the Environment
   a. From Compartment 1 – Containment
   b. To Compartment 2 – Environment
   c. Transfer mechanism – "Filter" selected
   d. Filter Efficiency Panel – Flow rate – 10 cfm – This is an arbitrary value that was set to ensure the release of 99.9999% of the activity from the Reactor Building within 2 hours, based on the nominal value as set above. This flow rate corresponds to 6 air changes per hour.
   e. Filter Efficiency Panel – FHA analyses do not credit SGTS filtration, and so the efficiency used is 0.
   f. Active Pathway – Yes

2. Environment to Control Room
   a. From Compartment 2 – Environment
   b. To Compartment 3 – Control Room
   c. Transfer mechanism – "Filter" selected
   d. Filter Efficiency Panel – All Cases except Case 6: Flow rate – 22,200 – This flowrate conservatively accounts for the normal operational flowrate of 20,600 cfm, and an additional 1600 cfm inleakage.
      Filter Efficiency Panel – Case 6: Flow rate – 2,700 cfm filtered intake and an additional 500 cfm unfiltered inleakage.
   e. Filter Efficiency Panel – All Cases except Case 6: Filter efficiency is entered as 0.0% for all chemical forms of iodine, to show that no CREF is credited.
      Filter Efficiency Panel – Case 6: Filter efficiency is entered as 99.0% for aerosol and 90.0% for both Elemental and Organic chemical forms of iodine.
   f. Active Pathway – Yes

3. Control Room to Environment
   a. From Compartment 3 – Control Room
   b. To Compartment 2 – Environment
   c. Transfer mechanism – "Filter" selected
   d. Filter Efficiency Panel – All Cases except Case 6: Flow rate – 22,200 cfm – Provides an equilibrium with flow intake.
      Filter Efficiency Panel – Case 6: Flow rate – 3,200 cfm – Provides an equilibrium with flow intake.
   e. Filter Efficiency Panel – Filter efficiency is entered as 100.0% iodine chemical for all time periods. This is the exit from the control room to the environment; the filtration prevents a double counting of the iodine release. Note that the noble gas release will still be re-circulated between the control room and the outside environment.
   f. Active Pathway – Yes

C. Dose Locations

1. Exclusion Area Boundary
   a. In Compartment 2 – Environment
   b. Breathing Rate Default – Not selected
   c. χ/Q – 4.25E-04 sec/m^3 – this is the 0-2 hr accident χ/Q for PBAPS TB/RB Ventilation Stack. This value is entered from time 24-hours to the end of the accident.
   d. Breathing Rate – 3.47E-04 m^3/sec – RADTRAD default that is the non-rounded version of the value in Reg. Guide 1.183.
2. Low Population Zone
   a. In Compartment 2 – Environment
   b. Breathing Rate Default – Not selected
   c. χ/Q – 4.81E-05 sec/m^3 – this is the 0-2 hr accident χ/Q for PBAPS TB/RB Ventilation Stack. This value is entered from time 24-hours to the end of the accident.
   d. Breathing Rate – 3.47E-04 m^3/sec.

3. Control Room
   a. In Compartment 3 – Control Room
   b. Breathing Rate - 3.47E-04 m^3/sec.
   e. χ/Q – Cases 1 and 2: 1.18E-03 sec/m^3 – this is the 0-2 hr accident χ/Q for PBAPS TB/RB Ventilation Stack. This value is entered from time 24-hours to the end of the accident.
      χ/Q – Cases 3 and 4: 1.90E-03 sec/m^3 – this is the 0-2 hr accident χ/Q for the worst-case (Unit 2) PBAPS Roof Scuttle, as derived in Attachment G. This value is entered from time 24-hours to the end of the accident.

χ/Q – Cases 5 and 6: 1.28E-02 sec/m^3 – this is the 0-2 hr accident χ/Q for the worst-case Ground Hatch, as derived in Attachment G. This value is entered from time 24-hours to the end of the accident.

c. Breathing Rate – 3.47E-04 m^3/sec
d. Occupancy Factor – 1.0 – this the Reg. Guide 1.183 value for the first day.

D. Source Term and Release Fraction Treatment
   a. The *"Peach Bottom AST Source Terms for FHA.nif"* file [Attachment C] reflects the PBAPS core activities with the I-131 value multiplied by 1.6 and the Kr-85 value multiplied by 2.0. These changes are made so that the Reg. Guide 1.183, Table 3 differentiation in release fraction can be made.
   b. The power level of 15.46 MW is per section 2.1 above and reflects the fraction of the core damaged and the radial peaking factor applied to that fuel.
   c. The delay time (24-hours for Cases 1 and 4, 0 for Case 2, 6-hours for Case 3, 468-hours for Case 5, and 84-hours for Case 6) reflects the time after shutdown that fuel movement is assumed.
   d. The file *"Peach Bottom AST FHA.rft"* [Attachment D] is designed to reflect gap activity fractions per Reg. Guide 1.183, Table 3, with the adjustment describe for the "nif" file described above.

E. Dose Conversion Factors
   The default FGR-11 and FGR-12 dose conversion factors provided with RADTRAD are used.

7. SUMMARY AND CONCLUSIONS

The RADTRAD code was used to examine the effect of the alternate source term release on offsite and CR doses. Shown below are the results, as well as the dose acceptance criteria.

Case 1: Dose Limits and Calculated Doses for TB/RB Stack Release Pathway Decay Time = 24 Hours and No CREF Operation

Location	Dose (rem TEDE)
LIMITS	CR 5.0; EAB & LPZ 6.3
EAB	1.16
LPZ	0.132
CR	2.35

These results indicated that the calculated consequences of a design basis Fuel Handling Accident at or after 24 hours of shutdown with releases through the expected TB/RB Ventilation Stack release pathway will be within regulatory limits without the requirement of an SGTS filtered and elevated release through the PBAPS Main Stack. Furthermore, Control Room emergency filtration is not required to maintain operator doses within regulatory limits.

The following Case 2 results show that even with source terms associated with Time 0 after shutdown, EAB, LPZ, and CR doses would be within the limits with neither SGTS filtration or elevated release through the main stack, with releases through the expected TB/RB Ventilation Stack release pathway.

Case 2: Dose Limits and Calculated Doses for TB/RB Stack Release Pathway with Decay Time = 0 and No CREF Operation	
Location	Dose (rem TEDE)
LIMITS	CR 5.0; EAB & LPZ 6.3
EAB	5.17
LPZ	0.585
CR	3.42

Based upon the χ/Qs in Table 4-1 in Attachment G, both of the above Cases for releases from the normal RB/TB exhaust bound the releases that could occur through the grade level personnel hatch or the railroad access door for either Unit.

The following Case 3 through 6 results assume neither SGTS filtration nor elevated release through the main stack, but with releases through various worst-case secondary containment building opening pathways based on the χ/Q values determined in Attachment G. As shown, various decay periods before fuel movement are assumed for Cases 3 through 6 to determine the post-shutdown decay periods such that secondary containment integrity and filtration previously required to mitigate the radiological consequences of fuel handling accidents may not be necessary, with no CREF in operation except for Case 6. For margin in these analyses, doses are controlled to about 4.6 rem to Control Room personnel.

Cases 3 - 6: Dose limits and Calculated Doses for Worst-Case Secondary Containment Building Opening Release Pathways

Case	Release Point	Decay Time (hours)	MCREV Credit	EAB Dose (rem TEDE) *[Limit = 6.3]*	LPZ Dose (rem TEDE) *[Limit = 6.3]*	CR Dose (rem TEDE) *[Limit = 5.0]*
3	RB Roof Scuttle	6	No	2.19	0.248	4.63
4	RB Roof Scuttle	24	No	1.16	0.132	3.85
5	Limiting Hatch ("Ground Hatch 4" in Att. G)	468 (19.5 d)	No	0.163	0.018	4.57
6	Limiting Hatch ("Ground Hatch 4" in Att. G)	84 (3.5 d)	Yes	0.714	0.081	4.56

For Cases 3 and 4, the worst cases for the RB roof scuttles as the release pathway, without secondary containment or MCREV filter credit, a minimum decay time of 6 hours would be required in order to meet regulatory limits. Movement of fuel from the reactor within 6 hours of shutdown would be impossible.

For Cases 5 and 6, developed as bounding cases where grade level hatches to the west of the Reactor/Radwaste Buildings might be opened, the limiting case is a hatch that is nearly under and slightly north of the control room intake. Case 6 shows that a minimum decay time of 84 hours and the MCREV would be required to be available in order to meet regulatory limits. MCREV serves both units and would generally be required for the operating unit in any case. Case 5 shows that this minimum decay time would have to extend to 468 hours without MCREV availability when this worst-case hatch is open.

8. OWNER'S ACCEPTANCE REVIEW CHECKLIST FOR EXTERNAL DESIGN ANALYSIS

DESIGN ANALYSIS NO. PM-1059 REV: 1

	Yes	No	N/A
1. Do assumptions have sufficient rationale?	☑	☐	☐
2. Are assumptions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
3. Do the design inputs have sufficient rationale?	☑	☐	☐
4. Are design inputs correct and reasonable?	☑	☐	☐
5. Are design inputs compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
6. Are Engineering Judgments clearly documented and justified?	☑	☐	☐
7. Are Engineering Judgments compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
8. Do the results and conclusions satisfy the purpose and objective of the design analysis?	☑	☐	☐
9. Are the results and conclusions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
10. Does the design analysis include the applicable design basis documentation?	☑	☐	☐
11. Have any limitations on the use of the results been identified and transmitted to the appropriate organizations?	☑	☐	☐
12. Are there any unverified assumptions?	☐	☑	☐
13. Do all unverified assumptions have a tracking and closure mechanism in place?	☐	☐	☑

EXELON REVIEWER: T.J. Maciszewski / J. Macisz **DATE:** 1/5/05
Print / Sign

ATTACHMENT A
Source Terms

Introduction

The following description and calculation input and results from Robert Jaffa of Exelon Nuclear derives the isotopic inventory (core source terms) to be used as inputs for the PBAPS AST Design Basis Accident analyses. The derivation uses an Exelon Nuclear controlled-version of ORIGEN 2.1, as noted. Although derived for PB Unit 3, they are considered as applicable to PB Unit 2 as well.

The core source terms are initially calculated based on a power level of 3514.9 MWt, which is approximately the Rated Thermal Power of 3514 MWt. The AST analyses utilize a Design Basis Accident (DBA) power level of 3528 MWt. RADTRAD uses a NIF file in units of Curies/MWt and multiplies this by the specified core power, so the derived Curie quantities for the 60 RADTRAD isotopes in the following Table 2 are divided by 3514.9 to create the NIF file as presented in Attachment C, and 3528 MWt is used as the input specified core power for full core power analyses.

The approach utilized produces a bounding isotopic core inventory, using the maximum quantity for each isotope of either:

- the 100 Effective Full Power Days (EFPD) calculated value (conservatively representing the Beginning of Cycle condition to ensure that all isotopes with half lives < 1 year are at equilibrium levels), or
- the calculated End of Cycle values, with full power operation at the DBA power level of 3528 MWt conservatively assumed for the entirety (i.e., with no power coastdown) of a 711 EFPD cycle containing two batches of 4.107 w/o average U235 enrichment and one batch of 4.105 w/o average U235 enrichment typical of current PBAPS cycle design.

The resulting source term provides bounding doses consistent with Regulatory Guide 1.183, Section 3.1 for the applicable range of fuel enrichments and burnups. Sensitivity analyses confirm that all Control Room (CR) and offsite doses for the assumed Loss of Coolant Accident described in AST Calculation PM-1060 Rev. 3 are bounded by this "Base Case" source term approach, compared with consideration of the following alternative Cases:

Case A = Base Case except for 5.0% Enrichment with utilization of the maximum calculated Curies for each isotope of either the 100 EFPD or EOC values
Case B = Base Case except with 5.0% Enrichment and artificially bounding full-power cycle length of 740 EFPD with utilization of the maximum calculated Curies for each isotope of either the 100 EFPD or EOC values
Case C = Base Case except with 4.107% Enrichment and artificially bounding full-power cycle length of 740 EFPD, but with utilization of only the EOC values of Curies for each isotope
Case D = Base Case except with a one-year "short cycle" of 3.56% Enrichment and full-power cycle length of 351 EFPD with utilization of the maximum calculated Curies for each isotope of either the 100 EFPD or EOC values. This is a test to show the effects of lower enrichments and shorter operating cycles within practical economic values.
Case E = Base Case except with 5.0% Enrichment and full-power cycle length of 711 EFPD, but with utilization of only the EOC values of Curies for each isotope
Case F = Base Case except with 4.107% Enrichment and full-power cycle length of 711 EFPD, but with utilization of only the 100 EFPD values of Curies for each isotope
Case G = Base Case except with 4.107% Enrichment and full-power cycle length of 711 EFPD, but with utilization of only the EOC values of Curies for each isotope.

1.0 PURPOSE

To calculate the isotopic core inventory for PB Unit 3 using the ORIGEN2.1 code based on reactor operation at 3514.9 MWt and an equilibrium 711 EFPD two-year cycle design.

2.0 SUMMARY OF RESULTS

The bounding isotopic core inventory for a 711 EFPD two-year cycle design at PB Unit 3 is shown in terms of activity (Curies) and concentration (grams) in Tables 2 and 4, respectively. This bounding isotopic core inventory was determined for PB Unit 3's expected power uprate power level of 3514.9 MWt, which is approximately equal to the rated thermal power of 3514 MWt.

3.0 REFERENCES

3.1 RSIC Code Package CCC-371, "ORIGEN 2.1, Isotope Generation and Depletion Code Matrix Exponential Method," May 1999.

3.2 Exelon Nuclear memo NFM-MA:03-002 from J. Wolfrom to R. Jaffa, Re: "Peach Bottom Alternate Source Term Information," dated January 9, 2003.

3.3 Memo from R. Jaffa to R. Tropasso, Re: "Installation Verification of ORIGEN2.1 on the IBM PC Platform," dated July 7, 2000.

3.4 ORNL/TM-11018, "Standard- and Extended-Burnup PWR and BWR Reactor Models for the ORIGEN2 Computer Code," S. Ludwig, J. Renier, December 1989.

4.0 ASSUMPTIONS

4.1 The ORIGEN2.1 code [Ref 3.1] was used to calculate isotopic activities based on the cycle design described in Reference 3.2. The ORIGEN2.1 code was run on an IBM-PC and was confirmed to be controlled per Ref. 3.3.

4.2 Batch-average enrichments and exposures from Ref. 3.2 were used to develop input to ORIGEN2.1. This is equivalent to performing individual calculations for each sub-batch.

4.3 For fuel burned in more than one cycle, ORIGEN2.1 runs ignored refueling outages. This has no impact on short-lived isotopes which reach equilibrium concentrations shortly after cycle startup and has a conservative, albeit minimal, impact on long-lived isotopes which continually increase in concentration as a function of exposure; ignoring intermediate decay periods will increase the final concentrations.

4.4 For isotopic activities calculated at BOC, BOC is defined as 100 days into the cycle to ensure that all short-lived isotopes (half lives < 1 year) are at equilibrium levels.

5.0 DESIGN INPUT

5.1 Batch-average information for an equilibrium two-year cycle (Ref. 3.2) was obtained using the FCYCLE01 code starting from the PB3 Cycle 14 design.

5.2 The ORIGEN2.1 cross-section library, BWRUE.LIB, is used in this calculation as this is most representative of current PB3 two-year cycles. The library is based on an "extended cycle" reactor model where fuel achieves 40 GWd/mtU burnup in four cycles.

5.3 Equilibrium cycle lengths are 711 EFPD.

5.4 The power level used for determining exposure data for the equilibrium two-year cycle is 3514.9 MWt, which is approximately the Rated Thermal Power level for PB3 of 3514 MWt after the 1.62% Caldon power uprate.

6.0 OVERALL APPROACH AND METHODOLOGY

The isotopic core inventory is a function of the reactor power level and the exposure of the fuel. The PB Unit 3 isotopic core inventory is calculated using the ORIGEN2.1 code [Ref. 3.1]. A 3514.9 MWt 711 EFPD two-year equilibrium cycle design [from Ref. 3.2] is used as the basis for this calculation

6.1 Computer Code Information

The batch file used to execute ORIGEN2.1 (DTSQA Product ID# EX0004724) for this calculation provide the paths and filenames of the executable program and libraries that were called. The batch file used is **pb3_ast.bat**. The PC-based ORIGEN2.1 code used in this calculation was verified to be controlled by comparing the time/date/size stamp of the executable file to that documented in Ref. 3.3.

```
Volume in drive D is PER30290
Volume Serial Number is 11F7-0C1F
Directory of D:\Origen21\CODE

ORIGEN2  EXE    1,267,348  06-10-96  1:09p ORIGEN2.EXE
```

The time/date/size stamps of the library files used in this calculation were verified against those documented in Ref. 3.4.

```
Volume in drive D is PER30290
Volume Serial Number is 11F7-0C1F
Directory of D:\Origen21\LIBS

BWRUE   LIB        173,676        08-01-91  2:10a
DECAY   LIB        278,636        08-01-91  2:10a
GXUO2BRM LIB       167,526        08-01-91  2:10a
```

7.0 CALCULATION

Equilibrium Two-Year Cycle Isotopic Core Inventory

An equilibrium two-year cycle design for Peach Bottom Unit 3 based on the FCYCLE01 code using the actual Cycle 14 design as a reference cycle and a cycle length of 711 EFPD is used as the basis for the source term calculation. In addition, batch average burnups were increased to account for a 1.62% Caldon power uprate. The resulting batch-average burnups for once-burned, twice-burned and thrice-burned fuel batches are shown below.

Batch	# of FA	Avg. Enr. (w/o U235)	Avg. Burnup per Cycle (MWd/mtU)	Power (MW)	Loading (MTU)	U235 wt. (gms)	U238 wt. (gms)	Oxygen wt. (gms)
1	208	4.105	22800.49 18256.15 12116.92	1197.0 958.4 636.1	37.3256	1,532,215.88	35,793,384.12	5,018,379.87
2	280	4.107	22800.49 18256.15	1611.5 1290.3	50.2516	2,063,833.21	48,187,766.79	6,756,264.28
3	276	4.107	22800.49	1588.5	49.53372	2,034,349.88	47,499,370.12	6,659,746.22

The equilibrium cycle isotopic core inventory is calculated using ORIGEN2.1 and the BWR extended burnup cross-section library BWRUE . The input deck is **pb3_ast.inp** and the batch file is **pb3_ast.bat**.

The specific power for a batch in a given cycle is determined by multiplying the batch average burnup for that cycle by the batch loading and then dividing by the number of EFPD in the cycle. For example, the specific power for Batch 1 in its first cycle of operation is:

$$(22{,}800.49 * 37.3256) / 711 = 1197.0 \text{ MW}.$$

The grams of U235 and U238 for each batch were determined by the following formulas:

$$\text{U235 (gms)} = \text{Batch loading} * (\text{Avg. Enr.}/100) * 10^6$$

$$\text{U238 (gms)} = \text{Batch loading} * (1 - \text{Avg. Enr.}/100) * 10^6$$

The corresponding weight of oxygen in UO_2 pellets for each batch is:

$$\text{O (gms)} = \text{Total batch U weight (gm U)} / 238 \text{ (gm U/gm atom U)} * 2 \text{ (gm atom O/gm atom U)} * 15.9994 \text{ gm O/gm atom O}$$

The ORIGEN2.1 input deck is set up to deplete each fuel batch and write the 100 EFPD and EOC results to temporary storage vectors. Once all batches have been depleted, the results from the temporary vectors are combined to give the results for the entire core. The ORIGEN2.1 core inventory activity and composition results for the equilibrium two-year cycle at 100 EFPD (BOC) and EOC are shown below in

Tables 1 and 3, respectively. The maximum of the 100 EFPD and EOC values for each isotope are selected to generate the bounding isotopic core inventory activity and composition results as shown in Tables 2 and 4, respectively.

Table 1
ORIGEN2.1 Isotopic Activity Results for
Peach Bottom Unit 3

Isotope	100 EFPD (Ci)	EOC (Ci)
KR 83M	1.324E+07	1.158E+07
BR 84	2.373E+07	2.002E+07
BR 85	2.888E+07	2.404E+07
KR 85	8.806E+05	1.387E+06
KR 85M	2.922E+07	2.436E+07
RB 86	1.118E+05	2.291E+05
KR 87	5.739E+07	4.672E+07
KR 88	8.096E+07	6.570E+07
RB 88	8.197E+07	6.678E+07
SR 89	9.836E+07	8.846E+07
SR 90	6.982E+06	1.117E+07
Y 90	7.142E+06	1.150E+07
SR 91	1.336E+08	1.110E+08
Y 91	1.212E+08	1.143E+08
SR 92	1.412E+08	1.205E+08
Y 92	1.416E+08	1.210E+08
Y 93	1.591E+08	1.404E+08
ZR 95	1.521E+08	1.578E+08
NB 95	1.399E+08	1.586E+08
ZR 97	1.637E+08	1.578E+08
MO 99	1.771E+08	1.785E+08
TC 99M	1.551E+08	1.563E+08
RU103	1.234E+08	1.477E+08
RU105	7.642E+07	1.022E+08
RH105	7.310E+07	9.673E+07
RU106	3.856E+07	6.081E+07
SB127	8.572E+06	1.018E+07
TE127	8.402E+06	1.010E+07
TE127M	1.039E+06	1.355E+06
SB129	2.732E+07	3.036E+07
TE129	2.679E+07	2.988E+07
TE129M	3.875E+06	4.453E+06
I129	2.774E+00	4.816E+00
TE131M	1.269E+07	1.360E+07
I131	9.139E+07	9.444E+07

Isotope	100 EFPD (Ci)	EOC (Ci)
XE131M	1.015E+06	1.056E+06
TE132	1.322E+08	1.343E+08
I132	1.338E+08	1.364E+08
I133	1.953E+08	1.925E+08
XE133	1.904E+08	1.930E+08
XE133M	5.956E+06	6.007E+06
I134	2.167E+08	2.118E+08
CS134	1.335E+07	2.559E+07
I135	1.825E+08	1.806E+08
XE135	7.832E+07	7.086E+07
XE135M	3.636E+07	3.773E+07
CS136	3.568E+06	7.123E+06
CS137	9.460E+06	1.595E+07
BA137M	8.965E+06	1.510E+07
XE138	1.679E+08	1.589E+08
CS138	1.841E+08	1.760E+08
BA139	1.787E+08	1.719E+08
BA140	1.721E+08	1.661E+08
LA140	1.764E+08	1.722E+08
LA141	1.631E+08	1.563E+08
CE141	1.579E+08	1.575E+08
LA142	1.593E+08	1.510E+08
CE143	1.556E+08	1.449E+08
PR143	1.509E+08	1.416E+08
CE144	1.012E+08	1.264E+08
ND147	6.459E+07	6.321E+07
NP239	1.616E+09	1.897E+09
PU238	2.639E+05	6.312E+05
PU239	3.100E+04	4.218E+04
PU240	2.871E+04	4.526E+04
PU241	1.365E+07	2.173E+07
AM241	1.634E+04	3.349E+04
CM242	3.645E+06	8.393E+06
CM244	2.654E+05	9.147E+05

Table 2
Bounding Isotopic Core Inventory
Peach Bottom Unit 3

Isotope	Isotopic Activity (Ci)
KR 83M	1.324E+07
BR 84	2.373E+07
BR 85	2.888E+07
KR 85	1.387E+06
KR 85M	2.922E+07
RB 86	2.291E+05
KR 87	5.739E+07
KR 88	8.096E+07
RB 88	8.197E+07
SR 89	9.836E+07
SR 90	1.117E+07
Y 90	1.150E+07
SR 91	1.336E+08
Y 91	1.212E+08
SR 92	1.412E+08
Y 92	1.416E+08
Y 93	1.591E+08
ZR 95	1.578E+08
NB 95	1.586E+08
ZR 97	1.637E+08
MO 99	1.785E+08
TC 99M	1.563E+08
RU103	1.477E+08
RU105	1.022E+08
RH105	9.673E+07
RU106	6.081E+07
SB127	1.018E+07
TE127	1.010E+07
TE127M	1.355E+06
SB129	3.036E+07
TE129	2.988E+07
TE129M	4.453E+06
I129	4.816E+00
TE131M	1.360E+07
I131	9.444E+07

Isotope	Isotopic Activity (Ci)
XE131M	1.056E+06
TE132	1.343E+08
I132	1.364E+08
I133	1.953E+08
XE133	1.930E+08
XE133M	6.007E+06
I134	2.167E+08
CS134	2.559E+07
I135	1.825E+08
XE135	7.832E+07
XE135M	3.773E+07
CS136	7.123E+06
CS137	1.595E+07
BA137M	1.510E+07
XE138	1.679E+08
CS138	1.841E+08
BA139	1.787E+08
BA140	1.721E+08
LA140	1.764E+08
LA141	1.631E+08
CE141	1.579E+08
LA142	1.593E+08
CE143	1.556E+08
PR143	1.509E+08
CE144	1.264E+08
ND147	6.459E+07
NP239	1.897E+09
PU238	6.312E+05
PU239	4.218E+04
PU240	4.526E+04
PU241	2.173E+07
AM241	3.349E+04
CM242	8.393E+06
CM244	9.147E+05

Table 3
ORIGEN2.1 Isotopic Concentration Results for
Peach Bottom Unit 3

Isotope	100 EFPD (grams)	EOC (grams)
KR 83M	6.414E-01	5.611E-01
BR 84	3.370E-01	2.843E-01
BR 85	3.741E-02	3.114E-02
KR 85	2.244E+03	3.534E+03
KR 85M	3.550E+00	2.959E+00
RB 86	1.373E+00	2.814E+00
KR 87	2.025E+00	1.649E+00
KR 88	6.451E+00	5.235E+00
RB 88	6.826E-01	5.561E-01
SR 89	3.384E+03	3.044E+03
SR 90	5.116E+04	8.183E+04
Y 90	1.312E+01	2.113E+01
SR 91	3.683E+01	3.060E+01
Y 91	4.939E+03	4.658E+03
SR 92	1.123E+01	9.579E+00
Y 92	1.471E+01	1.256E+01
Y 93	4.768E+01	4.206E+01
ZR 95	7.079E+03	7.341E+03
NB 95	3.576E+03	4.054E+03
ZR 97	8.560E+01	8.251E+01
MO 99	3.691E+02	3.720E+02
TC 99M	2.947E+01	2.971E+01
RU103	3.822E+03	4.575E+03
RU105	1.136E+01	1.519E+01
RH105	8.657E+01	1.146E+02
RU106	1.152E+04	1.817E+04
SB127	3.208E+01	3.811E+01
TE127	3.182E+00	3.826E+00
TE127M	1.101E+02	1.436E+02
I127	4.533E+03	8.040E+03
SB129	4.856E+00	5.397E+00
TE129	1.279E+00	1.426E+00
TE129M	1.286E+02	1.478E+02
I129	1.571E+04	2.727E+04
TE131M	1.591E+01	1.704E+01
I131	7.369E+02	7.615E+02

Isotope	100 EFPD (grams)	EOC (grams)
XE131M	1.212E+01	1.260E+01
TE132	4.352E+02	4.423E+02
I132	1.296E+01	1.321E+01
I133	1.723E+02	1.699E+02
XE133	1.017E+03	1.031E+03
XE133M	1.328E+01	1.339E+01
CS133	1.025E+05	1.678E+05
I134	8.118E+00	7.936E+00
CS134	1.031E+04	1.977E+04
I135	5.195E+01	5.140E+01
XE135	3.065E+01	2.773E+01
XE135M	3.990E-01	4.140E-01
CS135	4.502E+04	7.841E+04
CS136	4.867E+01	9.715E+01
CS137	1.087E+05	1.832E+05
BA137M	1.666E-02	2.807E-02
XE138	1.745E+00	1.652E+00
CS138	4.348E+00	4.156E+00
BA139	1.092E+01	1.051E+01
BA140	2.359E+03	2.277E+03
LA140	3.168E+02	3.093E+02
LA141	2.883E+01	2.762E+01
CE141	5.541E+03	5.528E+03
LA142	1.115E+01	1.056E+01
CE143	2.342E+02	2.181E+02
PR143	2.241E+03	2.102E+03
CE144	3.172E+04	3.962E+04
ND147	8.039E+02	7.867E+02
NP239	6.963E+03	8.173E+03
PU238	1.541E+04	3.685E+04
PU239	4.985E+05	6.782E+05
PU240	1.259E+05	1.986E+05
PU241	1.324E+05	2.108E+05
AM241	4.759E+03	9.755E+03
CM242	1.102E+03	2.537E+03
CM244	3.279E+03	1.130E+04

Table 4
Bounding Isotopic Core Inventory
Peach Bottom Unit 3

Isotope	Isotopic Concentration (grams)
KR 83M	6.414E-01
BR 84	3.370E-01
BR 85	3.741E-02
KR 85	3.534E+03
KR 85M	3.550E+00
RB 86	2.814E+00
KR 87	2.025E+00
KR 88	6.451E+00
RB 88	6.826E-01
SR 89	3.384E+03
SR 90	8.183E+04
Y 90	2.113E+01
SR 91	3.683E+01
Y 91	4.939E+03
SR 92	1.123E+01
Y 92	1.471E+01
Y 93	4.768E+01
ZR 95	7.341E+03
NB 95	4.054E+03
ZR 97	8.560E+01
MO 99	3.720E+02
TC 99M	2.971E+01
RU103	4.575E+03
RU105	1.519E+01
RH105	1.146E+02
RU106	1.817E+04
SB127	3.811E+01
TE127	3.826E+00
TE127M	1.436E+02
I127	8.040E+03
SB129	5.397E+00
TE129	1.426E+00
TE129M	1.478E+02
I129	2.727E+04
TE131M	1.704E+01
I131	7.615E+02

Isotope	Isotopic Concentration (grams)
XE131M	1.260E+01
TE132	4.423E+02
I132	1.321E+01
I133	1.723E+02
XE133	1.031E+03
XE133M	1.339E+01
CS133	1.678E+05
I134	8.118E+00
CS134	1.977E+04
I135	5.195E+01
XE135	3.065E+01
XE135M	4.140E-01
CS135	7.841E+04
CS136	9.715E+01
CS137	1.832E+05
BA137M	2.807E-02
XE138	1.745E+00
CS138	4.348E+00
BA139	1.092E+01
BA140	2.359E+03
LA140	3.168E+02
LA141	2.883E+01
CE141	5.541E+03
LA142	1.115E+01
CE143	2.342E+02
PR143	2.241E+03
CE144	3.962E+04
ND147	8.039E+02
NP239	8.173E+03
PU238	3.685E+04
PU239	6.782E+05
PU240	1.986E+05
PU241	2.108E+05
AM241	9.755E+03
CM242	2.537E+03
CM244	1.130E+04

Input Deck pb3_ast.inp

```
-1
-1
-1
BAS     Grams of Heavy Metal per Fuel Batch
RDA     PLACE FUEL into vectors -1, -2 and -3
LIP     0  0  0
LIB     0  1  2  3   657   658   659  9  3  0  1 42
PHO     0 0 0 10
RDA     READ FUEL COMPOSITION FOR BATCH 3
INP     -1  1  -1 -1  1  1
RDA     READ FUEL COMPOSITION FOR BATCH 2
INP     -2  1  -1 -1  1  1
RDA     READ FUEL COMPOSITION FOR BATCH 1
INP     -3  1  -1 -1  1  1
RDA TIT     IRRADIATION OF TMI-1 CYCLE 1 FULL CORE
MOV     -3  1  0  1.0       BATCH 1 FRESH
HED     1    CHARGE
RDA     BATCH 1 BURNUP IN CYCLE 1
BUP
IRP     50.0   1197.0    1   9   4 2
IRP    100.0   1197.0    9   2   4 0
IRP    150.0   1197.0    2   9   4 0
IRP    200.0   1197.0    9   3   4 0
IRP    250.0   1197.0    3   9   4 0
IRP    300.0   1197.0    9   4   4 0
IRP    350.0   1197.0    4   9   4 0
IRP    400.0   1197.0    9   5   4 0
IRP    450.0   1197.0    5   9   4 0
IRP    500.0   1197.0    9   6   4 0
IRP    550.0   1197.0    6   9   4 0
IRP    600.0   1197.0    9   7   4 0
IRP    650.0   1197.0    7   9   4 0
IRP    711.0   1197.0    9   8   4 0
BUP
OPTL    4*8 5 8 5 17*8
OPTA    4*8 5 8 5 17*8
OPTF    4*8 5 8 5 17*8
OUT     -8  1  -1  0
MOV      8  1  0  1.0       BATCH 1 ONCE BURNED
HED     1    CHARGE
RDA     BATCH 1 BURNUP IN CYCLE 2
BUP
IRP    761.0    958.4    1   9   4 3
IRP    811.0    958.4    9   2   4 0
IRP    861.0    958.4    2   9   4 0
IRP    911.0    958.4    9   3   4 0
IRP    961.0    958.4    3   9   4 0
IRP   1011.0    958.4    9   4   4 0
IRP   1061.0    958.4    4   9   4 0
IRP   1111.0    958.4    9   5   4 0
IRP   1161.0    958.4    5   9   4 0
IRP   1211.0    958.4    9   6   4 0
IRP   1261.0    958.4    6   9   4 0
IRP   1311.0    958.4    9   7   4 0
IRP   1361.0    958.4    7   9   4 0
```

```
IRP   1422.0    958.4    9   8   4 0
BUP
OUT     -8  1  -1  0
MOV      8  1  0  1.0       BATCH 1 TWICE BURNED
HED     1    CHARGE
RDA     BATCH 1 BURNUP IN CYCLE 3
BUP
IRP   1472.0    636.1    1   9   4 3
IRP   1522.0    636.1    9   2   4 0
IRP   1572.0    636.1    2   9   4 0
IRP   1622.0    636.1    9   3   4 0
IRP   1672.0    636.1    3   9   4 0
IRP   1722.0    636.1    9   4   4 0
IRP   1772.0    636.1    4   9   4 0
IRP   1822.0    636.1    9   5   4 0
IRP   1872.0    636.1    5   9   4 0
IRP   1922.0    636.1    9   6   4 0
IRP   1972.0    636.1    6   9   4 0
IRP   2022.0    636.1    9   7   4 0
IRP   2072.0    636.1    7   9   4 0
IRP   2133.0    636.1    9   8   4 0
BUP
OUT     -8  1  -1  0
MOV      2 -9   0  1.0       BATCH 1 100 EFPD PLACED IN TEMP VECTOR -9
MOV      8 -10  0  1.0       BATCH 1 EOC3 PLACED IN TEMP VECTOR -10
RDA     BATCH 2 BURNUP IN CYCLE 2
MOV     -2  1  0  1.0       BATCH 2 FRESH
HED     1    CHARGE
RDA     BATCH 2 BURNUP IN CYCLE 2
BUP
IRP     50.0   1611.5    1   9   4 2
IRP    100.0   1611.5    9   2   4 0
IRP    150.0   1611.5    2   9   4 0
IRP    200.0   1611.5    9   3   4 0
IRP    250.0   1611.5    3   9   4 0
IRP    300.0   1611.5    9   4   4 0
IRP    350.0   1611.5    4   9   4 0
IRP    400.0   1611.5    9   5   4 0
IRP    450.0   1611.5    5   9   4 0
IRP    500.0   1611.5    9   6   4 0
IRP    550.0   1611.5    6   9   4 0
IRP    600.0   1611.5    9   7   4 0
IRP    650.0   1611.5    7   9   4 0
IRP    711.0   1611.5    9   8   4 0
BUP
OUT     -8  1  -1  0
MOV      8  1  0  1.0       BATCH 2 ONCE BURNED
HED     1    CHARGE
RDA     BATCH 2  BURNUP IN CYCLE 3
BUP
IRP    761.0   1290.3    1   9   4 3
IRP    811.0   1290.3    9   2   4 0
IRP    861.0   1290.3    2   9   4 0
IRP    911.0   1290.3    9   3   4 0
IRP    961.0   1290.3    3   9   4 0
IRP   1011.0   1290.3    9   4   4 0
IRP   1061.0   1290.3    4   9   4 0
```

```
IRP   1111.0   1290.3    9   5   4 0
IRP   1161.0   1290.3    5   9   4 0
IRP   1211.0   1290.3    9   6   4 0
IRP   1261.0   1290.3    6   9   4 0
IRP   1311.0   1290.3    9   7   4 0
IRP   1361.0   1290.3    7   9   4 0
IRP   1422.0   1290.3    9   8   4 0
BUP
OUT     -8  1  -1  0
ADD     2 -9   0  1.0       BATCH 2 100 EFPD ADDED TO TEMP VECTOR -9
ADD     8 -10  0  1.0       BATCH 2 EOC3 ADDED TO TEMP VECTOR -10
MOV     -1  1  0  1.0       BATCH 3 FRESH
HED     1    CHARGE
RDA     BATCH 3  BURNUP IN CYCLE 3
BUP
IRP     50.0   1588.5    1   9   4 2
IRP    100.0   1588.5    9   2   4 0
IRP    150.0   1588.5    2   9   4 0
IRP    200.0   1588.5    9   3   4 0
IRP    250.0   1588.5    3   9   4 0
IRP    300.0   1588.5    9   4   4 0
IRP    350.0   1588.5    4   9   4 0
IRP    400.0   1588.5    9   5   4 0
IRP    450.0   1588.5    5   9   4 0
IRP    500.0   1588.5    9   6   4 0
IRP    550.0   1588.5    6   9   4 0
IRP    600.0   1588.5    9   7   4 0
IRP    650.0   1588.5    7   9   4 0
IRP    711.0   1588.5    9   8   4 0
BUP
OUT     -8  1  -1  0
ADD      2 -9   0  1.0
ADD      8 -10  0  1.0
MOV     -9  1  0  1.0       CYCLE 3 @ 100 EFPD
MOV    -10  2  0  1.0       CYCLE 3 @ EOC
HED      1     100 EFPD
HED      2     EOC
OUT     -2  1  -1  0
END
2  922350  2034349.88   922380  47499370.12       0   0.0                UO2
4  080000  6659746.22        0       0.0                                 UO2
0
2  922350  2063833.21   922380  48187766.79       0   0.0                UO2
4  080000  6756264.28        0       0.0                                 UO2
0
2  922350  1532215.88   922380  35793384.12       0   0.0                UO2
4  080000  5018379.87        0       0.0                                 UO2
0
END
```

Job Batch File pb3_ast.bat

```
echo off
echo ************************************************************************
echo ************************************************************************
echo **                                                                    **
echo **                              O R I G E N 2                         **
echo **            Oak Ridge Isotope GENeration and Depletion Code         **
echo **                            Version 2.1 (8-1-91)                    **
echo **                                                                    **
echo ************************************************************************
echo **                                                                    **
echo **   Developed by:  Oak Ridge National Laboratory                     **
echo **                  Chemical Technology Division                      **
echo **                                                                    **
echo **   Technical Contact:  Scott B. Ludwig                              **
echo **                       (615) 574-7916   FTS 624-7916                **
echo **                                                                    **
echo **   Distributed by:  Radiation Shielding Information Center (RSIC)   **
echo **                    Oak Ridge National Laboratory                   **
echo **                    P.O. Box 2008                                   **
echo **                    Oak Ridge, TN  37831                            **
echo **                    (615) 574-6176   FTS 624-6176                  **
echo ************************************************************************
echo ************************************************************************
pause
echo ** Execution continuing ...                                           **
echo ************************************************************************
echo ************************************************************************
echo **                                                                    **
echo **    Version 2.1 (8-1-91) for mainframes and 80386 or 80486 PCs      **
echo **                                                                    **
copy pb3_ast.inp tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy samp_2.u3 tape3.inp >nul
copy \origen21\libs\decay.lib+\origen21\libs\bwrue.lib tape9.inp >nul
copy \origen21\libs\gxuo2brm.lib tape10.inp >nul
\origen21\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out pb3_ast.u6 >nul
copy tape13.out+tape11.out pb3_ast.u11 >nul
ren tape7.out pb3_ast.pch
ren tape15.out pb3_ast.dbg
ren tape16.out pb3_ast.vxs
ren tape50.out pb3_ast.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ****************** O R I G E N 2 - Version 2.1 ************************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/14/2003  at 17:58:51
#######################################################################

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

 Plant file           = P:\Users\Nuc\Exelon EOC\Discipline
Files\Process\AST\Peach Bottom AST\Pbaps FHA\RADTRAD\PBAPS FHA 24hr Delay - No
Filter Credit-22000.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3-03\defaults\fgr11&12.inp


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


 Radtrad 3.03 4/15/2001
 PBAPS FHA - TB/RB Ventilation Stack to CR Intake, EAB, & LPZ - 24 Hour Delay
and No Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
```

```
  0
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3-03\defaults\fgr11&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  2.4000E+01
  1
  9.5000E-01   4.7500E-02   2.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  1
  1
  0
  0
  0
  0
  0
  0
```

```
  0
Compartment 2:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  2.4000E+01   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  2.4000E+01   2.2200E+04   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   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
  2
  2.4000E+01   2.2200E+04   1.0000E+02   1.0000E+02   1.0000E+02
  4.8000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  2.4000E+01   4.2500E-04
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  2.4000E+01   4.8100E-05
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  0
Location 3:
Control Room
  3
  0
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   1.0000E+00
  4.8000E+01   0.0000E+00
Effective Volume Location:
  1
  2
  2.4000E+01   1.1800E-03
  4.8000E+01   0.0000E+00
Simulation Parameters:
  5
  2.4000E+01   1.0000E-03
  2.4010E+01   1.0000E-02
```

```
  2.4100E+01   1.0000E-01
  2.5000E+01   1.0000E+00
  4.8000E+01   0.0000E+00
 Output Filename:
 P:\Users\Nuc\Exelon EOC\Discipline Files\Process\AST\Peach Bottom AST\Pbaps
FHA\RADTRAD\PBAPS FHA 24hr Delay - No Filter Credit-22000.o0
  1
  1
  1
  0
  0
 End of Scenario File
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/14/2003  at 17:58:51
#######################################################################

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

Number of Nuclides =  60

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   1.5460E+01 MWth

Number of compartments    =   3

Compartment information

Compartment number  1  (Source term fraction =   1.0000E+00
)
Name: Containment
Compartment volume =   1.0000E+02 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: Leak to Environment

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Leak to Environment
   Inlet Pathway Number   3: Control Room to  Environment Exhaust
   Exit Pathway Number    2: Environment to  Control Room

Compartment number  3
Name: Control Room
Compartment volume =   1.7600E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environment to  Control Room
   Exit Pathway Number    3: Control Room to  Environment Exhaust

Total number of pathways =   3
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/14/2003  at 17:58:51
#######################################################################

#######################################################################
                        Scenario Description
#######################################################################
```

Time between shutdown and first release = 2.4000E+01 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.000001 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	5.0000E-02	0.0000E+00	0.0000E+00	1.791E+00
IODINE	2.5000E-04	0.0000E+00	0.0000E+00	1.610E-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 = 15. MWt

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Kr-85	1	7.892E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	8.313E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.633E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	2.303E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
I-131	2	4.299E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.881E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.556E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.165E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.192E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.491E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	2.228E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00

Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00
Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Iodine fractions

Aerosol	=	9.5000E-01
Elemental	=	4.7500E-02
Organic	=	2.5000E-03

COMPARTMENT DATA

Compartment number 1: Containment

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Leak to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
2.4000E+01	1.0000E+01	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: Environment to Control Room

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
2.4000E+01	2.2200E+04	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

```
Pathway number  3: Control Room to  Environment Exhaust

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)         Aerosol     Elemental    Organic
       2.4000E+01    2.2200E+04   1.0000E+02   1.0000E+02   1.0000E+02
       4.8000E+01    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

LOCATION DATA
     Location Exclusion Area Bndry     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       2.4000E+01          4.2500E-04
       4.8000E+01          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       2.4000E+01                 3.4700E-04
       4.8000E+01                 0.0000E+00
     Location Low Population Zone     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       2.4000E+01          4.8100E-05
       4.8000E+01          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       2.4000E+01                 3.4700E-04
       4.8000E+01                 0.0000E+00
     Location Control Room     is in compartment   3

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       2.4000E+01          1.1800E-03
       4.8000E+01          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       2.4000E+01                 3.4700E-04
       4.8000E+01                 0.0000E+00

     Location Occupancy Factor Data
      Time (hr)         Occupancy Factor
       2.4000E+01           1.0000E+00
       4.8000E+01           0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
     Time            Time step
      0.0000E+00       1.0000E-03
      1.0000E-02       1.0000E-02
      1.0000E-01       1.0000E-01
      1.0000E+00       1.0000E+00
      2.4000E+01       0.0000E+00
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/14/2003  at 17:58:51
#######################################################################
```

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

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

Exclusion Area Bndry Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.9171E-07	8.1471E-05	3.5001E-06
Accumulated dose (rem)	9.9171E-07	8.1471E-05	3.5001E-06

Low Population Zone Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1224E-07	9.2206E-06	3.9613E-07
Accumulated dose (rem)	1.1224E-07	9.2206E-06	3.9613E-07

Control Room Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.2663E-13	8.5596E-10	2.6881E-11
Accumulated dose (rem)	5.2663E-13	8.5596E-10	2.6881E-11

Containment Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-85	6.1000E+02	1.5548E-03	1.1016E+22	8.1252E+10
Kr-85m	1.5677E+02	1.9050E-08	1.3497E+17	2.0882E+10
Kr-87	2.6294E-02	9.2829E-13	6.4256E+12	3.5024E+06
Kr-88	5.0881E+01	4.0578E-09	2.7769E+16	6.7774E+09
I-131	1.5317E+02	1.2355E-06	5.6796E+18	2.0402E+10
I-132	1.2455E+02	1.2066E-08	5.5048E+16	1.6590E+10
I-133	9.6509E+01	8.5194E-08	3.8575E+17	1.2855E+10
I-135	1.6199E+01	4.6126E-09	2.0576E+16	2.1577E+09
Xe-133	4.0711E+04	2.1749E-04	9.8480E+20	5.4227E+12
Xe-135	1.0030E+04	3.9276E-06	1.7520E+19	1.3360E+12

Containment Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump
Noble gases (atoms)	1.2018E+22	0.0000E+00
Elemental I (atoms)	2.9169E+17	0.0000E+00
Organic I (atoms)	1.5352E+16	0.0000E+00

```
Aerosols (kg)           1.2705E-06  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          6.0191E-05
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    6.5263E-05
Total I (Ci)                                    3.9042E+02

Leak to Environment Transport Group Inventory:

                         Pathway
Time (h) =  24.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.6054E+16
Elemental I (atoms)    0.0000E+00  8.7508E+11
Organic I (atoms)      0.0000E+00  4.6057E+10
Aerosols (kg)          0.0000E+00  3.8115E-12

Environment Integral Nuclide Release:

Time (h) =  24.0000       Ci           kg          Atoms          Bq
Kr-85                  1.8300E-03  4.6644E-09  3.3047E+16  6.7711E+07
Kr-85m                 4.7032E-04  5.7151E-14  4.0491E+11  1.7402E+07
Kr-87                  7.8883E-08  2.7849E-18  1.9277E+07  2.9187E+03
Kr-88                  1.5264E-04  1.2173E-14  8.3306E+10  5.6478E+06
I-131                  4.5950E-04  3.7064E-12  1.7039E+13  1.7002E+07
I-132                  3.7364E-04  3.6198E-14  1.6514E+11  1.3825E+07
I-133                  2.8953E-04  2.5558E-13  1.1573E+12  1.0713E+07
I-135                  4.8597E-05  1.3838E-14  6.1729E+10  1.7981E+06
Xe-133                 1.2213E-01  6.5248E-10  2.9544E+15  4.5189E+09
Xe-135                 3.0090E-02  1.1783E-11  5.2561E+13  1.1133E+09

Environment Transport Group Inventory:

                         Total      Release
Time (h) =  24.0000     Release     Rate/s
Noble gases (atoms)    3.6054E+16  1.0015E+19
Elemental I (atoms)    8.7508E+11  2.4308E+14
Organic I (atoms)      4.6057E+10  1.2794E+13
Aerosols (kg)          3.8115E-12  1.0587E-09
Dose Effective (Ci) I-131 (Thyroid)             5.1133E-04
Dose Effective (Ci) I-131 (ICRP2 Thyroid)       5.5441E-04
Total I  (Ci)                                   1.1713E-03

Leak to Environment Transport Group Inventory:

                         Pathway
Time (h) =  24.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.6054E+16
Elemental I (atoms)    0.0000E+00  8.7508E+11
Organic I (atoms)      0.0000E+00  4.6057E+10
Aerosols (kg)          0.0000E+00  3.8115E-12

Environment to  Control Room Transport Group Inventory:

                         Pathway
Time (h) =  24.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  4.4574E+14
Elemental I (atoms)    0.0000E+00  1.0819E+10
Organic I (atoms)      0.0000E+00  5.6941E+08
Aerosols (kg)          0.0000E+00  4.7122E-14

Control Room to  Environment Exhaust Transport Group Inventory:
```

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1245E+09	0.0000E+00
Elemental I (atoms)	2.7293E+04	0.0000E+00
Organic I (atoms)	1.4365E+03	0.0000E+00
Aerosols (kg)	1.1887E-19	0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-85	2.2625E-05	5.7667E-11	4.0856E+14	3.0136E+03
Kr-85m	5.8147E-06	7.0656E-16	5.0059E+09	7.7451E+02
Kr-87	9.7524E-10	3.4430E-20	2.3832E+05	1.2990E-01
Kr-88	1.8871E-06	1.5050E-16	1.0299E+09	2.5137E+02
I-131	5.6809E-06	4.5823E-14	2.1065E+11	7.5670E+02
I-132	4.6194E-06	4.4752E-16	2.0417E+09	6.1530E+02
I-133	3.5795E-06	3.1598E-15	1.4307E+10	4.7678E+02
I-135	6.0081E-07	1.7108E-16	7.6316E+08	8.0027E+01
Xe-133	1.5099E-03	8.0667E-12	3.6526E+13	2.0112E+05
Xe-135	3.7200E-04	1.4567E-13	6.4982E+11	4.9551E+04

Control Room Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump
Noble gases (atoms)	4.4574E+14	0.0000E+00
Elemental I (atoms)	1.0819E+10	0.0000E+00
Organic I (atoms)	5.6941E+08	0.0000E+00
Aerosols (kg)	4.7121E-14	0.0000E+00
Dose Effective (Ci/cc)	I-131 (Thyroid)	1.2684E-15
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)	1.3753E-15
Total I (Ci)		1.4481E-05

Environment to Control Room Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4574E+14
Elemental I (atoms)	0.0000E+00	1.0819E+10
Organic I (atoms)	0.0000E+00	5.6941E+08
Aerosols (kg)	0.0000E+00	4.7122E-14

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1245E+09	0.0000E+00
Elemental I (atoms)	2.7293E+04	0.0000E+00
Organic I (atoms)	1.4365E+03	0.0000E+00
Aerosols (kg)	1.1887E-19	0.0000E+00

Exclusion Area Bndry Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.2727E-01	2.7127E+01	1.1623E+00
Accumulated dose (rem)	3.2727E-01	2.7127E+01	1.1623E+00

Low Population Zone Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE

Delta dose (rem)	3.7039E-02	3.0701E+00	1.3155E-01
Accumulated dose (rem)	3.7039E-02	3.0701E+00	1.3155E-01

Control Room Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.5255E-02	7.4783E+01	2.3470E+00
Accumulated dose (rem)	4.5255E-02	7.4783E+01	2.3470E+00

Containment Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay

Containment Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	3.4387E-41	0.0000E+00	
Elemental I (atoms)	7.4048E-46	0.0000E+00	
Organic I (atoms)	3.8973E-47	0.0000E+00	
Aerosols (kg)	3.2232E-69	0.0000E+00	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.5106E-67
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.5561E-67
Total I (Ci)			5.3634E-61

Leak to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1996E+22
Elemental I (atoms)	0.0000E+00	2.9085E+17
Organic I (atoms)	0.0000E+00	1.5308E+16
Aerosols (kg)	0.0000E+00	1.2668E-06

Environment Integral Nuclide Release:

Time (h) = 48.0000	Ci	kg	Atoms	Bq
Kr-85	6.1001E+02	1.5548E-03	1.1016E+22	2.2570E+13
Kr-85m	1.5209E+02	1.8480E-08	1.3093E+17	5.6272E+12
Kr-87	2.3705E-02	8.3689E-13	5.7930E+12	8.7710E+08
Kr-88	4.8518E+01	3.8693E-09	2.6479E+16	1.7952E+12
I-131	1.5306E+02	1.2346E-06	5.6755E+18	5.6632E+12
I-132	1.1748E+02	1.1381E-08	5.1923E+16	4.3466E+12
I-133	9.5874E+01	8.4634E-08	3.8321E+17	3.5473E+12
I-134	1.1801E-06	4.4236E-17	1.9880E+08	4.3662E+04
I-135	1.5868E+01	4.5183E-09	2.0155E+16	5.8710E+11
Xe-133	4.0667E+04	2.1726E-04	9.8373E+20	1.5047E+15
Xe-135	9.8802E+03	3.8689E-06	1.7259E+19	3.6557E+14

Environment Transport Group Inventory:

Time (h) = 48.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.2017E+22	1.3908E+17	
Elemental I (atoms)	2.9121E+17	3.3705E+12	
Organic I (atoms)	1.5327E+16	1.7740E+11	
Aerosols (kg)	1.2684E-06	1.4680E-11	
Dose Effective (Ci) I-131 (Thyroid)			1.7018E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.8424E+02
Total I (Ci)			3.8228E+02

Leak to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1996E+22
Elemental I (atoms)	0.0000E+00	2.9085E+17
Organic I (atoms)	0.0000E+00	1.5308E+16
Aerosols (kg)	0.0000E+00	1.2668E-06

Environment to Control Room Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4857E+20
Elemental I (atoms)	0.0000E+00	3.6021E+15
Organic I (atoms)	0.0000E+00	1.8958E+14
Aerosols (kg)	0.0000E+00	1.5689E-08

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.4903E+20	0.0000E+00
Elemental I (atoms)	3.6099E+15	0.0000E+00
Organic I (atoms)	1.9000E+14	0.0000E+00
Aerosols (kg)	1.5723E-08	0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay

Control Room Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6266E-42	0.0000E+00	
Elemental I (atoms)	3.5027E-47	0.0000E+00	
Organic I (atoms)	1.8435E-48	0.0000E+00	
Aerosols (kg)	1.5246E-70	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.0599E-72
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		4.1822E-72
Total I (Ci)			2.5370E-62

Environment to Control Room Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4857E+20
Elemental I (atoms)	0.0000E+00	3.6021E+15
Organic I (atoms)	0.0000E+00	1.8958E+14
Aerosols (kg)	0.0000E+00	1.5689E-08

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.4903E+20	0.0000E+00
Elemental I (atoms)	3.6099E+15	0.0000E+00
Organic I (atoms)	1.9000E+14	0.0000E+00
Aerosols (kg)	1.5723E-08	0.0000E+00

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#####################################################################
                          I-131 Summary
#####################################################################
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Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
24.000	1.5317E+02	4.5950E-04	5.6809E-06
24.400	1.3875E+01	1.3919E+02	3.0582E-01
24.700	2.2911E+00	1.5077E+02	7.2217E-02
25.000	3.7831E-01	1.5268E+02	1.4165E-02
25.300	6.2466E-02	1.5300E+02	2.5701E-03
25.600	1.0314E-02	1.5305E+02	4.4821E-04
25.900	1.7031E-03	1.5306E+02	7.6469E-05
26.200	2.8122E-04	1.5306E+02	1.2880E-05
26.500	4.6436E-05	1.5306E+02	2.1530E-06
26.800	7.6675E-06	1.5306E+02	3.5820E-07
27.100	1.2661E-06	1.5306E+02	5.9425E-08
27.400	2.0905E-07	1.5306E+02	9.8410E-09
27.700	3.4519E-08	1.5306E+02	1.6279E-09
28.000	5.6998E-09	1.5306E+02	2.6911E-10
28.300	9.4116E-10	1.5306E+02	4.4467E-11
28.600	1.5541E-10	1.5306E+02	7.3456E-12
28.900	2.5661E-11	1.5306E+02	1.2133E-12
29.200	4.2371E-12	1.5306E+02	2.0037E-13
29.500	6.9964E-13	1.5306E+02	3.3089E-14
29.800	1.1552E-13	1.5306E+02	5.4640E-15
30.100	1.9076E-14	1.5306E+02	9.0225E-16
30.400	3.1498E-15	1.5306E+02	1.4898E-16
30.700	5.2009E-16	1.5306E+02	2.4601E-17
31.000	8.5878E-17	1.5306E+02	4.0622E-18
31.300	1.4180E-17	1.5306E+02	6.7075E-19
31.600	2.3415E-18	1.5306E+02	1.1076E-19
31.900	3.8662E-19	1.5306E+02	1.8288E-20
32.200	6.3840E-20	1.5306E+02	3.0198E-21
32.500	1.0541E-20	1.5306E+02	4.9863E-22
32.800	1.7406E-21	1.5306E+02	8.2333E-23
33.100	2.8741E-22	1.5306E+02	1.3595E-23
33.400	4.7457E-23	1.5306E+02	2.2448E-24
33.700	7.8361E-24	1.5306E+02	3.7067E-25
34.000	1.2939E-24	1.5306E+02	6.1205E-26
34.300	2.1365E-25	1.5306E+02	1.0106E-26
48.000	4.0675E-61	1.5306E+02	1.9240E-62

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

Time	Exclusion Area Bndry Thyroid	Exclusion Area Bndry TEDE	Low Population Zone Thyroid	Low Population Zone TEDE	Control Room Thyroid	Control Room TEDE
(hr)	(rem)	(rem)	(rem)	(rem)	(rem)	(rem)
24.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
24.400	2.4673E+01	1.0579E+00	2.7925E+00	1.1973E-01	5.5507E+01	1.7425E+00
24.700	2.6722E+01	1.1452E+00	3.0243E+00	1.2961E-01	7.0702E+01	2.2190E+00
25.000	2.7060E+01	1.1595E+00	3.0626E+00	1.3123E-01	7.4017E+01	2.3230E+00
25.300	2.7116E+01	1.1619E+00	3.0689E+00	1.3150E-01	7.4647E+01	2.3427E+00
25.600	2.7125E+01	1.1623E+00	3.0699E+00	1.3154E-01	7.4760E+01	2.3462E+00
25.900	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4779E+01	2.3468E+00

26.200	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4782E+01	2.3469E+00
26.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
26.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
27.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
27.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
27.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
28.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
28.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
28.600	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
28.900	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
29.200	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
29.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
29.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
30.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
30.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
30.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
31.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
31.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
31.600	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
31.900	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
32.200	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
32.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
32.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
33.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
33.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
33.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
34.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
34.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00
48.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3155E-01	7.4783E+01	2.3470E+00

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

Exclusion Area Bndry

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
24.0	3.2727E-01	2.7127E+01	1.1623E+00

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/10/2003  at 14:19:10
#######################################################################

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

 Plant file           = P:\Users\Nuc\Exelon EOC\Discipline
Files\Process\AST\Peach Bottom AST\Pbaps FHA\RADTRAD\PBAPS FHA 0hr Delay Test -
No Filter Credit-22200.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3.03\defaults\fgr11&12.inp



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


 Radtrad 3.03 4/15/2001
 PBAPS FHA - TB/RB Ventilation Stack to CR Intake, EAB, & LPZ - 24 Hour Delay
and No Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
```

```
  0
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\fgr11&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  0.0000E+00
  1
  9.5000E-01   4.7500E-02   2.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  1
  1
  0
  0
  0
  0
  0
  0
```

```
  0
Compartment 2:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.2200E+04   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   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
  2
  0.0000E+00   2.2200E+04   1.0000E+02   1.0000E+02   1.0000E+02
  2.4000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  0.0000E+00   4.2500E-04
  2.4000E+01   0.0000E+00
  1
  2
  0.0000E+00   3.4700E-04
  2.4000E+01   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  0.0000E+00   4.8100E-05
  2.4000E+01   0.0000E+00
  1
  2
  0.0000E+00   3.4700E-04
  2.4000E+01   0.0000E+00
  0
Location 3:
Control Room
  3
  0
  1
  2
  0.0000E+00   3.4700E-04
  2.4000E+01   0.0000E+00
  1

  2
  0.0000E+00   1.0000E+00
  2.4000E+01   0.0000E+00
Effective Volume Location:
  1
  2
  0.0000E+00   1.1800E-03
  2.4000E+01   0.0000E+00
Simulation Parameters:
  5
  0.0000E+00   1.0000E-03
```

```
  1.0000E-02   1.0000E-02
  1.0000E-01   1.0000E-01
  1.0000E+00   1.0000E+00
  2.4000E+01   0.0000E+00
 Output Filename:
 P:\Users\Nuc\Exelon EOC\Discipline Files\Process\AST\Peach Bottom AST\Pbaps
FHA\RADTRAD\PBAPS FHA 0hr Delay Test - No Filter Credit-22200.o0
  1
  1
  1
  0
  0
 End of Scenario File

 ######################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  4/10/2003  at 14:19:10
 ######################################################################

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

 Number of Nuclides =  60

 Inventory Power =   1.0000E+00 MWth
 Plant Power Level =   1.5460E+01 MWth

 Number of compartments    =   3

 Compartment information

 Compartment number  1  (Source term fraction =   1.0000E+00
 )
 Name: Containment
 Compartment volume =   1.0000E+02 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  1
    Exit Pathway Number    1: Leak to Environment

 Compartment number  2
 Name: Environment
 Compartment type is Environment
 Pathways into and out of compartment  2
    Inlet Pathway Number   1: Leak to Environment
    Inlet Pathway Number   3: Control Room to  Environment Exhaust
    Exit Pathway Number    2: Environment to  Control Room

 Compartment number  3
 Name: Control Room
 Compartment volume =   1.7600E+05 (Cubic feet)
 Compartment type is Control Room
 Pathways into and out of compartment  3
    Inlet Pathway Number   2: Environment to  Control Room
    Exit Pathway Number    3: Control Room to  Environment Exhaust

 Total number of pathways =   3
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/10/2003  at 14:19:10
#######################################################################

#######################################################################
                        Scenario Description
#######################################################################
```

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.000001 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	5.0000E-02	0.0000E+00	0.0000E+00	1.791E+00
IODINE	2.5000E-04	0.0000E+00	0.0000E+00	1.610E-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 = 15. MWt

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Kr-85	1	7.892E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	8.313E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.633E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	2.303E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
I-131	2	4.299E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.881E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.556E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.165E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.192E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.491E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	2.228E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00
Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00

Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Iodine fractions

Aerosol	=	9.5000E-01
Elemental	=	4.7500E-02
Organic	=	2.5000E-03

COMPARTMENT DATA

Compartment number 1: Containment

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Leak to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.0000E+01	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: Environment to Control Room

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.2200E+04	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 3: Control Room to Environment Exhaust

Pathway Filter: Removal Data

```
      Time (hr)       Flow Rate          Filter Efficiencies (%)
                       (cfm)         Aerosol     Elemental    Organic
      0.0000E+00    2.2200E+04    1.0000E+02   1.0000E+02   1.0000E+02
      2.4000E+01    0.0000E+00    0.0000E+00   0.0000E+00   0.0000E+00

LOCATION DATA
     Location Exclusion Area Bndry     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.2500E-04
       2.4000E+01          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       0.0000E+00                 3.4700E-04
       2.4000E+01                 0.0000E+00
     Location Low Population Zone     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.8100E-05
       2.4000E+01          0.0000E+00

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

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          1.1800E-03
       2.4000E+01          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       0.0000E+00                 3.4700E-04
       2.4000E+01                 0.0000E+00

     Location Occupancy Factor Data
      Time (hr)         Occupancy Factor
       0.0000E+00            1.0000E+00
       2.4000E+01            0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
     Time            Time step
      0.0000E+00       1.0000E-03
      1.0000E-02       1.0000E-02
      1.0000E-01       1.0000E-01
      1.0000E+00       1.0000E+00
      2.4000E+01       0.0000E+00

#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  4/10/2003  at 14:19:10
#######################################################################
```

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

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

Exclusion Area Bndry Doses:

Time (h) = 0.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2874E-05	9.9824E-05	1.5995E-05
Accumulated dose (rem)	1.2874E-05	9.9824E-05	1.5995E-05

Low Population Zone Doses:

Time (h) = 0.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4570E-06	1.1298E-05	1.8103E-06
Accumulated dose (rem)	1.4570E-06	1.1298E-05	1.8103E-06

Control Room Doses:

Time (h) = 0.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.8364E-12	1.0488E-09	3.9633E-11
Accumulated dose (rem)	6.8364E-12	1.0488E-09	3.9633E-11

Containment Compartment Nuclide Inventory:

Time (h) = 0.0000	Ci	kg	Atoms	Decay
Kr-85	6.1005E+02	1.5549E-03	1.1016E+22	8.1258E+10
Kr-85m	6.4259E+03	7.8084E-07	5.5321E+18	8.5593E+11
Kr-87	1.2623E+04	4.4564E-07	3.0847E+18	1.6814E+12
Kr-88	1.7802E+04	1.4197E-06	9.7156E+18	2.3712E+12
I-131	1.6616E+02	1.3402E-06	6.1611E+18	2.2132E+10
I-132	1.5000E+02	1.4532E-08	6.6298E+16	1.9980E+10
I-133	2.1474E+02	1.8956E-07	8.5833E+17	2.8603E+10
I-134	2.3828E+02	8.9320E-09	4.0142E+16	3.1738E+10
I-135	2.0067E+02	5.7141E-08	2.5490E+17	2.6729E+10
Xe-133	4.2445E+04	2.2676E-04	1.0268E+21	5.6537E+12
Xe-135	1.7222E+04	6.7440E-06	3.0084E+19	2.2940E+12

Containment Transport Group Inventory:

Time (h) = 0.0000	Atmosphere	Sump	
Noble gases (atoms)	1.2092E+22	0.0000E+00	
Elemental I (atoms)	3.5059E+17	0.0000E+00	
Organic I (atoms)	1.8452E+16	0.0000E+00	
Aerosols (kg)	1.5299E-06	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.3751E-05
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		8.8189E-05
Total I (Ci)			9.6984E+02

Leak to Environment Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6275E+16
Elemental I (atoms)	0.0000E+00	1.0518E+12
Organic I (atoms)	0.0000E+00	5.5356E+10
Aerosols (kg)	0.0000E+00	4.5897E-12

Environment Integral Nuclide Release:

Time (h) = 0.0000	Ci	kg	Atoms	Bq
Kr-85	1.8302E-03	4.6648E-09	3.3049E+16	6.7716E+07
Kr-85m	1.9278E-02	2.3425E-12	1.6596E+13	7.1328E+08
Kr-87	3.7869E-02	1.3369E-12	9.2542E+12	1.4012E+09
Kr-88	5.3406E-02	4.2591E-12	2.9147E+13	1.9760E+09
I-131	4.9847E-04	4.0207E-12	1.8483E+13	1.8443E+07
I-132	4.5000E-04	4.3596E-14	1.9889E+11	1.6650E+07
I-133	6.4422E-04	5.6869E-13	2.5750E+12	2.3836E+07
I-134	7.1483E-04	2.6796E-14	1.2042E+11	2.6449E+07
I-135	6.0201E-04	1.7142E-13	7.6469E+11	2.2274E+07
Xe-133	1.2734E-01	6.8028E-10	3.0803E+15	4.7114E+09
Xe-135	5.1667E-02	2.0232E-11	9.0252E+13	1.9117E+09

Environment Transport Group Inventory:

Time (h) = 0.0000	Total Release	Release Rate/s
Noble gases (atoms)	3.6275E+16	1.0076E+19
Elemental I (atoms)	1.0518E+12	2.9216E+14
Organic I (atoms)	5.5356E+10	1.5377E+13
Aerosols (kg)	4.5897E-12	1.2749E-09
Dose Effective (Ci) I-131 (Thyroid)		6.2652E-04
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		7.4917E-04
Total I (Ci)		2.9095E-03

Leak to Environment Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6275E+16
Elemental I (atoms)	0.0000E+00	1.0518E+12
Organic I (atoms)	0.0000E+00	5.5356E+10
Aerosols (kg)	0.0000E+00	4.5897E-12

Environment to Control Room Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4847E+14
Elemental I (atoms)	0.0000E+00	1.3003E+10
Organic I (atoms)	0.0000E+00	6.8438E+08
Aerosols (kg)	0.0000E+00	5.6743E-14

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1314E+09	0.0000E+00

Elemental I (atoms)	3.2803E+04	0.0000E+00
Organic I (atoms)	1.7265E+03	0.0000E+00
Aerosols (kg)	1.4315E-19	0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) = 0.0000	Ci	kg	Atoms	Decay
Kr-85	2.2626E-05	5.7671E-11	4.0859E+14	3.0138E+03
Kr-85m	2.3833E-04	2.8961E-14	2.0518E+11	3.1746E+04
Kr-87	4.6818E-04	1.6529E-14	1.1441E+11	6.2362E+04
Kr-88	6.6027E-04	5.2656E-14	3.6034E+11	8.7948E+04
I-131	6.1626E-06	4.9709E-14	2.2851E+11	8.2086E+02
I-132	5.5634E-06	5.3898E-16	2.4589E+09	7.4105E+02
I-133	7.9645E-06	7.0308E-15	3.1835E+10	1.0609E+03
I-134	8.8375E-06	3.3128E-16	1.4888E+09	1.1772E+03
I-135	7.4427E-06	2.1193E-15	9.4539E+09	9.9137E+02
Xe-133	1.5743E-03	8.4104E-12	3.8082E+13	2.0969E+05
Xe-135	6.3877E-04	2.5013E-13	1.1158E+12	8.5084E+04

Control Room Transport Group Inventory:

Time (h) = 0.0000	Atmosphere	Sump	
Noble gases (atoms)	4.4847E+14	0.0000E+00	
Elemental I (atoms)	1.3003E+10	0.0000E+00	
Organic I (atoms)	6.8437E+08	0.0000E+00	
Aerosols (kg)	5.6743E-14	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.5542E-15
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.8585E-15
Total I (Ci)			3.5971E-05

Environment to Control Room Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4847E+14
Elemental I (atoms)	0.0000E+00	1.3003E+10
Organic I (atoms)	0.0000E+00	6.8438E+08
Aerosols (kg)	0.0000E+00	5.6743E-14

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 0.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1314E+09	0.0000E+00
Elemental I (atoms)	3.2803E+04	0.0000E+00
Organic I (atoms)	1.7265E+03	0.0000E+00
Aerosols (kg)	1.4315E-19	0.0000E+00

Exclusion Area Bndry Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.1282E+00	3.3212E+01	5.1662E+00
Accumulated dose (rem)	4.1283E+00	3.3212E+01	5.1662E+00

Low Population Zone Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6722E-01	3.7588E+00	5.8469E-01
Accumulated dose (rem)	4.6722E-01	3.7589E+00	5.8469E-01

Control Room Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.5706E-01	9.1499E+01	3.4152E+00
Accumulated dose (rem)	5.5706E-01	9.1499E+01	3.4152E+00

Containment Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay

Containment Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	3.4506E-41	0.0000E+00	
Elemental I (atoms)	8.3303E-46	0.0000E+00	
Organic I (atoms)	4.3844E-47	0.0000E+00	
Aerosols (kg)	3.6281E-69	0.0000E+00	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.7272E-67
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.8357E-67
Total I (Ci)			7.6780E-61

Leak to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2069E+22
Elemental I (atoms)	0.0000E+00	3.4916E+17
Organic I (atoms)	0.0000E+00	1.8377E+16
Aerosols (kg)	0.0000E+00	1.5236E-06

Environment Integral Nuclide Release:

Time (h) = 24.0000	Ci	kg	Atoms	Bq
Kr-85	6.1005E+02	1.5549E-03	1.1016E+22	2.2572E+13
Kr-85m	6.2337E+03	7.5748E-07	5.3667E+18	2.3065E+14
Kr-87	1.1380E+04	4.0176E-07	2.7810E+18	4.2107E+14
Kr-88	1.6975E+04	1.3538E-06	9.2644E+18	6.2809E+14
I-131	1.6604E+02	1.3393E-06	6.1568E+18	6.1434E+12
I-132	1.4148E+02	1.3707E-08	6.2534E+16	5.2349E+12
I-133	2.1333E+02	1.8832E-07	8.5268E+17	7.8930E+12
I-134	2.0560E+02	7.7072E-09	3.4637E+16	7.6073E+12
I-135	1.9657E+02	5.5972E-08	2.4968E+17	7.2729E+12
Xe-133	4.2399E+04	2.2651E-04	1.0256E+21	1.5688E+15
Xe-135	1.6967E+04	6.6442E-06	2.9639E+19	6.2779E+14

Environment Transport Group Inventory:

Time (h) = 24.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.2089E+22	1.3992E+17	
Elemental I (atoms)	3.4942E+17	4.0443E+12	
Organic I (atoms)	1.8391E+16	2.1286E+11	
Aerosols (kg)	1.5247E-06	1.7647E-11	
Dose Effective (Ci) I-131 (Thyroid)			2.0828E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.4802E+02
Total I (Ci)			9.2302E+02

Leak to Environment Transport Group Inventory:

Pathway

```
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)     0.0000E+00  1.2069E+22
Elemental I (atoms)     0.0000E+00  3.4916E+17
Organic I (atoms)       0.0000E+00  1.8377E+16
Aerosols (kg)           0.0000E+00  1.5236E-06

Environment to  Control Room Transport Group Inventory:

                         Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)     0.0000E+00  1.4947E+20
Elemental I (atoms)     0.0000E+00  4.3242E+15
Organic I (atoms)       0.0000E+00  2.2759E+14
Aerosols (kg)           0.0000E+00  1.8869E-08

Control Room to  Environment Exhaust Transport Group Inventory:

                         Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)     1.4992E+20  0.0000E+00
Elemental I (atoms)     4.3295E+15  0.0000E+00
Organic I (atoms)       2.2787E+14  0.0000E+00
Aerosols (kg)           1.8892E-08  0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) =  24.0000        Ci            kg          Atoms      Decay

Control Room Transport Group Inventory:
Time (h) =  24.0000     Atmosphere     Sump
Noble gases (atoms)     1.6322E-42  0.0000E+00
Elemental I (atoms)     3.9405E-47  0.0000E+00
Organic I (atoms)       2.0739E-48  0.0000E+00
Aerosols (kg)           1.7162E-70  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          4.6421E-72
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    4.9338E-72
Total I (Ci)                                    3.6319E-62

Environment to  Control Room Transport Group Inventory:

                         Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)     0.0000E+00  1.4947E+20
Elemental I (atoms)     0.0000E+00  4.3242E+15
Organic I (atoms)       0.0000E+00  2.2759E+14
Aerosols (kg)           0.0000E+00  1.8869E-08

Control Room to  Environment Exhaust Transport Group Inventory:

                         Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)     1.4992E+20  0.0000E+00
Elemental I (atoms)     4.3295E+15  0.0000E+00
Organic I (atoms)       2.2787E+14  0.0000E+00
Aerosols (kg)           1.8892E-08  0.0000E+00

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

I-131 Summary

Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
0.000	1.6616E+02	4.9847E-04	6.1626E-06
0.400	1.5052E+01	1.5100E+02	3.3175E-01
0.700	2.4854E+00	1.6355E+02	7.8341E-02
1.000	4.1038E-01	1.6563E+02	1.5366E-02
1.300	6.7763E-02	1.6597E+02	2.7880E-03
1.600	1.1189E-02	1.6603E+02	4.8622E-04
1.900	1.8476E-03	1.6604E+02	8.2953E-05
2.200	3.0507E-04	1.6604E+02	1.3972E-05
2.500	5.0373E-05	1.6604E+02	2.3355E-06
2.800	8.3177E-06	1.6604E+02	3.8857E-07
3.100	1.3734E-06	1.6604E+02	6.4463E-08
3.400	2.2678E-07	1.6604E+02	1.0675E-08
3.700	3.7446E-08	1.6604E+02	1.7659E-09
4.000	6.1832E-09	1.6604E+02	2.9193E-10
4.300	1.0210E-09	1.6604E+02	4.8237E-11
4.600	1.6858E-10	1.6604E+02	7.9685E-12
4.900	2.7837E-11	1.6604E+02	1.3161E-12
5.200	4.5964E-12	1.6604E+02	2.1736E-13
5.500	7.5896E-13	1.6604E+02	3.5894E-14
5.800	1.2532E-13	1.6604E+02	5.9273E-15
6.100	2.0693E-14	1.6604E+02	9.7876E-16
6.400	3.4168E-15	1.6604E+02	1.6162E-16
6.700	5.6419E-16	1.6604E+02	2.6687E-17
7.000	9.3160E-17	1.6604E+02	4.4066E-18
7.300	1.5383E-17	1.6604E+02	7.2763E-19
7.600	2.5400E-18	1.6604E+02	1.2015E-19
7.900	4.1941E-19	1.6604E+02	1.9839E-20
8.200	6.9253E-20	1.6604E+02	3.2758E-21
8.500	1.1435E-20	1.6604E+02	5.4091E-22
8.800	1.8882E-21	1.6604E+02	8.9315E-23
9.100	3.1178E-22	1.6604E+02	1.4748E-23
9.400	5.1481E-23	1.6604E+02	2.4352E-24
9.700	8.5005E-24	1.6604E+02	4.0210E-25
10.000	1.4036E-24	1.6604E+02	6.6394E-26
10.300	2.3177E-25	1.6604E+02	1.0963E-26
24.000	4.4124E-61	1.6604E+02	2.0871E-62

Cumulative Dose Summary

Time	Exclusion Area Bndry Thyroid	Exclusion Area Bndry TEDE	Low Population Zone Thyroid	Low Population Zone TEDE	Control Room Thyroid	Control Room TEDE
(hr)	(rem)	(rem)	(rem)	(rem)	(rem)	(rem)
0.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.400	3.0215E+01	4.7360E+00	3.4196E+00	5.3600E-01	6.7951E+01	2.5476E+00
0.700	3.2719E+01	5.0995E+00	3.7030E+00	5.7715E-01	8.6520E+01	3.2339E+00
1.000	3.3131E+01	5.1559E+00	3.7497E+00	5.8352E-01	9.0566E+01	3.3816E+00
1.300	3.3199E+01	5.1646E+00	3.7573E+00	5.8451E-01	9.1334E+01	3.4093E+00
1.600	3.3210E+01	5.1660E+00	3.7586E+00	5.8467E-01	9.1471E+01	3.4142E+00
1.900	3.3212E+01	5.1662E+00	3.7588E+00	5.8469E-01	9.1494E+01	3.4150E+00
2.200	3.3212E+01	5.1662E+00	3.7588E+00	5.8469E-01	9.1498E+01	3.4152E+00
2.500	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
2.800	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00

3.100	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
3.400	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
3.700	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
4.000	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
4.300	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
4.600	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
4.900	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
5.200	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
5.500	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
5.800	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
6.100	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
6.400	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
6.700	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
7.000	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
7.300	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
7.600	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
7.900	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
8.200	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
8.500	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
8.800	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
9.100	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
9.400	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
9.700	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
10.000	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
10.300	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00
24.000	3.3212E+01	5.1662E+00	3.7589E+00	5.8469E-01	9.1499E+01	3.4152E+00

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

Exclusion Area Bndry

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.0	4.1282E+00	3.3212E+01	5.1662E+00

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:57:43
#######################################################################

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

 Plant file       = F:\PBAPS FHA 6hr Delay - No Filter Credit - Roof
Scuttle.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3.03\defaults\fgr11&12.inp
```

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

```
 Radtrad 3.03 4/15/2001
 PBAPS FHA - RB Roof Scuttle to CR Intake, EAB, & LPZ - 6 Hour Delay and No
Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
   0
```

```
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\fgr11&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  6.0000E+00
  1
  9.5000E-01   4.7500E-02   2.5000E-03   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
  0
  0
  0
Pathways:
  3
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  6.0000E+00   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  3.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  6.0000E+00   2.2200E+04   0.0000E+00   0.0000E+00   0.0000E+00
  3.0000E+01   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
  2
  6.0000E+00   2.2200E+04   1.0000E+02   1.0000E+02   1.0000E+02
  3.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  6.0000E+00   4.2500E-04
  3.0000E+01   0.0000E+00
  1
  2
  6.0000E+00   3.4700E-04
  3.0000E+01   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  6.0000E+00   4.8100E-05
  3.0000E+01   0.0000E+00
  1
  2
  6.0000E+00   3.4700E-04
  3.0000E+01   0.0000E+00
  0
Location 3:
Control Room
  3
  0
  1
  2
  6.0000E+00   3.4700E-04
  3.0000E+01   0.0000E+00
  1
  2
  6.0000E+00   1.0000E+00
  3.0000E+01   0.0000E+00
Effective Volume Location:
  1
  2
  6.0000E+00   1.9300E-03
  3.0000E+01   0.0000E+00
Simulation Parameters:
  5
  6.0000E+00   1.0000E-03
  6.0100E+00   1.0000E-02
  6.1000E+00   1.0000E-01
```

```
  7.0000E+00   1.0000E+00
  3.0000E+01   0.0000E+00
Output Filename:
F:\PBAPS FHA 6hr Delay - No Filter Credit - Roof Scuttle.o0
  0
  0
  1
  0
  0
End of Scenario File
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:57:43
#######################################################################

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

#######################################################################
                              Dose Output
#######################################################################

Exclusion Area Bndry Doses:

Time (h) =   6.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.7564E-06  9.3724E-05  6.6637E-06
Accumulated dose (rem)  3.7564E-06  9.3724E-05  6.6637E-06

Low Population Zone Doses:

Time (h) =   6.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.2513E-07  1.0607E-05  7.5418E-07
Accumulated dose (rem)  4.2513E-07  1.0607E-05  7.5418E-07

Control Room Doses:

Time (h) =   6.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.2626E-12  1.6106E-09  5.3223E-11
Accumulated dose (rem)  3.2626E-12  1.6106E-09  5.3223E-11

Exclusion Area Bndry Doses:

Time (h) =  30.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.2222E+00  3.1194E+01  2.1896E+00
Accumulated dose (rem)  1.2222E+00  3.1194E+01  2.1896E+00

Low Population Zone Doses:

Time (h) =  30.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.3833E-01  3.5304E+00  2.4782E-01
Accumulated dose (rem)  1.3833E-01  3.5304E+00  2.4782E-01

Control Room Doses:

Time (h) =  30.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.7312E-01  1.4060E+02  4.6327E+00
Accumulated dose (rem)  2.7312E-01  1.4060E+02  4.6327E+00
```

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

Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
6.000	1.6285E+02	4.8854E-04	9.8787E-06
6.400	1.4752E+01	1.4799E+02	5.3180E-01
6.700	2.4358E+00	1.6030E+02	1.2558E-01
7.000	4.0221E-01	1.6233E+02	2.4632E-02
7.300	6.6413E-02	1.6266E+02	4.4692E-03
7.600	1.0966E-02	1.6272E+02	7.7941E-04
7.900	1.8107E-03	1.6273E+02	1.3297E-04
8.200	2.9899E-04	1.6273E+02	2.2398E-05
8.500	4.9370E-05	1.6273E+02	3.7439E-06
8.800	8.1520E-06	1.6273E+02	6.2288E-07
9.100	1.3461E-06	1.6273E+02	1.0334E-07
9.400	2.2226E-07	1.6273E+02	1.7113E-08
9.700	3.6700E-08	1.6273E+02	2.8308E-09
10.000	6.0600E-09	1.6273E+02	4.6796E-10
10.300	1.0006E-09	1.6273E+02	7.7325E-11
10.600	1.6522E-10	1.6273E+02	1.2774E-11
10.900	2.7282E-11	1.6273E+02	2.1098E-12
11.200	4.5048E-12	1.6273E+02	3.4843E-13
11.500	7.4384E-13	1.6273E+02	5.7539E-14
11.800	1.2282E-13	1.6273E+02	9.5015E-15
12.100	2.0281E-14	1.6273E+02	1.5690E-15
12.400	3.3488E-15	1.6273E+02	2.5907E-16
12.700	5.5295E-16	1.6273E+02	4.2779E-17
13.000	9.1304E-17	1.6273E+02	7.0638E-18
13.300	1.5076E-17	1.6273E+02	1.1664E-18
13.600	2.4894E-18	1.6273E+02	1.9260E-19
13.900	4.1105E-19	1.6273E+02	3.1802E-20
14.200	6.7873E-20	1.6273E+02	5.2511E-21
14.500	1.1207E-20	1.6273E+02	8.6707E-22
14.800	1.8505E-21	1.6273E+02	1.4317E-22
15.100	3.0556E-22	1.6273E+02	2.3641E-23
15.400	5.0455E-23	1.6273E+02	3.9036E-24
15.700	8.3312E-24	1.6273E+02	6.4456E-25
16.000	1.3756E-24	1.6273E+02	1.0643E-25
16.300	2.2715E-25	1.6273E+02	1.7574E-26
30.000	4.3244E-61	1.6273E+02	3.3457E-62

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

Time (hr)	Exclusion Area Bndry Thyroid (rem)	Exclusion Area Bndry TEDE (rem)	Low Population Zone Thyroid (rem)	Low Population Zone TEDE (rem)	Control Room Thyroid (rem)	Control Room TEDE (rem)
6.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
6.400	2.8376E+01	1.9985E+00	3.2115E+00	2.2618E-01	1.0439E+02	3.4433E+00
6.700	3.0730E+01	2.1589E+00	3.4779E+00	2.4434E-01	1.3294E+02	4.3818E+00
7.000	3.1117E+01	2.1847E+00	3.5218E+00	2.4726E-01	1.3917E+02	4.5858E+00
7.300	3.1181E+01	2.1889E+00	3.5290E+00	2.4773E-01	1.4035E+02	4.6244E+00
7.600	3.1192E+01	2.1895E+00	3.5302E+00	2.4780E-01	1.4056E+02	4.6312E+00
7.900	3.1194E+01	2.1896E+00	3.5304E+00	2.4781E-01	1.4060E+02	4.6324E+00
8.200	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6326E+00

8.500	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
8.800	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
9.100	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
9.400	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
9.700	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
10.000	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
10.300	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
10.600	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
10.900	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
11.200	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
11.500	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
11.800	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
12.100	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
12.400	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
12.700	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
13.000	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
13.300	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
13.600	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
13.900	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
14.200	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
14.500	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
14.800	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
15.100	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
15.400	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
15.700	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
16.000	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
16.300	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00
30.000	3.1194E+01	2.1896E+00	3.5304E+00	2.4782E-01	1.4060E+02	4.6327E+00

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

Exclusion Area Bndry

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
6.0	1.2222E+00	3.1194E+01	2.1896E+00

```
 ######################################################################
    RADTRAD Version 3.03 (Spring 2001) run on 12/10/2004  at 13:52:42
 ######################################################################

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

 Plant file           = F:\PBAPS FHA 24hr Delay - No Filter Credit - Roof
Scuttle.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3.03\defaults\fgr11&12.inp



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


 Radtrad 3.03 4/15/2001
 PBAPS FHA - RB Roof Scuttle to CR Intake, EAB, & LPZ - 24 Hour Delay and No
Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
   0
```

```
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\fgr11&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  2.4000E+01
  1
  9.5000E-01   4.7500E-02   2.5000E-03   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
  0
  0
  0
Pathways:
  3
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  2.4000E+01   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  2.4000E+01   2.2200E+04   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   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
  2
  2.4000E+01   2.2200E+04   1.0000E+02   1.0000E+02   1.0000E+02
  4.8000E+01   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  2.4000E+01   4.2500E-04
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  2.4000E+01   4.8100E-05
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  0
Location 3:
Control Room
  3
  0
  1
  2
  2.4000E+01   3.4700E-04
  4.8000E+01   0.0000E+00
  1
  2
  2.4000E+01   1.0000E+00
  4.8000E+01   0.0000E+00
Effective Volume Location:
  1
  2
  2.4000E+01   1.9300E-03
  4.8000E+01   0.0000E+00
Simulation Parameters:
  5
  2.4000E+01   1.0000E-03
  2.4010E+01   1.0000E-02
  2.4100E+01   1.0000E-01
```

```
  2.5000E+01   1.0000E+00
  4.8000E+01   0.0000E+00
Output Filename:
F:\PBAPS FHA 24hr Delay - No Filter Credit - Roof Scuttle.o1
  0
  0
  1
  0
  0
End of Scenario File
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/10/2004  at 13:52:42
#######################################################################
```

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

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

Exclusion Area Bndry Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.9171E-07	8.1471E-05	3.5001E-06
Accumulated dose (rem)	9.9171E-07	8.1471E-05	3.5001E-06

Low Population Zone Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1224E-07	9.2206E-06	3.9613E-07
Accumulated dose (rem)	1.1224E-07	9.2206E-06	3.9613E-07

Control Room Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.6135E-13	1.4000E-09	4.3967E-11
Accumulated dose (rem)	8.6135E-13	1.4000E-09	4.3967E-11

Exclusion Area Bndry Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.2722E-01	2.7126E+01	1.1623E+00
Accumulated dose (rem)	3.2722E-01	2.7127E+01	1.1623E+00

Low Population Zone Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.7033E-02	3.0701E+00	1.3154E-01
Accumulated dose (rem)	3.7033E-02	3.0701E+00	1.3154E-01

Control Room Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.4237E-02	1.2269E+02	3.8504E+00
Accumulated dose (rem)	7.4237E-02	1.2269E+02	3.8504E+00

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

Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
24.000	1.5317E+02	4.5950E-04	9.2916E-06
24.400	1.3875E+01	1.3920E+02	5.0020E-01
24.700	2.2911E+00	1.5077E+02	1.1812E-01
25.000	3.7831E-01	1.5268E+02	2.3168E-02
25.300	6.2466E-02	1.5300E+02	4.2036E-03
25.600	1.0314E-02	1.5305E+02	7.3309E-04
25.900	1.7031E-03	1.5306E+02	1.2507E-04
26.200	2.8122E-04	1.5306E+02	2.1067E-05
26.500	4.6436E-05	1.5306E+02	3.5214E-06
26.800	7.6675E-06	1.5306E+02	5.8587E-07
27.100	1.2661E-06	1.5306E+02	9.7194E-08
27.400	2.0905E-07	1.5306E+02	1.6096E-08
27.700	3.4519E-08	1.5306E+02	2.6626E-09
28.000	5.6998E-09	1.5306E+02	4.4015E-10
28.300	9.4116E-10	1.5306E+02	7.2730E-11
28.600	1.5541E-10	1.5306E+02	1.2014E-11
28.900	2.5661E-11	1.5306E+02	1.9844E-12
29.200	4.2371E-12	1.5306E+02	3.2772E-13
29.500	6.9964E-13	1.5306E+02	5.4119E-14
29.800	1.1552E-13	1.5306E+02	8.9368E-15
30.100	1.9076E-14	1.5306E+02	1.4757E-15
30.400	3.1498E-15	1.5306E+02	2.4368E-16
30.700	5.2009E-16	1.5306E+02	4.0237E-17
31.000	8.5878E-17	1.5306E+02	6.6441E-18
31.300	1.4180E-17	1.5306E+02	1.0971E-18
31.600	2.3415E-18	1.5306E+02	1.8115E-19
31.900	3.8662E-19	1.5306E+02	2.9912E-20
32.200	6.3840E-20	1.5306E+02	4.9391E-21
32.500	1.0541E-20	1.5306E+02	8.1555E-22
32.800	1.7406E-21	1.5306E+02	1.3466E-22
33.100	2.8741E-22	1.5306E+02	2.2236E-23
33.400	4.7457E-23	1.5306E+02	3.6716E-24
33.700	7.8361E-24	1.5306E+02	6.0626E-25
34.000	1.2939E-24	1.5306E+02	1.0011E-25
34.300	2.1365E-25	1.5306E+02	1.6530E-26
48.000	4.0675E-61	1.5306E+02	3.1469E-62

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

Time	Exclusion Area Bndry Thyroid	Exclusion Area Bndry TEDE	Low Population Zone Thyroid	Low Population Zone TEDE	Control Room Thyroid	Control Room TEDE
(hr)	(rem)	(rem)	(rem)	(rem)	(rem)	(rem)
24.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
24.400	2.4673E+01	1.0579E+00	2.7924E+00	1.1973E-01	9.1160E+01	2.8616E+00
24.700	2.6722E+01	1.1451E+00	3.0243E+00	1.2960E-01	1.1601E+02	3.6411E+00
25.000	2.7060E+01	1.1595E+00	3.0625E+00	1.3122E-01	1.2143E+02	3.8111E+00
25.300	2.7116E+01	1.1618E+00	3.0688E+00	1.3149E-01	1.2247E+02	3.8434E+00
25.600	2.7125E+01	1.1622E+00	3.0699E+00	1.3153E-01	1.2265E+02	3.8492E+00
25.900	2.7126E+01	1.1622E+00	3.0701E+00	1.3154E-01	1.2268E+02	3.8502E+00
26.200	2.7126E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8503E+00

26.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8503E+00
26.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
27.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
27.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
27.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
28.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
28.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
28.600	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
28.900	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
29.200	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
29.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
29.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
30.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
30.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
30.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
31.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
31.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
31.600	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
31.900	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
32.200	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
32.500	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
32.800	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
33.100	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
33.400	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
33.700	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
34.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
34.300	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00
48.000	2.7127E+01	1.1623E+00	3.0701E+00	1.3154E-01	1.2269E+02	3.8504E+00

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

Exclusion Area Bndry

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
24.0	3.2722E-01	2.7126E+01	1.1623E+00

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:51:54
#######################################################################

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

 Plant file           = F:\PBAPS FHA 468hr Delay - No Filter Credit - Worst
Hatch.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3.03\defaults\fgr11&12.inp
```

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

```
 Radtrad 3.03 4/15/2001
 PBAPS FHA - TB/RB Ventilation Stack to CR Intake, EAB, & LPZ - 468 Hour Delay
and No Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
   0
```

```
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\fgrl1&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  4.6800E+02
  1
  9.5000E-01   4.7500E-02   2.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  1
  1
  0
  0
  0
  0
  0
  0
  0
```

```
Compartment 2:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  3
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  4.6800E+02   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  4.9200E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  4.6800E+02   4.6000E+03   0.0000E+00   0.0000E+00   0.0000E+00
  4.9200E+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
  2
  4.6800E+02   4.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  4.9200E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  4.6800E+02   4.2500E-04
  4.9200E+02   0.0000E+00
  1
  2
  4.6800E+02   3.4700E-04
  4.9200E+02   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  4.6800E+02   4.8100E-05
  4.9200E+02   0.0000E+00
  1
  2
  4.6800E+02   3.4700E-04
  4.9200E+02   0.0000E+00
  0
Location 3:
Control Room
  3
  0
  1
  2
  4.6800E+02   3.4700E-04
  4.9200E+02   0.0000E+00
  1
  2
  4.6800E+02   1.0000E+00
  4.9200E+02   0.0000E+00
Effective Volume Location:
  1
  2
  4.6800E+02   1.2800E-02
  4.9200E+02   0.0000E+00
Simulation Parameters:
  5
  4.6800E+02   1.0000E-03
  4.6801E+02   1.0000E-02
  4.6810E+02   1.0000E-01
```

```
  4.6900E+02   1.0000E+00
  4.9200E+02   0.0000E+00
Output Filename:
F:\PBAPS FHA 468hr Delay - No Filter Credit - Worst Hatch.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:51:54
#######################################################################

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

Number of Nuclides =  60

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   1.5460E+01 MWth

Number of compartments    =  3

Compartment information

Compartment number  1  (Source term fraction =   1.0000E+00
)
Name: Containment
Compartment volume =   1.0000E+02 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: Leak to Environment

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Leak to Environment
   Inlet Pathway Number   3: Control Room to  Environment Exhaust
   Exit Pathway Number    2: Environment to  Control Room

Compartment number  3
Name: Control Room
Compartment volume =   1.7600E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environment to  Control Room
   Exit Pathway Number    3: Control Room to  Environment Exhaust

Total number of pathways =   3
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:51:54
#######################################################################

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


Time between shutdown and first release =   4.6800E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings
                GAP        EARLY IN-VESSEL  LATE RELEASE    RELEASE MASS
             0.000001 hr    0.0000 hrs       0.0000 hrs          (gm)
NOBLES       5.0000E-02     0.0000E+00       0.0000E+00        1.791E+00
IODINE       2.5000E-04     0.0000E+00       0.0000E+00        1.610E-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 =        15. MWt
```

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Kr-85	1	7.892E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	8.313E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.633E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	2.303E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
I-131	2	4.299E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.881E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.556E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.165E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.192E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.491E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	2.228E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00

Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00
Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Iodine fractions

Aerosol = 9.5000E-01
Elemental = 4.7500E-02
Organic = 2.5000E-03

COMPARTMENT DATA

Compartment number 1: Containment

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Leak to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
4.6800E+02	1.0000E+01	0.0000E+00	0.0000E+00	0.0000E+00
4.9200E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: Environment to Control Room

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
4.6800E+02	4.6000E+03	0.0000E+00	0.0000E+00	0.0000E+00
4.9200E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

```
Pathway number  3: Control Room to  Environment Exhaust

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       4.6800E+02    4.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
       4.9200E+02    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

LOCATION DATA
     Location Exclusion Area Bndry     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       4.6800E+02          4.2500E-04
       4.9200E+02          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       4.6800E+02                 3.4700E-04
       4.9200E+02                 0.0000E+00
     Location Low Population Zone     is in compartment   2

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       4.6800E+02          4.8100E-05
       4.9200E+02          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       4.6800E+02                 3.4700E-04
       4.9200E+02                 0.0000E+00
     Location Control Room     is in compartment   3

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       4.6800E+02          1.2800E-02
       4.9200E+02          0.0000E+00

     Location Breathing Rate Data
      Time (hr)         Breathing Rate (m^3 * sec^-1)
       4.6800E+02                 3.4700E-04
       4.9200E+02                 0.0000E+00

     Location Occupancy Factor Data
      Time (hr)         Occupancy Factor
       4.6800E+02            1.0000E+00
       4.9200E+02            0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
     Time            Time step
      0.0000E+00       1.0000E-03
      1.0000E-02       1.0000E-02
      1.0000E-01       1.0000E-01
      1.0000E+00       1.0000E+00
      2.4000E+01       0.0000E+00
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:51:54
#######################################################################
```

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

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

Exclusion Area Bndry Doses:

Time (h) = 468.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.2671E-08	1.4983E-05	4.8904E-07
Accumulated dose (rem)	3.2671E-08	1.4983E-05	4.8904E-07

Low Population Zone Doses:

Time (h) = 468.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.6976E-09	1.6958E-06	5.5348E-08
Accumulated dose (rem)	3.6976E-09	1.6958E-06	5.5348E-08

Control Room Doses:

Time (h) = 468.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.8995E-14	3.5383E-10	1.0816E-11
Accumulated dose (rem)	3.8995E-14	3.5383E-10	1.0816E-11

Containment Compartment Nuclide Inventory:

Time (h) = 468.0000	Ci	kg	Atoms	Decay
Kr-85	6.0801E+02	1.5497E-03	1.0980E+22	8.0987E+10
I-131	3.1332E+01	2.5273E-07	1.1618E+18	4.1734E+09
I-132	2.4332E+00	2.3572E-10	1.0754E+15	3.2410E+08
I-133	3.6202E-05	3.1958E-14	1.4470E+11	4.8221E+03
Xe-133	3.8528E+03	2.0583E-05	9.3199E+19	5.1319E+11

Containment Transport Group Inventory:

Time (h) = 468.0000	Atmosphere	Sump	
Noble gases (atoms)	1.1073E+22	0.0000E+00	
Elemental I (atoms)	5.5236E+16	0.0000E+00	
Organic I (atoms)	2.9072E+15	0.0000E+00	
Aerosols (kg)	2.4031E-07	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.1070E-05
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.1096E-05
Total I (Ci)			3.3765E+01

Leak to Environment Transport Group Inventory:

Time (h) = 468.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.3218E+16
Elemental I (atoms)	0.0000E+00	1.6571E+11
Organic I (atoms)	0.0000E+00	8.7215E+09
Aerosols (kg)	0.0000E+00	7.2094E-13

Environment Integral Nuclide Release:

Time (h) = 468.0000	Ci	kg	Atoms	Bq
Kr-85	1.8240E-03	4.6492E-09	3.2939E+16	6.7489E+07
I-131	9.3995E-05	7.5818E-13	3.4854E+12	3.4778E+06
I-132	7.2995E-06	7.0717E-16	3.2263E+09	2.7008E+05
I-133	1.0861E-10	9.5874E-20	4.3411E+05	4.0185E+00
Xe-133	1.1558E-02	6.1749E-11	2.7960E+14	4.2766E+08

Environment Transport Group Inventory:

Time (h) = 468.0000	Total Release	Release Rate/s
Noble gases (atoms)	3.3218E+16	9.2273E+18
Elemental I (atoms)	1.6571E+11	4.6030E+13
Organic I (atoms)	8.7215E+09	2.4226E+12
Aerosols (kg)	7.2094E-13	2.0026E-10
Dose Effective (Ci) I-131 (Thyroid)		9.4038E-05
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		9.4258E-05
Total I (Ci)		1.0129E-04

Leak to Environment Transport Group Inventory:

Time (h) = 468.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.3218E+16
Elemental I (atoms)	0.0000E+00	1.6571E+11
Organic I (atoms)	0.0000E+00	8.7215E+09
Aerosols (kg)	0.0000E+00	7.2094E-13

Environment to Control Room Transport Group Inventory:

Time (h) = 468.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.2308E+14
Elemental I (atoms)	0.0000E+00	4.6048E+09
Organic I (atoms)	0.0000E+00	2.4236E+08
Aerosols (kg)	0.0000E+00	2.0034E-14

Control Room to Environment Exhaust Transport Group Inventory:

Time (h) = 468.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.8252E+08	0.0000E+00
Elemental I (atoms)	2.4070E+03	0.0000E+00
Organic I (atoms)	1.2669E+02	0.0000E+00
Aerosols (kg)	1.0472E-20	0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) = 468.0000	Ci	kg	Atoms	Decay
Kr-85	5.0687E-05	1.2919E-10	9.1531E+14	6.7514E+03
I-131	2.6120E-06	2.1068E-14	9.6853E+10	3.4791E+02
I-132	2.0284E-07	1.9651E-17	8.9652E+07	2.7018E+01
I-133	3.0180E-12	2.6642E-21	1.2063E+04	4.0200E-04
Xe-133	3.2119E-04	1.7159E-12	7.7695E+12	4.2782E+04

Control Room Transport Group Inventory:

Time (h) = 468.0000	Atmosphere	Sump	
Noble gases (atoms)	9.2308E+14	0.0000E+00	
Elemental I (atoms)	4.6048E+09	0.0000E+00	
Organic I (atoms)	2.4236E+08	0.0000E+00	
Aerosols (kg)	2.0034E-14	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.2433E-16
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.2556E-16
Total I (Ci)			2.8148E-06

Environment to Control Room Transport Group Inventory:

	Pathway	
Time (h) = 468.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.2308E+14
Elemental I (atoms)	0.0000E+00	4.6048E+09
Organic I (atoms)	0.0000E+00	2.4236E+08
Aerosols (kg)	0.0000E+00	2.0034E-14

Control Room to Environment Exhaust Transport Group Inventory:

	Pathway	
Time (h) = 468.0000	Filtered	Transported
Noble gases (atoms)	4.8252E+08	0.0000E+00
Elemental I (atoms)	2.4070E+03	0.0000E+00
Organic I (atoms)	1.2669E+02	0.0000E+00
Aerosols (kg)	1.0472E-20	0.0000E+00

Exclusion Area Bndry Doses:

Time (h) = 492.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0865E-02	4.9918E+00	1.6290E-01
Accumulated dose (rem)	1.0865E-02	4.9918E+00	1.6291E-01

Low Population Zone Doses:

Time (h) = 492.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2296E-03	5.6495E-01	1.8437E-02
Accumulated dose (rem)	1.2296E-03	5.6496E-01	1.8437E-02

Control Room Doses:

Time (h) = 492.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6344E-02	1.4958E+02	4.5720E+00
Accumulated dose (rem)	1.6344E-02	1.4958E+02	4.5720E+00

Containment Compartment Nuclide Inventory:

Time (h) = 492.0000	Ci	kg	Atoms	Decay

Containment Transport Group Inventory:

Time (h) = 492.0000	Atmosphere	Sump

Noble gases (atoms)	3.2013E-41	0.0000E+00
Elemental I (atoms)	1.4655E-46	0.0000E+00
Organic I (atoms)	7.7130E-48	0.0000E+00
Aerosols (kg)	6.3757E-70	0.0000E+00

Dose Effective (Ci/cc)	I-131 (Thyroid)	2.9383E-68
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)	2.9383E-68
Total I (Ci)		8.3207E-62

Leak to Environment Transport Group Inventory:

Time (h) = 492.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1057E+22
Elemental I (atoms)	0.0000E+00	5.5126E+16
Organic I (atoms)	0.0000E+00	2.9014E+15
Aerosols (kg)	0.0000E+00	2.3983E-07

Environment Integral Nuclide Release:

Time (h) = 492.0000	Ci	kg	Atoms	Bq
Kr-85	6.0801E+02	1.5497E-03	1.0980E+22	2.2496E+13
I-131	3.1310E+01	2.5255E-07	1.1610E+18	1.1585E+12
I-132	2.2971E+00	2.2254E-10	1.0153E+15	8.4991E+10
I-133	3.5967E-05	3.1751E-14	1.4376E+11	1.3308E+06
Xe-133	3.8486E+03	2.0561E-05	9.3098E+19	1.4240E+14
Xe-135	3.3897E-11	1.3273E-20	5.9210E+04	1.2542E+00

Environment Transport Group Inventory:

Time (h) = 492.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1073E+22	1.2816E+17
Elemental I (atoms)	5.5195E+16	6.3883E+11
Organic I (atoms)	2.9050E+15	3.3622E+10
Aerosols (kg)	2.4013E-07	2.7793E-12

Dose Effective (Ci)	I-131 (Thyroid)	3.1323E+01
Dose Effective (Ci)	I-131 (ICRP2 Thyroid)	3.1392E+01
Total I (Ci)		3.3607E+01

Leak to Environment Transport Group Inventory:

Time (h) = 492.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1057E+22
Elemental I (atoms)	0.0000E+00	5.5126E+16
Organic I (atoms)	0.0000E+00	2.9014E+15
Aerosols (kg)	0.0000E+00	2.3983E-07

Environment to Control Room Transport Group Inventory:

Time (h) = 492.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0769E+20
Elemental I (atoms)	0.0000E+00	1.5341E+15
Organic I (atoms)	0.0000E+00	8.0741E+13
Aerosols (kg)	0.0000E+00	6.6742E-09

Control Room to Environment Exhaust Transport Group Inventory:

	Pathway	
Time (h) = 492.0000	Filtered	Transported
Noble gases (atoms)	3.0782E+20	0.0000E+00
Elemental I (atoms)	1.5312E+15	0.0000E+00
Organic I (atoms)	8.0589E+13	0.0000E+00
Aerosols (kg)	6.6616E-09	0.0000E+00

Control Room Compartment Nuclide Inventory:

Time (h) = 492.0000	Ci	kg	Atoms	Decay
Kr-85	1.0328E-15	2.6324E-21	1.8650E+04	1.3844E+15

Control Room Transport Group Inventory:

Time (h) = 492.0000	Atmosphere	Sump	
Noble gases (atoms)	1.8789E+04	0.0000E+00	
Elemental I (atoms)	8.6010E-02	0.0000E+00	
Organic I (atoms)	4.5268E-03	0.0000E+00	
Aerosols (kg)	3.7420E-25	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		9.7983E-27
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.7983E-27
Total I (Ci)			4.8835E-17

Environment to Control Room Transport Group Inventory:

	Pathway	
Time (h) = 492.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0769E+20
Elemental I (atoms)	0.0000E+00	1.5341E+15
Organic I (atoms)	0.0000E+00	8.0741E+13
Aerosols (kg)	0.0000E+00	6.6742E-09

Control Room to Environment Exhaust Transport Group Inventory:

	Pathway	
Time (h) = 492.0000	Filtered	Transported
Noble gases (atoms)	3.0782E+20	0.0000E+00
Elemental I (atoms)	1.5312E+15	0.0000E+00
Organic I (atoms)	8.0589E+13	0.0000E+00
Aerosols (kg)	6.6616E-09	0.0000E+00

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#################################################################
                          I-131 Summary
#################################################################
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Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
468.000	3.1332E+01	9.3995E-05	2.6120E-06
468.400	2.8383E+00	2.8474E+01	5.2181E-01
468.700	4.6866E-01	3.0841E+01	3.7464E-01
469.000	7.7385E-02	3.1232E+01	2.4188E-01
469.300	1.2778E-02	3.1297E+01	1.5228E-01
469.600	2.1099E-03	3.1308E+01	9.5252E-02
469.900	3.4839E-04	3.1309E+01	5.9478E-02
470.200	5.7526E-05	3.1310E+01	3.7123E-02
470.500	9.4988E-06	3.1310E+01	2.3167E-02
470.800	1.5684E-06	3.1310E+01	1.4458E-02
471.100	2.5898E-07	3.1310E+01	9.0222E-03

471.400	4.2763E-08	3.1310E+01	5.6303E-03
471.700	7.0611E-09	3.1310E+01	3.5136E-03
472.000	1.1659E-09	3.1310E+01	2.1926E-03
472.300	1.9252E-10	3.1310E+01	1.3683E-03
472.600	3.1789E-11	3.1310E+01	8.5388E-04
472.900	5.2491E-12	3.1310E+01	5.3286E-04
473.200	8.6673E-13	3.1310E+01	3.3253E-04
473.500	1.4312E-13	3.1310E+01	2.0751E-04
473.800	2.3631E-14	3.1310E+01	1.2950E-04
474.100	3.9020E-15	3.1310E+01	8.0812E-05
474.400	6.4431E-16	3.1310E+01	5.0430E-05
474.700	1.0639E-16	3.1310E+01	3.1471E-05
475.000	1.7567E-17	3.1310E+01	1.9639E-05
475.300	2.9007E-18	3.1310E+01	1.2256E-05
475.600	4.7896E-19	3.1310E+01	7.6482E-06
475.900	7.9086E-20	3.1310E+01	4.7728E-06
476.200	1.3059E-20	3.1310E+01	2.9784E-06
476.500	2.1563E-21	3.1310E+01	1.8587E-06
476.800	3.5605E-22	3.1310E+01	1.1599E-06
477.100	5.8791E-23	3.1310E+01	7.2383E-07
477.400	9.7076E-24	3.1310E+01	4.5170E-07
477.700	1.6029E-24	3.1310E+01	2.8188E-07
478.000	2.6468E-25	3.1310E+01	1.7591E-07
478.300	4.3704E-26	3.1310E+01	1.0977E-07
492.000	8.3202E-62	3.1310E+01	4.8832E-17

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#####################################################################
                    Cumulative Dose Summary
#####################################################################
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	Exclusion Area Bndry		Low Population Zone		Control Room	
Time (hr)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)
468.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
468.400	4.5396E+00	1.4815E-01	5.1378E-01	1.6767E-02	4.5962E+01	1.4049E+00
468.700	4.9171E+00	1.6047E-01	5.5650E-01	1.8161E-02	8.2642E+01	2.5261E+00
469.000	4.9795E+00	1.6250E-01	5.6356E-01	1.8392E-02	1.0743E+02	3.2838E+00
469.300	4.9898E+00	1.6284E-01	5.6472E-01	1.8430E-02	1.2322E+02	3.7663E+00
469.600	4.9915E+00	1.6289E-01	5.6492E-01	1.8436E-02	1.3312E+02	4.0689E+00
469.900	4.9918E+00	1.6290E-01	5.6495E-01	1.8437E-02	1.3931E+02	4.2580E+00
470.200	4.9918E+00	1.6290E-01	5.6495E-01	1.8437E-02	1.4317E+02	4.3760E+00
470.500	4.9918E+00	1.6291E-01	5.6495E-01	1.8437E-02	1.4558E+02	4.4497E+00
470.800	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4708E+02	4.4957E+00
471.100	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4802E+02	4.5243E+00
471.400	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4861E+02	4.5422E+00
471.700	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4897E+02	4.5534E+00
472.000	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4920E+02	4.5604E+00
472.300	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4934E+02	4.5647E+00
472.600	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4943E+02	4.5674E+00
472.900	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4949E+02	4.5691E+00
473.200	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4952E+02	4.5702E+00
473.500	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4954E+02	4.5709E+00
473.800	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4956E+02	4.5713E+00
474.100	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4957E+02	4.5715E+00
474.400	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4957E+02	4.5717E+00
474.700	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4957E+02	4.5718E+00
475.000	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5718E+00
475.300	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
475.600	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00

475.900	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
476.200	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
476.500	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
476.800	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
477.100	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5719E+00
477.400	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5720E+00
477.700	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5720E+00
478.000	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5720E+00
478.300	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5720E+00
492.000	4.9918E+00	1.6291E-01	5.6496E-01	1.8437E-02	1.4958E+02	4.5720E+00

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#################################################################
                        Worst Two-Hour Doses
#################################################################
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Exclusion Area Bndry

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
468.0	1.0865E-02	4.9918E+00	1.6290E-01

```
 ######################################################################
    RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:42:42
 ######################################################################

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

 Plant file           = F:\PBAPS FHA 84hr Delay -  CR Filter Credit - Worst
Hatch.psf
 Inventory file       = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast source
terms for fha.nif
 Release file         = p:\users\nuc\exelon eoc\discipline
files\process\ast\peach bottom ast\pbaps fha\radtrad\peach bottom ast fha.rft
 Dose Conversion file = c:\program files\radtrad3.03\defaults\fgr11&12.inp
```

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

```
 Radtrad 3.03 4/15/2001
 PBAPS FHA - TB/RB Ventilation Stack to CR Intake, EAB, & LPZ - 84 Hour Delay and
CR Filtration Credit
 Nuclide Inventory File:
 p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast source terms for fha.nif
 Plant Power Level:
  1.5460E+01
 Compartments:
   3
 Compartment 1:
 Containment
   3
  1.0000E+02
   0
   0
   0
   0
   0
 Compartment 2:
 Environment
   2
  0.0000E+00
   0
   0
   0
   0
   0
```

```
Compartment 3:
Control Room
  1
 1.7600E+05
  0
  0
  0
  0
  0
Pathways:
  4
Pathway 1:
Leak to Environment
  1
  2
  2
Pathway 2:
Environment to  Control Room, Filtered
  2
  3
  2
Pathway 3:
Control Room to  Environment Exhaust
  3
  2
  2
Pathway 4:
Environment to  Control Room - Unfiltered Inleakage
  2
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:
ACCEPT\TEST1.PMF
Source Term:
  1
  1   1.0000E+00
c:\program files\radtrad3.03\defaults\fgr11&12.inp
p:\users\nuc\exelon eoc\discipline files\process\ast\peach bottom ast\pbaps
fha\radtrad\peach bottom ast fha.rft
  8.4000E+01
  1
  0.0000E+00   1.0000E+00   0.0000E+00   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
  0
  0
  0
Pathways:
  4
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  8.4000E+01   1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
  1.0800E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  8.4000E+01   2.7000E+03   9.9000E+01   9.0000E+01   9.0000E+01
  1.0800E+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
  2
  8.4000E+01   3.2000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.0800E+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
  2
  8.4000E+01   5.0000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.0800E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
Exclusion Area Bndry
  2
  1
  2
  8.4000E+01   4.2500E-04
  1.0800E+02   0.0000E+00
  1
  2
  8.4000E+01   3.4700E-04
  1.0800E+02   0.0000E+00
  0
Location 2:
Low Population Zone
  2
  1
  2
  8.4000E+01   4.8100E-05
  1.0800E+02   0.0000E+00
  1
  2
  8.4000E+01   3.4700E-04
  1.0800E+02   0.0000E+00
  0
Location 3:
```

```
Control Room
  3
  0
  1
  2
  8.4000E+01   3.4700E-04
  8.0400E+02   0.0000E+00
  1
  4
  8.4000E+01   1.0000E+00
  1.0800E+02   6.0000E-01
  1.8000E+02   4.0000E-01
  8.0400E+02   0.0000E+00
Effective Volume Location:
  1
  2
  8.4000E+01   1.2800E-02
  1.0800E+02   0.0000E+00
Simulation Parameters:
  5
  8.4000E+01   1.0000E-03
  8.4010E+01   1.0000E-02
  8.4100E+01   1.0000E-01
  8.5000E+01   1.0000E+00
  1.0800E+02   0.0000E+00
Output Filename:
F:\PBAPS FHA 84hr Delay - CR Filter Credit - Worst Hatch.o0
  1
  1
  1
  0
  0
End of Scenario File
```

CASE 6: PBAPS FHA 84hr Delay - CR Filter Credit – Worst Hatch.o0

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:42:42
#######################################################################

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

Number of Nuclides =  60

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   1.5460E+01 MWth

Number of compartments    =   3

Compartment information

Compartment number  1  (Source term fraction =   1.0000E+00
)
Name: Containment
Compartment volume =   1.0000E+02 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: Leak to Environment

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Leak to Environment
   Inlet Pathway Number   3: Control Room to  Environment Exhaust
   Exit Pathway Number    2: Environment to  Control Room, Filtered
   Exit Pathway Number    4: Environment to  Control Room - Unfiltered Inleakag

Compartment number  3
Name: Control Room
Compartment volume =   1.7600E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environment to  Control Room, Filtered
   Inlet Pathway Number   4: Environment to  Control Room - Unfiltered Inleakag
   Exit Pathway Number    3: Control Room to  Environment Exhaust

Total number of pathways =   4
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:42:42
#######################################################################

#######################################################################
                    Scenario Description
#######################################################################
```

Time between shutdown and first release = 8.4000E+01 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.000001 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	5.0000E-02	0.0000E+00	0.0000E+00	1.791E+00
IODINE	2.5000E-04	0.0000E+00	0.0000E+00	1.610E-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 = 15. MWt

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Kr-85	1	7.892E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	8.313E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.633E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	2.303E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
I-131	2	4.299E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.881E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.556E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.165E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.192E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.491E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	2.228E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00

Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00
Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Iodine fractions

Aerosol	=	0.0000E+00
Elemental	=	1.0000E+00
Organic	=	0.0000E+00

COMPARTMENT DATA

Compartment number 1: Containment

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Leak to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
8.4000E+01	1.0000E+01	0.0000E+00	0.0000E+00	0.0000E+00
1.0800E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: Environment to Control Room, Filtered

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
8.4000E+01	2.7000E+03	9.9000E+01	9.0000E+01	9.0000E+01
1.0800E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

```
Pathway number  3: Control Room to  Environment Exhaust

     Pathway Filter: Removal Data

       Time (hr)       Flow Rate          Filter Efficiencies (%)
                        (cfm)         Aerosol     Elemental    Organic
       8.4000E+01    3.2000E+03   1.0000E+02   1.0000E+02   1.0000E+02
       1.0800E+02    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

Pathway number  4: Environment to  Control Room - Unfiltered Inleakag

     Pathway Filter: Removal Data

       Time (hr)       Flow Rate          Filter Efficiencies (%)
                        (cfm)         Aerosol     Elemental    Organic
       8.4000E+01    5.0000E+02   0.0000E+00   0.0000E+00   0.0000E+00
       1.0800E+02    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

LOCATION DATA
     Location Exclusion Area Bndry     is in compartment   2

     Location X/Q Data
      Time (hr)          X/Q (s * m^-3)
       8.4000E+01           4.2500E-04
       1.0800E+02           0.0000E+00

     Location Breathing Rate Data
      Time (hr)          Breathing Rate (m^3 * sec^-1)
       8.4000E+01                 3.4700E-04
       1.0800E+02                 0.0000E+00
     Location Low Population Zone     is in compartment   2

     Location X/Q Data
      Time (hr)          X/Q (s * m^-3)
       8.4000E+01           4.8100E-05
       1.0800E+02           0.0000E+00

     Location Breathing Rate Data
      Time (hr)          Breathing Rate (m^3 * sec^-1)
       8.4000E+01                 3.4700E-04
       1.0800E+02                 0.0000E+00
     Location Control Room     is in compartment   3

     Location X/Q Data
      Time (hr)          X/Q (s * m^-3)
       8.4000E+01           1.2800E-02
       1.0800E+02           0.0000E+00

     Location Breathing Rate Data
      Time (hr)          Breathing Rate (m^3 * sec^-1)
       8.4000E+01                 3.4700E-04
       8.0400E+02                 0.0000E+00

     Location Occupancy Factor Data
      Time (hr)          Occupancy Factor
       8.4000E+01            1.0000E+00
       1.0800E+02            6.0000E-01
       1.8000E+02            4.0000E-01
```

```
      8.0400E+02            0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
     Time              Time step
      0.0000E+00         1.0000E-03
      1.0000E-02         1.0000E-02
      1.0000E-01         1.0000E-01
      1.0000E+00         1.0000E+00
      2.4000E+01         0.0000E+00
```

```
#######################################################################
   RADTRAD Version 3.03 (Spring 2001) run on 12/13/2004  at 12:42:42
#######################################################################
```

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

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

Exclusion Area Bndry Doses:

Time (h) = 84.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.9201E-07	6.0595E-05	2.1450E-06
Accumulated dose (rem)	2.9201E-07	6.0595E-05	2.1450E-06

Low Population Zone Doses:

Time (h) = 84.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3048E-08	6.8579E-06	2.4276E-07
Accumulated dose (rem)	3.3048E-08	6.8579E-06	2.4276E-07

Control Room Doses:

Time (h) = 84.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.1021E-13	2.3953E-10	7.5349E-12
Accumulated dose (rem)	2.1021E-13	2.3953E-10	7.5349E-12

Exclusion Area Bndry Doses:

Time (h) = 108.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.6719E-02	2.0184E+01	7.1385E-01
Accumulated dose (rem)	9.6719E-02	2.0184E+01	7.1386E-01

Low Population Zone Doses:

Time (h) = 108.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0946E-02	2.2843E+00	8.0791E-02
Accumulated dose (rem)	1.0946E-02	2.2844E+00	8.0792E-02

Control Room Doses:

Time (h) = 108.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2596E-01	1.4526E+02	4.5645E+00
Accumulated dose (rem)	1.2596E-01	1.4526E+02	4.5645E+00

Exclusion Area Bndry Doses:

Time (h) = 180.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	9.6719E-02	2.0184E+01	7.1386E-01

Low Population Zone Doses:

Time (h) = 180.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	1.0946E-02	2.2844E+00	8.0792E-02

Control Room Doses:

Time (h) = 180.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.1227E-11	2.8592E-08	8.9195E-10
Accumulated dose (rem)	1.2596E-01	1.4526E+02	4.5645E+00

Exclusion Area Bndry Doses:

Time (h) = 804.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	9.6719E-02	2.0184E+01	7.1386E-01

Low Population Zone Doses:

Time (h) = 804.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	1.0946E-02	2.2844E+00	8.0792E-02

Control Room Doses:

Time (h) = 804.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8458E-11	5.7507E-08	1.7793E-09
Accumulated dose (rem)	1.2596E-01	1.4526E+02	4.5645E+00

856

##
I-131 Summary
##

Time (hr)	Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
84.000	1.2416E+02	3.7247E-04	1.7326E-06
84.400	1.1247E+01	1.1283E+02	3.9166E-01
84.700	1.8571E+00	1.2221E+02	3.1752E-01
85.000	3.0665E-01	1.2376E+02	2.3451E-01
85.300	5.0635E-02	1.2402E+02	1.6984E-01
85.600	8.3608E-03	1.2406E+02	1.2246E-01
85.900	1.3805E-03	1.2407E+02	8.8214E-02
86.200	2.2796E-04	1.2407E+02	6.3528E-02
86.500	3.7641E-05	1.2407E+02	4.5748E-02
86.800	6.2152E-06	1.2407E+02	3.2944E-02
87.100	1.0263E-06	1.2407E+02	2.3723E-02
87.400	1.6946E-07	1.2407E+02	1.7083E-02
87.700	2.7981E-08	1.2407E+02	1.2302E-02
88.000	4.6202E-09	1.2407E+02	8.8588E-03
88.300	7.6290E-10	1.2407E+02	6.3793E-03
88.600	1.2597E-10	1.2407E+02	4.5938E-03

88.900	2.0800E-11	1.2407E+02	3.3080E-03
89.200	3.4346E-12	1.2407E+02	2.3822E-03
89.500	5.6712E-13	1.2407E+02	1.7154E-03
89.800	9.3643E-14	1.2407E+02	1.2353E-03
90.100	1.5462E-14	1.2407E+02	8.8954E-04
90.400	2.5532E-15	1.2407E+02	6.4057E-04
90.700	4.2158E-16	1.2407E+02	4.6128E-04
91.000	6.9612E-17	1.2407E+02	3.3217E-04
91.300	1.1494E-17	1.2407E+02	2.3920E-04
91.600	1.8980E-18	1.2407E+02	1.7225E-04
91.900	3.1339E-19	1.2407E+02	1.2404E-04
92.200	5.1748E-20	1.2407E+02	8.9323E-05
92.500	8.5446E-21	1.2407E+02	6.4322E-05
92.800	1.4109E-21	1.2407E+02	4.6319E-05
93.100	2.3297E-22	1.2407E+02	3.3355E-05
93.400	3.8468E-23	1.2407E+02	2.4019E-05
93.700	6.3519E-24	1.2407E+02	1.7297E-05
94.000	1.0488E-24	1.2407E+02	1.2455E-05
94.300	1.7318E-25	1.2407E+02	8.9693E-06
108.000	3.2970E-61	1.2407E+02	2.7584E-12
180.000	2.5457E-61	1.2407E+02	2.1298E-12
804.000	2.7059E-62	1.2407E+02	2.2639E-13

##
Cumulative Dose Summary
##

	Exclusion Area Bndry		Low Population Zone		Control Room	
Time	Thyroid	TEDE	Thyroid	TEDE	Thyroid	TEDE
(hr)	(rem)	(rem)	(rem)	(rem)	(rem)	(rem)
84.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
84.400	1.8356E+01	6.4937E-01	2.0775E+00	7.3493E-02	3.3251E+01	1.0457E+00
84.700	1.9882E+01	7.0323E-01	2.2502E+00	7.9589E-02	6.2949E+01	1.9794E+00
85.000	2.0134E+01	7.1210E-01	2.2787E+00	8.0593E-02	8.5731E+01	2.6953E+00
85.300	2.0176E+01	7.1357E-01	2.2834E+00	8.0759E-02	1.0236E+02	3.2178E+00
85.600	2.0183E+01	7.1381E-01	2.2842E+00	8.0786E-02	1.1437E+02	3.5950E+00
85.900	2.0184E+01	7.1385E-01	2.2843E+00	8.0791E-02	1.2302E+02	3.8667E+00
86.200	2.0184E+01	7.1385E-01	2.2844E+00	8.0792E-02	1.2925E+02	4.0622E+00
86.500	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.3374E+02	4.2029E+00
86.800	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.3697E+02	4.3042E+00
87.100	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.3929E+02	4.3772E+00
87.400	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4096E+02	4.4296E+00
87.700	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4217E+02	4.4674E+00
88.000	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4303E+02	4.4946E+00
88.300	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4366E+02	4.5142E+00
88.600	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4411E+02	4.5283E+00
88.900	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4443E+02	4.5384E+00
89.200	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4467E+02	4.5457E+00
89.500	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4483E+02	4.5510E+00
89.800	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4495E+02	4.5548E+00
90.100	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4504E+02	4.5575E+00
90.400	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4510E+02	4.5594E+00
90.700	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4515E+02	4.5609E+00
91.000	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4518E+02	4.5619E+00
91.300	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4520E+02	4.5626E+00
91.600	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4522E+02	4.5631E+00
91.900	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4523E+02	4.5635E+00
92.200	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4524E+02	4.5638E+00
92.500	2.0184E+01	7.1386E-01	2.2844E+00	8.0792E-02	1.4525E+02	4.5640E+00

```
  92.800 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4525E+02 4.5641E+00
  93.100 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5642E+00
  93.400 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5643E+00
  93.700 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5643E+00
  94.000 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5644E+00
  94.300 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5644E+00
 108.000 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5645E+00
 180.000 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5645E+00
 804.000 2.0184E+01 7.1386E-01 2.2844E+00 8.0792E-02 1.4526E+02 4.5645E+00

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

Exclusion Area Bndry
   Time    Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
   84.0   9.6719E-02   2.0184E+01   7.1385E-01
```

```
Nuclide Inventory Name:  Source Terms per this calculation
 Peach Bottom (PBAPS) FHA AST - in Ci/MW
 Power Level:
  0.1000E+01
 Nuclides:
  60
 Nuclide 001:
 Co-58
   7
  0.6117120000E+07
  0.5800E+02
  0.1529E+03
 none     0.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 002:
 Co-60
   7
  0.1663401096E+09
  0.6000E+02
  0.1830E+03
 none     0.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 003:
 Kr-85
   1
  0.3382974720E+09
  0.8500E+02
  0.7892E+03                    2.0*LOCA Value for FHA
 none     0.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 004:
 Kr-85m
   1
  0.1612800000E+05
  0.8500E+02
  0.8313E+04
 Kr-85    0.2100E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 005:
 Kr-87
   1
  0.4578000000E+04
  0.8700E+02
  0.1633E+05
 Rb-87    0.1000E+01
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 006:
 Kr-88
   1
  0.1022400000E+05
  0.8800E+02
  0.2303E+05
 Rb-88    0.1000E+01
 none     0.0000E+00
```

```
none      0.0000E+00
Nuclide 007:
Rb-86
  3
 0.1612224000E+07
 0.8600E+02
 0.6518E+02
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 008:
Sr-89
  5
 0.4363200000E+07
 0.8900E+02
 0.2798E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 009:
Sr-90
  5
 0.9189573120E+09
 0.9000E+02
 0.3178E+04
Y-90      0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 010:
Sr-91
  5
 0.3420000000E+05
 0.9100E+02
 0.3801E+05
Y-91m     0.5800E+00
Y-91      0.4200E+00
none      0.0000E+00
Nuclide 011:
Sr-92
  5
 0.9756000000E+04
 0.9200E+02
 0.4017E+05
Y-92      0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 012:
Y-90
  9
 0.2304000000E+06
 0.9000E+02
 0.3272E+04
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 013:
Y-91
  9
 0.5055264000E+07
```

```
 0.9100E+02
 0.3448E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 014:
Y-92
  9
 0.1274400000E+05
 0.9200E+02
 0.4029E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 015:
Y-93
  9
 0.3636000000E+05
 0.9300E+02
 0.4526E+05
Zr-93     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 016:
Zr-95
  9
 0.5527872000E+07
 0.9500E+02
 0.4489E+05
Nb-95m    0.7000E-02
Nb-95     0.9900E+00
none      0.0000E+00
Nuclide 017:
Zr-97
  9
 0.6084000000E+05
 0.9700E+02
 0.4657E+05
Nb-97m    0.9500E+00
Nb-97     0.5300E-01
none      0.0000E+00
Nuclide 018:
Nb-95
  9
 0.3036960000E+07
 0.9500E+02
 0.4512E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 019:
Mo-99
  7
 0.2376000000E+06
 0.9900E+02
 0.5078+05
Tc-99m    0.8800E+00
Tc-99     0.1200E+00
none      0.0000E+00
```

```
Nuclide 020:
Tc-99m
  7
 0.2167200000E+05
 0.9900E+02
 0.4447E+05
Tc-99     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 021:
Ru-103
  7
 0.3393792000E+07
 0.1030E+03
 0.4202E+05
Rh-103m   0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 022:
Ru-105
  7
 0.1598400000E+05
 0.1050E+03
 0.2908E+05
Rh-105    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 023:
Ru-106
  7
 0.3181248000E+08
 0.1060E+03
 0.1730E+05
Rh-106    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 024:
Rh-105
  7
 0.1272960000E+06
 0.1050E+03
 0.2752E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 025:
Sb-127
  4
 0.3326400000E+06
 0.1270E+03
 0.2896E+04
Te-127m   0.1800E+00
Te-127    0.8200E+00
none      0.0000E+00
Nuclide 026:
Sb-129
  4
 0.1555200000E+05
 0.1290E+03
```

```
 0.8638E+04
Te-129m  0.2200E+00
Te-129   0.7700E+00
none     0.0000E+00
Nuclide 027:
Te-127
  4
 0.3366000000E+05
 0.1270E+03
 0.2873E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 028:
Te-127m
  4
 0.9417600000E+07
 0.1270E+03
 0.3855E+03
Te-127   0.9800E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 029:
Te-129
  4
 0.4176000000E+04
 0.1290E+03
 0.8501E+04
I-129    0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 030:
Te-129m
  4
 0.2903040000E+07
 0.1290E+03
 0.1267E+04
Te-129   0.6500E+00
I-129    0.3500E+00
none     0.0000E+00
Nuclide 031:
Te-131m
  4
 0.1080000000E+06
 0.1310E+03
 0.3869E+04
Te-131   0.2200E+00
I-131    0.7800E+00
none     0.0000E+00
Nuclide 032:
Te-132
  4
 0.2815200000E+06
 0.1320E+03
 0.3821E+05
I-132    0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 033:
```

```
I-131
  2
 0.6946560000E+06
 0.1310E+03
 0.4299E+05                    1.6*LOCA Value for FHA
Xe-131m  0.1100E-01
none     0.0000E+00
none     0.0000E+00
Nuclide 034:
I-132
  2
 0.8280000000E+04
 0.1320E+03
 0.3881E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 035:
I-133
  2
 0.7488000000E+05
 0.1330E+03
 0.5556E+05
Xe-133m  0.2900E-01
Xe-133   0.9700E+00
none     0.0000E+00
Nuclide 036:
I-134
  2
 0.3156000000E+04
 0.1340E+03
 0.6165E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 037:
I-135
  2
 0.2379600000E+05
 0.1350E+03
 0.5192E+05
Xe-135m  0.1500E+00
Xe-135   0.8500E+00
none     0.0000E+00
Nuclide 038:
Xe-133
  1
 0.4531680000E+06
 0.1330E+03
 0.5491E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 039:
Xe-135
  1
 0.3272400000E+05
 0.1350E+03
 0.2228E+05
```

```
Cs-135    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 040:
Cs-134
  3
 0.6507177120E+08
 0.1340E+03
 0.7280E+04
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 041:
Cs-136
  3
 0.1131840000E+07
 0.1360E+03
 0.2027E+04
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 042:
Cs-137
  3
 0.9467280000E+09
 0.1370E+03
 0.4538E+04
Ba-137m   0.9500E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 043:
Ba-139
  6
 0.4962000000E+04
 0.1390E+03
 0.5084E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 044:
Ba-140
  6
 0.1100736000E+07
 0.1400E+03
 0.4896E+05
La-140    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 045:
La-140
  9
 0.1449792000E+06
 0.1400E+03
 0.5019E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 046:
La-141
```

```
  9
 0.1414800000E+05
 0.1410E+03
 0.4640E+05
Ce-141    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 047:
La-142
  9
 0.5550000000E+04
 0.1420E+03
 0.4532E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 048:
Ce-141
  8
 0.2808086400E+07
 0.1410E+03
 0.4492E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 049:
Ce-143
  8
 0.1188000000E+06
 0.1430E+03
 0.4427E+05
Pr-143    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 050:
Ce-144
  8
 0.2456352000E+08
 0.1440E+03
 0.3596E+05
Pr-144m   0.1800E-01
Pr-144    0.9800E+00
none      0.0000E+00
Nuclide 051:
Pr-143
  9
 0.1171584000E+07
 0.1430E+03
 0.4293E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 052:
Nd-147
  9
 0.9486720000E+06
 0.1470E+03
 0.1838E+05
Pm-147    0.1000E+01
```

```
none      0.0000E+00
none      0.0000E+00
Nuclide 053:
Np-239
  8
 0.2034720000E+06
 0.2390E+03
 0.5397E+06
Pu-239    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 054:
Pu-238
  8
 0.2768863824E+10
 0.2380E+03
 0.1796E+03
U-234     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 055:
Pu-239
  8
 0.7594336440E+12
 0.2390E+03
 0.1200E+02
U-235     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 056:
Pu-240
  8
 0.2062920312E+12
 0.2400E+03
 0.1288E+02
U-236     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 057:
Pu-241
  8
 0.4544294400E+09
 0.2410E+03
 0.6182E+04
U-237     0.2400E-04
Am-241    0.1000E+01
none      0.0000E+00
Nuclide 058:
Am-241
  9
 0.1363919472E+11
 0.2410E+03
 0.9528E+01
Np-237    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 059:
Cm-242
  9
```

```
 0.1406592000E+08
 0.2420E+03
 0.2388E+04
Pu-238   0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 060:
Cm-244
  9
 0.5715081360E+09
 0.2440E+03
 0.2602E+03
Pu-240   0.1000E+01
none     0.0000E+00
none     0.0000E+00
End of Nuclear Inventory File
```

```
Release Fraction and Timing Name:
 Peach Bottom Atomic Power Station FHA, 10x10 bundle Nobles=I=5% & pool I
DF=200, Cs DF=infinity
 Duration (h):
  0.1000E-05  0.0000E+00  0.0000E+00  0.0000E+00
 Noble Gases:
  5.0000E-02  0.0000E+00  0.0000E+00  0.0000E+00
 Iodine:
  2.5000E-04  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
 Lanthanum:
  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
 End of Release File
```

Computer Disclosure Sheet

Discipline Nuclear

Client: Exelon Corporation
Project: Peach Bottom Atomic Power Station FHA AST

Date: December, 2004
Job No. 27450-NCS0042

Program(s) used:	Rev No.	Rev Date	Calculation Set No.: PM-1059, Rev. 2
ARCON96	1	5/1997	[X] Final [ ] Void

WGI Prequalification [X] Yes
[ ] No

Run No. All

Description: ARCON96 X/Q analysis for Control Room Habitability Assessments, based on the 10.4 to 28 meter meteorological parameters.

Analysis Description: ARCON96 calculations of X/Q are performed for releases to the Control Room Intake. Centerline X/Q values, sector X/Q values and 95% max X/Q values are computed for 0-2 hours, 2-8 hours and 8-24 hours, 1-4 day, and 4-30 days.

The attached computer output has been reviewed, the input data checked,
And the results approved for release. Input criteria for this analysis were established.

By: On: 12/2004

Run by: T. Thomas 12/10/2004

Checked by: J. Robinson 12/10/2004

Approved by: H. Rothstein 12/13/2004

Remarks: Approach and methodology utilized is the same as that described in PM-1055, Rev. 1, with the same Preparer and Checker/Reviewer as indicated above and by the signatures below:

Prepared by: Traci Thomas

Reviewed by: Jack Robinson

	A	B	C	D	E	F	G	H	I	J	K	L
1	**PBAPS Fuel Handling Accident Assessment of Limiting Event**											
2	This Attachment:											
3	[a] Evaluates water coverage for FHAs over the Reactor Well and over the Spent Fuel Pool.											
4	[b] Evaluates impact of water coverages of less than 23 feet for purposes of pool DF determination.											
5	[c] Justifies that a FHA over the Reactor Well is the limiting event.											
6												
7												
8	**Baseline R.G. 1.183 based Analysis of DFs**											
9				RG 1.183	RG 1.183							
10	Water	RG 1.183	RG 1.183	Inorganic	Organic							
11	Coverage	Inorganic	Organic	Iodine	Iodine DF	Overall						
12	(feet)	Iodine DF	Iodine DF	Fraction	Fraction	DF						
13	23	500	1	0.9985	0.0015	286.0	**Case 1: Inorganic Iodine DF Guidance Controlling**					
14	23	285.3	1	0.9985	0.0015	200.0	**Case 2: Overall DF Guidance Controlling**					
15												
16												
17	**DFs determined per Burley Paper with R.G. 1.183 Case 1 assumptions**											
18				RG 1.183	RG 1.183							
19	Water	RG 1.183	RG 1.183	Inorganic	Organic							
20	Coverage	Inorganic	Organic	Iodine	Iodine DF	Overall						
21	(feet)	Iodine DF	Iodine DF	Fraction	Fraction	DF						
22	23	500	1	0.9985	0.0015	286.0	capped at 200					
23	22.5	436.8	1	0.9985	0.0015	264.1	capped at 200					
24	22	381.6	1	0.9985	0.0015	242.9	capped at 200					
25	21.5	333.4	1	0.9985	0.0015	222.5	capped at 200					
26	21	291.3	1	0.9985	0.0015	202.9	capped at 200					
27	20.5	254.5	1	0.9985	0.0015	184.4						
28	20	222.3	1	0.9985	0.0015	166.9						
29	19.5	194.2	1	0.9985	0.0015	150.6						
30	19	169.7	1	0.9985	0.0015	135.4						
31	All water coverages are more than 21 feet. Therefore, the 200 DF is conservative for all cases.											
32												
33	**DFs determined per Burley Paper with R.G. 1.183 Case 2 assumptions**											
34				RG 1.183	RG 1.183							
35	Water	RG 1.183	RG 1.183	Inorganic	Organic							
36	Coverage	Inorganic	Organic	Iodine	Iodine DF	Overall						
37	(feet)	Iodine DF	Iodine DF	Fraction	Fraction	DF						
38	23	285.3	1	0.9985	0.0015	200.0						
39	22.5	252.3	1	0.9985	0.0015	183.2						
40	22	223.1	1	0.9985	0.0015	167.4						
41	21.5	197.3	1	0.9985	0.0015	152.4						
42	21	174.5	1	0.9985	0.0015	138.5						
43	20.5	154.3	1	0.9985	0.0015	125.5						
44	20	136.5	1	0.9985	0.0015	113.4						
45	19.5	120.7	1	0.9985	0.0015	102.3						
46	19	106.7	1	0.9985	0.0015	92.1						
47	21.181	182.4	1	0.9985	0.0015	143.4						
48	22.35233	243.3	1	0.9985	0.0015	178.5						
49	Overall DF weighted by in rack vs. drop assemblies:					**160.7**						
50			For Case 2, overall % of 200 DF			80.3%						
51												
52	Fuel failure over SFP vs. over the reactor well.					70%						
53	based on recent Fermi 2 assessments of a 6 foot drop (and a similar Mark 1 configuration).											
54	Therefore, the drop over the reactor well is bounding when a DF of 200 is used.											

	A	B	C	D	E	F	G	H	I	J	K	L
1	**PBAPS Damaged Fuel Water Coverage Assessment for Fuel Handling Accidents**											
2												
3		**Reference Points**										
4	**MSL**	**Reactor 0**	**Rx. Inst. 0**	**SPF Bottom**								
5	**(feet)**	**(feet)**	**(feet)**	**(feet)**								
6	**232.542**	**84.292**	**39.458**	**37.292**	Minimum Fuel Pool Level for SPF Cooling Operation (scuppers all the way down)							
7	**232.250**	**84.000**	**39.167**	**37.000**	TS 3.7.7 Minimum Spent Fuel Pool Level for fuel movement							
8	**231.250**	**83.000**	**38.167**	**36.000**	TS 3.9.6 Minimum Water Level During Refueling							
9	**212.869**	**64.619**	**19.786**	**17.619**	Bottom of Spent Fuel Assembly at full uplift							
10	**211.069**	**62.819**	**17.985**	**15.819**	Top of Assembly Lying on Bail Handles							
11	**210.623**	**62.373**	**17.540**	**15.373**	Top of Assembly Bail Handle in Spent Fuel Pool when assembly is in racks							
12	**210.333**	**62.083**	**17.250**	**15.083**	Top of Vessel Flange							
13	**210.126**	**61.876**	**17.043**	**14.876**	Top of Assembly Upper Tie Plate in Spent Fuel Pool							
14	**209.898**	**61.648**	**16.814**	**14.648**	Top of Fuel Rod Plenum in Spent Fuel Rack							
15	**209.077**	**60.827**	**15.994**	**13.827**	Top of Active Fuel in Spent Fuel Rack							
16	**196.125**	**47.875**	**3.042**	**0.875**	Seating Surface in Racks							
17	**195.945**	**47.695**	**2.861**	**0.695**	Bottom of Assembly Seated in Racks							
18	**195.250**	**47.000**	**2.167**	**0.000**	Bottom of Spent Fuel Pool							
19	**193.083**	**44.833**	**0.000**	**-2.167**	Reactor Instrument Zero							
20	**179.969**	**31.719**	**-13.115**	**-15.281**	Fuel Channel Top Surface							
21	**148.250**	**0.000**	**-44.833**	**-47.000**	Reactor Vessel Zero							
22												
23	**21.181**	**Coverage (at TS 3.7.7 limit) over Assembly Lying on Bails (in SFP)**										
24	**23.173**	**Coverage (at TS 3.7.7 limit) over Active Fuel (in SFP)**										
25	**22.352**	**Coverage (at TS 3.7.7 limit) over Plenum Airspace (in SFP)**										
26	**32.900**	**Drop Distance over Reactor Well [Less than GESTAR 34 ft. drop assumption]**										
27	**2.743**	**Drop Distance over Spent Fuel Racks**										
28	**52.281**	**Coverage (at TS 3.7.7 limit) over Fuel Channel Top Surface (in Reactor Vessel)**										
29	**References:**											
30	**(1)**	**Fuel Assembly Dimensions (inches) Based on GE14 Fuel per GE DWG No. 107E1593, Rev. 1**										
31	176.14	Maximum Fuel Assembly Length										
32	5.96	Minimum Bail Handle Length										
33	1.065	Upper Tie Plate Thickness										
34	1.663	Scaled Box Expansion Spring Length										
35	0.015	Scaled Top clad Thickness										
36	167.437	Length from Bottom of Assembly to top of Plenum (calculated)										
37	18.55	Length from top of Bail to Top of Active Fuel (Part 2 from Table)										
38	157.59	Length from Bottom of Assembly to top of Active Fuel										
39	2.165	Distance from Bottom of assembly to estimated seating surface										
40	5.348	Assembly thickness, lying on its side										
41	**(2)**	**Drawing S-232, Rev. 5, "Reactor Building Skimmer Surge Tank Sections and Details"**										
42	**(3)**	**Drawing M-352, Sheet 2, Rev. 61, Sheet 4, Rev. 56, "P&ID Nuclear Boiler Vessel Instrumentation"**										
43	**(4)**	**Calculation ME-325, Rev. 0, "Calculate the Maximum Distance through which a Fuel Assembly Could Conceivably**										
44		**Fall at PBAPS from the Refueling Platform Grapple to Fuel Assemblies in the Reactor Vessel'**										
45	**(5)**	**Technical Specifications (TS) 3.7.7 and 3.9.6**										

	A	B	C	D	E
1	PBAPS Damaged Fuel Water				
2					
3	Reference Points				
4	MSL	Reactor 0	Rx. Inst. 0	SPF Bottom	
5	(feet)	(feet)	(feet)	(feet)	
6	=232+6.5/12	=A6+(B7-A7)	=B6+(C7-B7)	=C6+(D7-C7)	Minimum Fuel
7	=232+3/12	=A7+(B8-A8)	=B7+(C8-B8)	=C7+(D8-C8)	TS 3.7.7 Minim
8	=B8+(A10-B10)	=C8+(B10-C10)	=458/12	=C8+(D10-C10)	TS 3.9.6 Minim
9	=212+10.43/12	=A9+(B21-A21)	=B9+(C21-B21)	=C9+(D21-C21)	Bottom of Sper
10	=A11+$A40/12	=B11+$A40/12	=C11+$A40/12	=D11+$A40/12	Top of Assemb
11	=A17+$A31/12	=B17+$A31/12	=C17+$A31/12	=D17+$A31/12	Top of Assemb
12	=B12+(A21-B21)	=745/12	=B12+(C21-B21)	=C12+(D21-C21)	Top of Vessel F
13	=A14+SUM($A33:$A35)/12	=B14+SUM($A33:$A35)/12	=C14+SUM($A33:$A35)/12	=D14+SUM($A33:$A35)/12	Top of Assemb
14	=A17+$A36/12	=B17+$A36/12	=C17+$A36/12	=D17+$A36/12	Top of Fuel Ro
15	=A17+$A38/12	=B17+$A38/12	=C17+$A38/12	=D17+$A38/12	Top of Active F
16	=A18+10.5/12	=B18+10.5/12	=C18+10.5/12	=D18+10.5/12	Seating Surfac
17	=A16-$A39/12	=B16-$A39/12	=C16-$A39/12	=D16-$A39/12	Bottom of Asse
18	195.25	=A18-148.25	=B18-538/12	0	Bottom of Sper
19	=148.25+B19	=538/12	0	=-C18	Reactor Instrun
20	=380.625/12+A21	=A20+(B19-A19)	=B20+(C19-B19)	=C20+(D19-C19)	Fuel Channel T
21	148.25	0	=-538/12	=A21-A18	Reactor Vesse
22					
23	=D7-D10	Coverage (at TS 3.7.7 limit) o			
24	=D7-D15	Coverage (at TS 3.7.7 limit) o			
25	=D7-D14	Coverage (at TS 3.7.7 limit) o			
26	=A9-A20	Drop Distance over Reactor W			
27	=A9-A13	Drop Distance over Spent Fue			
28	=A7-A20	Coverage (at TS 3.7.7 limit) o			
29	References:				
30	(1)	Fuel Assembly Dimensions (ir			
31	176.14	Maximum Fuel Assembly Len			
32	5.96	Minimum Bail Handle Length			
33	1.065	Upper Tie Plate Thickness			
34	1.663	Scaled Box Expansion Spring			
35	0.015	Scaled Top clad Thickness			
36	=A31-SUM(A32:A35)	Length from Bottom of Assem			
37	18.55	Length from top of Bail to Top			
38	=A31-A37	Length from Bottom of Assem			
39	=1.51+0.655	Distance from Bottom of asse			
40	=5.226+(5.47-5.226)/2	Assembly thickness, lying on			
41	(2)	Drawing S-232, Rev. 5, "Reac			
42	(3)	Drawing M-352, Sheet 2, Rev			
43	(4)	Calculation ME-325, Rev. 0, "			
44					
45	(5)	Technical Specifications (TS)			

	A	B	C	D	E	F	G
1	PBAPS Fuel						
2	This Attachm						
3							
4							
5							
6							
7							
8	Baseline R.G						
9				RG 1.18	RG 1.18		
10	Water	RG 1.183	RG 1	Inorgan	Organic		
11	Coverage	Inorganic	Orga	Iodine	Iodine D	Overall	
12	(feet)	Iodine DF	Iodin	Fractior	Fraction	DF	
13	23	500	1	0.9985	0.0015	=1/(D13/B13+E13/C13)	Case 1: Inor
14	23	285.3	1	0.9985	0.0015	=1/(D14/B14+E14/C14)	Case 2: Ove
15							
16							
17	DFs determir						
18				RG 1.18	RG 1.18		
19	Water	RG 1.183	RG 1	Inorgan	Organic		
20	Coverage	Inorganic	Orga	Iodine	Iodine D	Overall	
21	(feet)	Iodine DF	Iodin	Fractior	Fraction	DF	
22	23	500	1	0.9985	0.0015	=1/(D22/B22+E22/C22)	capped at 20
23	=A22-0.5	=B$22^(A23/A$22)	1	0.9985	0.0015	=1/(D23/B23+E23/C23)	capped at 20
24	=A23-0.5	=B$22^(A24/A$22)	1	0.9985	0.0015	=1/(D24/B24+E24/C24)	capped at 20
25	=A24-0.5	=B$22^(A25/A$22)	1	0.9985	0.0015	=1/(D25/B25+E25/C25)	capped at 20
26	=A25-0.5	=B$22^(A26/A$22)	1	0.9985	0.0015	=1/(D26/B26+E26/C26)	capped at 20
27	=A26-0.5	=B$22^(A27/A$22)	1	0.9985	0.0015	=1/(D27/B27+E27/C27)	
28	=A27-0.5	=B$22^(A28/A$22)	1	0.9985	0.0015	=1/(D28/B28+E28/C28)	
29	=A28-0.5	=B$22^(A29/A$22)	1	0.9985	0.0015	=1/(D29/B29+E29/C29)	
30	=A29-0.5	=B$22^(A30/A$22)	1	0.9985	0.0015	=1/(D30/B30+E30/C30)	
31	All water cov						
32							
33	DFs determir						
34				RG 1.18	RG 1.18		
35	Water	RG 1.183	RG 1	Inorgan	Organic		
36	Coverage	Inorganic	Orga	Iodine	Iodine D	Overall	
37	(feet)	Iodine DF	Iodin	Fractior	Fraction	DF	
38	23	285.3	1	0.9985	0.0015	=1/(D38/B38+E38/C38)	
39	=A38-0.5	=B$38^(A39/A$38)	1	0.9985	0.0015	=1/(D39/B39+E39/C39)	
40	=A39-0.5	=B$38^(A40/A$38)	1	0.9985	0.0015	=1/(D40/B40+E40/C40)	
41	=A40-0.5	=B$38^(A41/A$38)	1	0.9985	0.0015	=1/(D41/B41+E41/C41)	
42	=A41-0.5	=B$38^(A42/A$38)	1	0.9985	0.0015	=1/(D42/B42+E42/C42)	
43	=A42-0.5	=B$38^(A43/A$38)	1	0.9985	0.0015	=1/(D43/B43+E43/C43)	
44	=A43-0.5	=B$38^(A44/A$38)	1	0.9985	0.0015	=1/(D44/B44+E44/C44)	
45	=A44-0.5	=B$38^(A45/A$38)	1	0.9985	0.0015	=1/(D45/B45+E45/C45)	
46	=A45-0.5	=B$38^(A46/A$38)	1	0.9985	0.0015	=1/(D46/B46+E46/C46)	
47	21.181	=B$38^(A47/A$38)	1	0.9985	0.0015	=1/(D47/B47+E47/C47)	
48	22.35233	=B$38^(A48/A$38)	1	0.9985	0.0015	=1/(D48/B48+E48/C48)	
49					Overall I	=(87.33*F47+(172-87.33)*F48)/172	
50					For Cas	=F49/200	
51							
52	Fuel failure c					0.7	
53	based on re						
54	Therefore, th						

ATTACHMENT G

Evaluation of Worst-Case Control Room X/Q For Release from Ground Hatches, Roof Scuttles, Personnel Access Doors and Railroad Bay Doors

1.0 Purpose/Objective

An analysis was performed for Peach Bottom Atomic Power Station Units 2 and 3 to calculate the worst-case Control Room X/Q results for releases from ground hatches, roof scuttles, reactor building personnel access doors, and railroad bay doors using the same methodology as in PM-1055 (Reference 1).

2.0 Methodology

The NRC recommended model, ARCON96 (Reference 2), is used as applied in Calculation PM-1055. The ARCON96 methodology is described in Section 2.1 of Calculation PM-1055.

3.0 Design Input

3.1 Meteorological Data

The onsite Meteorological Tower 1A data was selected as most representative for the release/intake scenarios described in Section 3.2. The 1984-1988 onsite meteorological database supplied by Exelon (Reference 3) was utilized by ARCON96. This database consists of wind measurements at 34 ft and 92 ft above tower grade and stability class derived from the delta temperature measurement between 33 and 89 ft above grade. Calculation PM-1055, Section 2.2.3 contains additional information describing the meteorological data.

3.2 Release/Intake Scenarios and Configurations

The subject releases are as follows:

- <u>Four (4) ground-level hatches</u>
  The ground-level hatches are located at the grade elevation of 135 ft mean sea level (msl) existing along the west face of the Radwaste Building. These hatch release points were conservatively selected as the closest and furthest hatch center points of each of the two sets of three contiguous ground hatches nearest the Control Room Intake.

- <u>Two (2) roof scuttles</u>
  The roof scuttles are located on the northern edge of the Unit 2 Reactor Building roof and the southern edge of the Unit 3 Reactor Building roof. Their release height is 48.5 m (i.e., 159.15 ft above the 135 ft msl grade elevation).

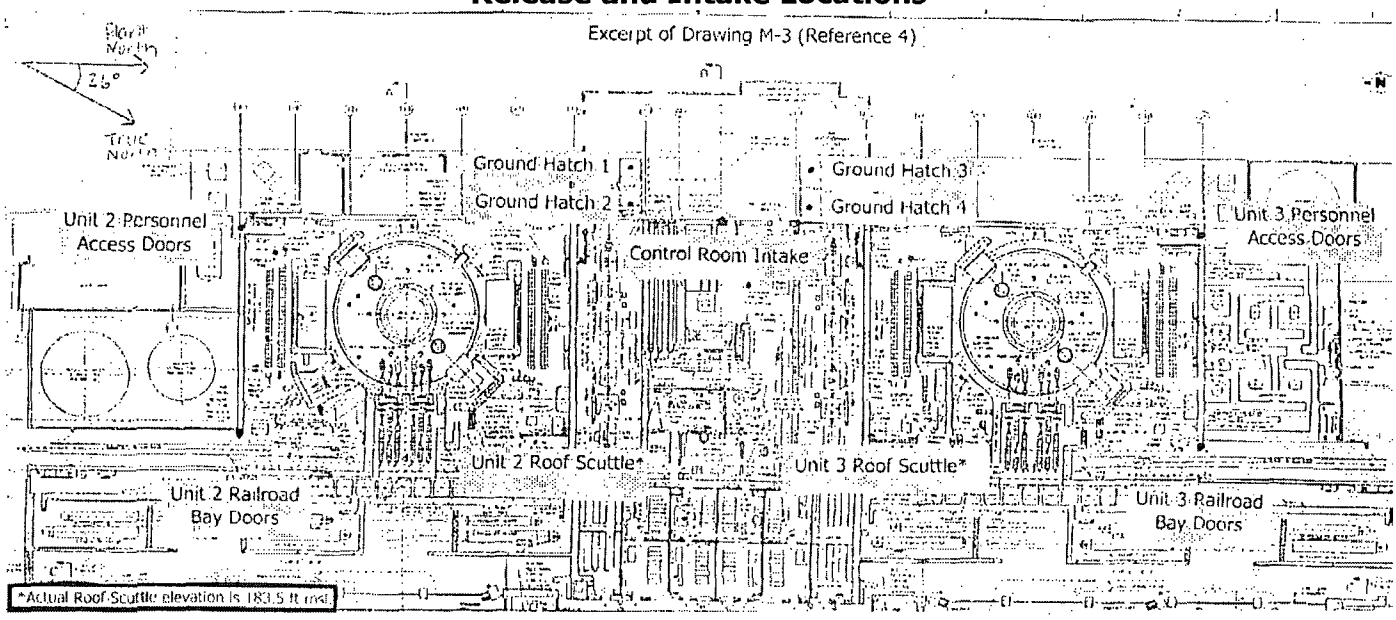
- <u>Two (2) reactor building personnel access doors</u>

The two personnel access doors have a grade-level release height (i.e. 0 ft above the 135 ft msl grade) and are located at the southwest and northwest corners of the Unit 2 and Unit 3 Reactor Buildings, respectively.

- Two (2) railroad bay doors.
  The railroad bay doors have a grade-level release height (i.e. 0 ft above the 135 ft msl grade elevation) and are located on the southern and northern face of the Unit 2 and Unit 3 Reactor Buildings, respectively.

Figure 3-1 shows the location of all subject release points.

Figure 3-1
Release and Intake Locations

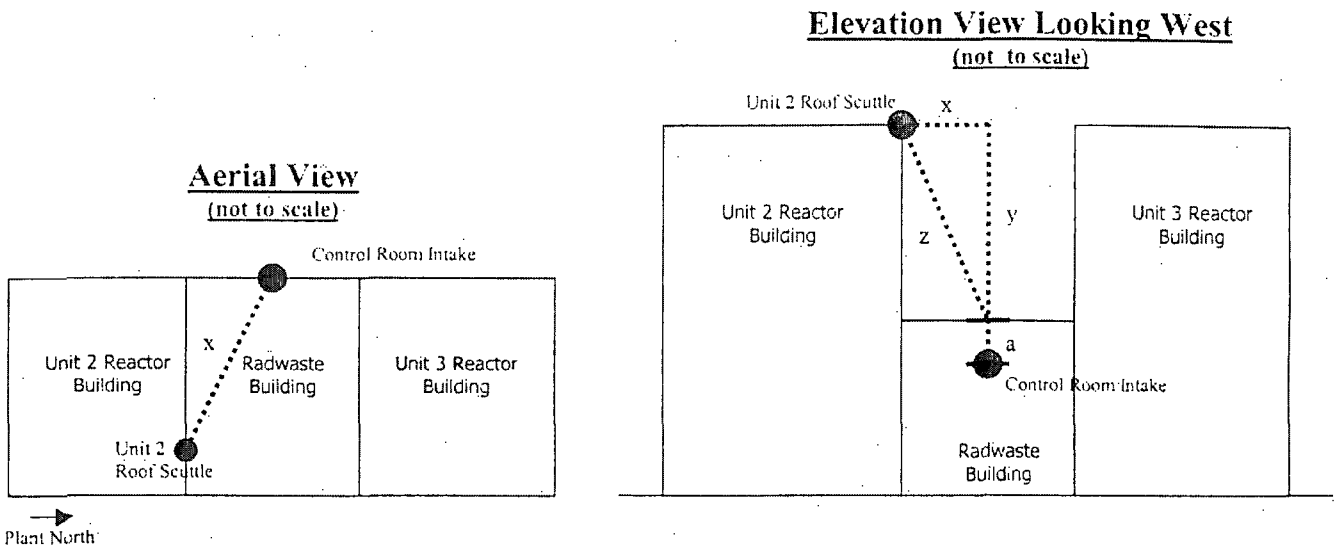


ARCON96 was executed in ground release mode for each release point to Control Room Intake scenario. The Intake, defined in Calculation PM-1055, is centered on the west face of the Radwaste Building as shown above in Figure 3-1. The vertical center of the Intake is 50 ft above the 135 ft msl west plant face grade elevation.

Input to ARCON96 requires a horizontal release/intake distance, which is defined in RG 1.194, Section 3.4, as "the shortest horizontal distance between the release point and the intake". However, for releases in building complexes, a "taut string length" can be utilized as justifiable. This taut string length was utilized for the roof scuttle, personnel access door, and railroad bay door scenarios to account for the intervening Reactor and Radwaste Buildings. Per phone conversation with Mr. Steve Lavie of NRC on May 17, 2004, when the taut string length is utilized, the intake and release height should be set equal to each other so as not to also take undue advantage of the slant distance that ARCON96 internally calculates. Therefore, the intake height was set equal to the release height above grade of

48.5 m for the roof scuttles, and 0 m for both the personnel access doors and railroad bay doors.

Figure 3-2
Taut String Length
Unit 2 Roof Scuttles*



1) Horizontal distance from Unit 2 roof scuttle to the edge of the Radwaste Building (nearest the CR Intake) = x = 130 ft (measured from Drawing A-9, Reference 5)

2) Height of the Unit 2 Reactor Building = 294 ft msl – 135 ft msl (west face grade) = 159 ft

   Height of Radwaste Building = 190 ft msl – 135 ft msl (west face grade) = 55 ft (Drawing M-5, Reference 6)

   y = 159 ft - 55 ft = 104 ft = Height difference between Unit 2 Reactor Building and Radwaste Building

3) Slant Distance, z, from the Unit 2 roof scuttle to the edge of the Radwaste Building (nearest the CR Intake):

$$z = \sqrt{x^2 + y^2}$$
$$z = \sqrt{130^2 + 104.^2}$$
$$z = \sqrt{27716}$$
$$z = 166.5\,ft$$

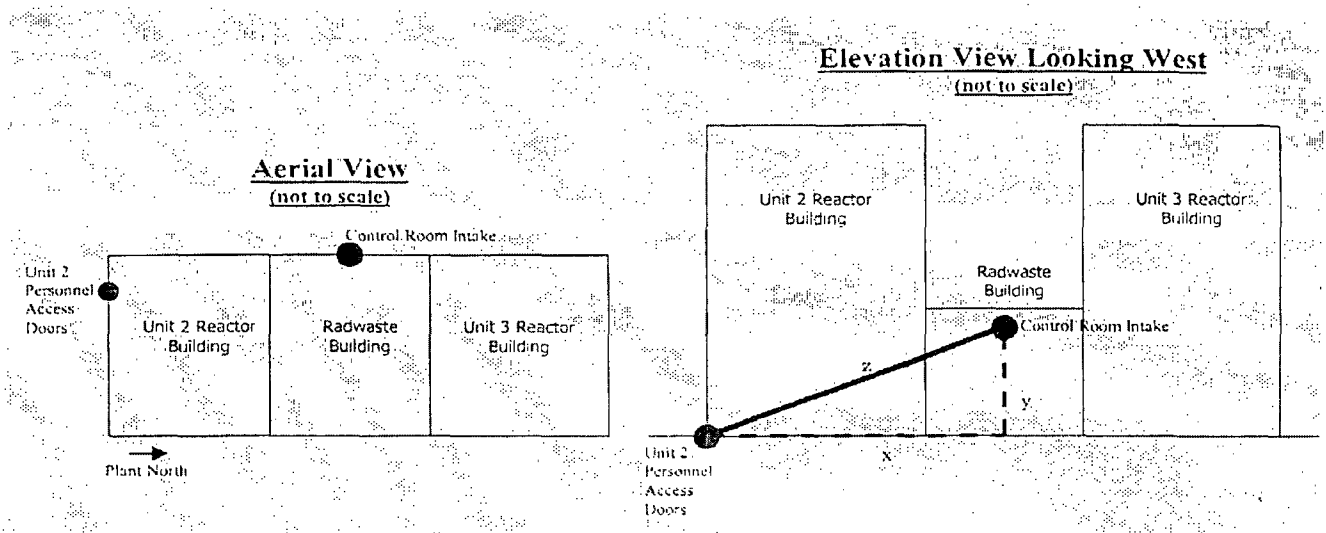
4) Vertical distance from the top of the Radwaste Building to the Control Room Intake = a = 5 ft (Drawing M-19, Reference 7)

Total taut string length = z + a = 166.5 + 5 = **171.5 ft = 52.3 m**

*Unit 3 is a mirror image of Unit 2

Figure 3-3

Taut String Length
Unit 2 Reactor Building Personnel Access Doors*



1) Horizontal distance from Unit 2 personnel access doors to southwest corner of the Unit 2 Reactor Building = 8.1 ft (measured from Drawing M-3)

2) Slant Distance, z, from the personnel access doors to the control room intake at 50 ft above west face grade of 135 ft msl (Drawing M-19):

$$z = \sqrt{x^2 + y^2}$$

$x = 223.4\ ft$ (measured from Drawing M-3)

$y = 50\ ft$

$$z = \sqrt{223.4^2 + 50^2}$$

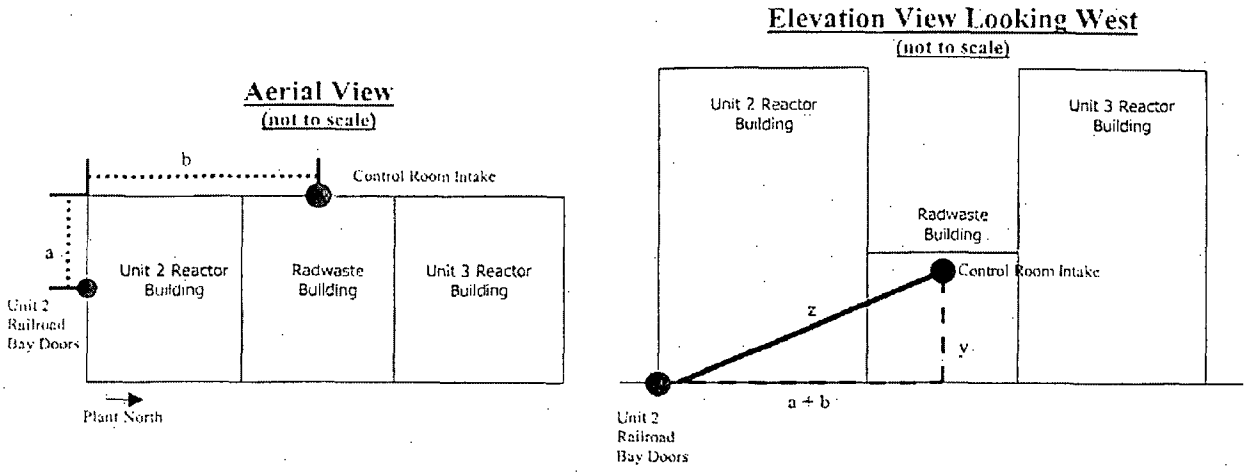
$$z = 52407.6$$

$$z = 228.9\ ft$$

Total taut string length = 8.1 ft + 228.9 ft = **237 ft**

*Unit 3 is a mirror image of Unit 2

Figure 3-4
Taut String Length
Unit 2 Railroad Bay Doors*



1) Horizontal distance from Unit 2 railroad bay doors to southwest corner of the Unit 2 Reactor Building = a = 103.6 ft (Measured from Drawing M-3)

2) Horizontal distance from the southwest corner of the Reactor building to the Control Room Intake = b = 223.4 ft (Measured from Drawing M-3)

3) Slant Distance, z, from the railroad bay doors to the control room intake height, with horizontal distance, a + b, interpreted as the effective base of triangle for calculation purposes:

$$z = \sqrt{x^2 + y^2}$$

$$x = a + b = 103.6\,ft + 223.4\,ft = 327\,ft$$

$$y = 50\,ft$$

$$z = \sqrt{327^2 + 50^2}$$

$$z = \sqrt{109429}$$

$$z = 330.8\,ft$$

Total taut string length = 330.8 ft

*Unit 3 is a mirror image of Unit 2

The smallest vertically projected area of the Reactor Building, 2583.6 m^2 (based on References 7 and 8), is utilized for each scenario. All releases are also conservatively assumed to have a zero (0) vertical velocity, exhaust flow and radius.

Table 3-1 contains a summary table of all input parameters utilized by ARCON96 and certain meteorological data statistics for each scenario. The minimum wind speed utilized in this Table is the actual site-specific value, and the surface roughness length and sector averaging constant values utilized are the ARCON96 default values. These parameters are the same as utilized previously in Reference 1. A comparison of the X/Q results for the 0-2 hour period calculated using these parameters to those calculated using 0.5 m/s minimum wind speed, 0.2 m surface roughness length, and 4.3 sector averaging constant as recommended in Table A-2 of Regulatory Guide 1.194 showed no changes in any of the calculated X/Qs.

Table 3-1
ARCON96 Control Room Intake Analysis Data Summary

	Ground Hatch 1	Ground Hatch 2	Ground Hatch 3	Ground Hatch 4	Unit 2 Roof Scuttle	Unit 3 Roof Scuttle	Unit 2 Personnel Access Door	Unit 3 Personnel Access Door	Unit 2 Railroad Bay Door	Unit 3 Railroad Bay Door
Number of meteorological data files	5	5	5	5	5	5	5	5	5	5
Height of lower wind instrument (m)	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Height of upper wind instrument (m)	28	28	28	28	28	28	28	28	28	28
Release height (m)	0	0	0	0	48.5	48.5	0	0	0	0
Building area (m^2)	2583.6	2583.6	2583.6	2583.6	2583.6	2583.6	2583.6	2583.6	2583.6	2583.6
Effluent vertical velocity (m/s)	0	0	0	0	0	0	0	0	0	0
Vent or stack flow (m^3/s)	0	0	0	0	0	0	0	0	0	0
Vent or stack radius (m)	0	0	0	0	0	0	0	0	0	0
Direction .. intake to source (deg)	185	163	303	325	96	32	152	336	129	359
Wind direction sector width (deg)	90	90	90	90	90	90	90	90	90	90
Wind direction window (deg)	140 - 230	118 - 208	258 - 348	280 - 010	051 - 141	347 - 077	107 - 197	291 - 021	084 - 174	314 - 044
Distance to intake (m)	14.8	12.8	14.8	12.8	52.3	52.3	72.2	72.2	100.8	100.8
Intake height (m)	15.24	15.24	15.24	15.24	48.5	48.5	0	0	0	0
Terrain elevation difference (m)	0	0	0	0	0	0	0	0	0	0
Minimum wind speed (m/s)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Surface roughness length (m)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sector averaging constant	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Initial value of sigma y	0	0	0	0	0	0	0	0	0	0
Initial value of sigma z	0	0	0	0	0	0	0	0	0	0
Total hours of meteorological data processed	43800	43800	43800	43800	43800	43800	43800	43800	43800	43800
Hours of missing data	464	464	464	464	464	464	464	464	464	464
Hours direction in window	4606	6243	18898	13467	11502	4381	7910	10376	10230	7225
Hours elevated plume w/ dir. in window	0	0	0	0	0	0	0	0	0	0
Hours of calm winds	384	384	384	384	432	432	385	385	385	385
Hours direction not in window or calm	38346	36709	24054	29485	31402	38523	35041	32575	32721	35726

4.0 Calculations

Table 4-1 below presents the Control Room Intake X/Q results.

Table 4-1
ARCON96 Control Room Intake X/Q Results (sec/m^3)

	0-2 hour	2-8 hour	8-24 hour	1-4 day	4-30 day
Ground Hatch 1	4.66E-03	1.99E-03	8.70E-04	6.69E-04	5.17E-04
Ground Hatch 2	7.24E-03	4.26E-03	1.80E-03	1.18E-03	8.89E-04
Ground Hatch 3	1.19E-02	1.02E-02	4.98E-03	3.55E-03	3.08E-03
Ground Hatch 4	1.28E-02	1.02E-02	4.48E-03	2.97E-03	2.66E-03
Unit 2 Roof Scuttle	1.90E-03	1.33E-03	5.96E-04	4.18E-04	3.27E-04
Unit 3 Roof Scuttle	1.30E-03	6.10E-04	3.18E-04	2.19E-04	1.54E-04
Unit 2 Personnel Access Doors	7.54E-04	5.09E-04	2.16E-04	1.46E-04	1.06E-04
Unit 3 Personnel Access Doors	1.04E-03	6.39E-04	2.72E-04	1.87E-04	1.64E-04
Unit 2 Railroad Bay Doors	4.54E-04	3.48E-04	1.53E-04	1.06E-04	7.95E-05
Unit 3 Railroad Bay Doors	4.36E-04	2.38E-04	1.07E-04	7.62E-05	5.59E-05

5.0 References

1) *Calculation of Alternative Source Term (AST) Onsite and Offsite X/Q Values,* Calculation PM-1055, Rev. 0, March 2003.

2) *Atmospheric Relative Concentrations in Building Wakes*; NUREG/CR-6331, PNNL-10521, Rev. 1; prepared by J. V. Ramsdell, Jr., C. A. Simmons, Pacific Northwest National Laboratory; prepared for U.S. Nuclear Regulatory Commission; May 1997 (Errata, July 1997).

3) Peach Bottom 1984-1988 Meteorological Tower data; provided on behalf of Exelon by Pat Brennen of MES under cover letter "PBAPS Tower 1A Meteorological Data, 1983-1992", November 13, 2002.

4) Peach Bottom Atomic Power Station Drawing No. M-3, Rev. 21; General Arrangement Plant at El. 135'-0", Sheet 1.

5) Peach Bottom Atomic Power Station Drawing No. A-9, Rev. 11, Roof Plan.

6) Peach Bottom Atomic Power Station Drawing No. M-5, Rev. 13, General Arrangement Plan at El. 195'-0".

7) Peach Bottom Atomic Power Station Drawing No. M-19, Rev. 9; Equipment Location-Reactor and Radwaste Building Unit No. 2, Sec. C-C.

8) Peach Bottom Atomic Power Station Drawing No. M-18, Rev. 11; Equipment Location-Reactor and Radwaste Building Unit No. 2, Plan at 234'.

6.0 ARCON 96 Input and Output Files

Ground Hatch 1 to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
  2583.60
    0.00
    0.00
    0.00
 185  90
   14.80
   15.24
    0.00
H1toCR.log
H1toCR.cfd
 .1
    0.20
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-02	0.	0.	0.	0.	9.120E-02	0.	0.	0.	0.	0.	0.
8.318E-02	0.	0.	0.	0.	8.318E-02	0.	0.	0.	0.	0.	0.
7.586E-02	0.	0.	0.	0.	7.586E-02	3.	0.	0.	0.	0.	0.
6.918E-02	0.	0.	0.	0.	6.918E-02	5.	0.	0.	0.	0.	0.
6.310E-02	0.	0.	0.	0.	6.310E-02	31.	0.	0.	0.	0.	0.
5.754E-02	0.	0.	0.	0.	5.754E-02	76.	2.	0.	0.	0.	0.
5.248E-02	0.	0.	0.	0.	5.248E-02	125.	5.	0.	0.	0.	0.
4.786E-02	0.	0.	0.	0.	4.786E-02	194.	15.	0.	0.	0.	0.
4.365E-02	0.	0.	0.	0.	4.365E-02	259.	38.	0.	0.	0.	0.
3.981E-02	0.	0.	0.	0.	3.981E-02	340.	69.	0.	0.	0.	0.
3.631E-02	0.	0.	0.	0.	3.631E-02	446.	103.	0.	0.	0.	0.
3.311E-02	0.	0.	0.	0.	3.311E-02	585.	155.	0.	0.	0.	0.
3.020E-02	0.	0.	0.	0.	3.020E-02	760.	207.	3.	0.	0.	0.
2.754E-02	0.	0.	0.	0.	2.754E-02	996.	273.	46.	0.	0.	0.
2.512E-02	0.	0.	0.	0.	2.512E-02	1314.	356.	60.	0.	0.	0.
2.291E-02	0.	0.	0.	0.	2.291E-02	1741.	473.	68.	0.	0.	0.
2.089E-02	0.	0.	0.	0.	2.089E-02	2215.	665.	82.	25.	0.	0.
1.905E-02	0.	0.	0.	0.	1.905E-02	2704.	903.	90.	92.	0.	0.
1.738E-02	0.	0.	0.	0.	1.738E-02	3294.	1233.	102.	140.	0.	0.
1.585E-02	0.	0.	0.	0.	1.585E-02	3979.	1680.	111.	154.	0.	0.
1.445E-02	0.	0.	0.	0.	1.445E-02	4686.	2218.	173.	164.	0.	0.
1.318E-02	1.	0.	0.	0.	1.318E-02	5444.	2827.	317.	180.	15.	0.
1.202E-02	8.	2.	1.	0.	1.202E-02	6238.	3539.	496.	208.	164.	0.
1.096E-02	19.	5.	1.	0.	1.096E-02	7016.	4372.	775.	301.	241.	0.
1.000E-02	57.	31.	10.	1.	1.000E-02	7833.	5265.	1198.	431.	313.	0.
9.120E-03	140.	68.	34.	7.	9.120E-03	8566.	6282.	1673.	712.	328.	0.
8.318E-03	241.	133.	57.	18.	8.318E-03	9307.	7291.	2505.	1144.	361.	25.
7.586E-03	370.	201.	107.	42.	7.586E-03	10105.	8474.	3343.	1823.	675.	261.
6.918E-03	574.	315.	177.	92.	6.918E-03	10985.	9593.	4562.	2600.	1064.	580.
6.310E-03	799.	455.	261.	142.	6.310E-03	11651.	10811.	6199.	3854.	2043.	1142.
5.754E-03	1072.	633.	363.	224.	5.754E-03	12218.	11908.	7896.	5700.	3234.	1828.
5.248E-03	1612.	891.	511.	292.	5.248E-03	12729.	13026.	9664.	7903.	5093.	3001.
4.786E-03	1985.	1161.	693.	389.	4.786E-03	13485.	14179.	11579.	10278.	7467.	4752.
4.365E-03	2596.	1486.	937.	520.	4.365E-03	14175.	15138.	13540.	12712.	10460.	7534.
3.981E-03	2909.	1948.	1232.	669.	3.981E-03	14813.	16139.	15455.	15205.	14037.	12543.
3.631E-03	3437.	2343.	1573.	900.	3.631E-03	15442.	17130.	17316.	17843.	17617.	17345.
3.311E-03	3648.	2679.	1954.	1180.	3.311E-03	15885.	18096.	19364.	20144.	20887.	22349.
3.020E-03	3803.	2972.	2374.	1520.	3.020E-03	16476.	19007.	21374.	22406.	23971.	26482.
2.754E-03	4854.	3785.	2962.	1942.	2.754E-03	16830.	19655.	23215.	24498.	26452.	29933.
2.512E-03	4990.	4366.	3404.	2474.	2.512E-03	17123.	20280.	25056.	26516.	28986.	32301.
2.291E-03	4990.	4792.	3795.	3009.	2.291E-03	17949.	21152.	26930.	28800.	32099.	34583.
2.089E-03	4990.	5389.	4634.	3644.	2.089E-03	18177.	21726.	28364.	30829.	34461.	36440.
1.905E-03	4990.	5676.	5109.	4259.	1.905E-03	18332.	22348.	29741.	32836.	36342.	38000.
1.738E-03	4990.	5961.	5462.	4938.	1.738E-03	18500.	22874.	30873.	34117.	37737.	39357.
1.585E-03	4990.	6206.	5817.	5546.	1.585E-03	18566.	23259.	32252.	35286.	38667.	40034.
1.445E-03	4990.	7064.	6628.	6326.	1.445E-03	18749.	23691.	33053.	36320.	39490.	40632.
1.318E-03	4990.	7153.	7173.	6920.	1.318E-03	18750.	24177.	33786.	37225.	40062.	41162.
1.202E-03	4990.	7185.	7702.	7469.	1.202E-03	18750.	24795.	34515.	37913.	40706.	41594.
1.096E-03	4990.	7185.	8340.	8390.	1.096E-03	18750.	25251.	35328.	38505.	41134.	41769.
1.000E-03	4990.	7185.	8649.	8994.	1.000E-03	18750.	25461.	35987.	38977.	41423.	41835.
9.120E-04	4990.	7185.	9121.	9532.	9.120E-04	18750.	25560.	36354.	39725.	41612.	41886.
8.318E-04	4990.	7185.	9321.	9884.	8.318E-04	18750.	25920.	37109.	39894.	41829.	41894.
7.586E-04	4990.	7185.	9444.	10284.	7.586E-04	18750.	26219.	37514.	40189.	42020.	41919.
6.918E-04	4990.	7185.	10247.	11184.	6.918E-04	18750.	26219.	37852.	40473.	42154.	41946.

6.310E-04	4990.	7185.	10359.	11852.	6.310E-04	18750.	26219.	38129.	40894.	42209.	41983.
5.754E-04	4990.	7185.	10359.	12451.	5.754E-04	18750.	26219.	38570.	41236.	42217.	41983.
5.248E-04	4990.	7185.	10359.	13118.	5.248E-04	18750.	26219.	38763.	41265.	42226.	41983.
4.786E-04	4990.	7185.	10359.	13526.	4.786E-04	18750.	26219.	39054.	41472.	42235.	41983.
4.365E-04	4990.	7185.	10359.	13780.	4.365E-04	18750.	26219.	39256.	41631.	42243.	41983.
3.981E-04	4990.	7185.	10359.	14115.	3.981E-04	18750.	26219.	39419.	41748.	42244.	41983.
3.631E-04	4990.	7185.	10359.	14899.	3.631E-04	18750.	26219.	39650.	41905.	42318.	41983.
3.311E-04	4990.	7185.	10359.	14996.	3.311E-04	18750.	26219.	39857.	42019.	42318.	41983.
3.020E-04	4990.	7185.	10359.	15023.	3.020E-04	18750.	26219.	39992.	42039.	42318.	41983.
2.754E-04	4990.	7185.	10359.	15023.	2.754E-04	18750.	26219.	40148.	42045.	42319.	41983.
2.512E-04	4990.	7185.	10359.	15023.	2.512E-04	18750.	26219.	40278.	42047.	42321.	41983.
2.291E-04	4990.	7185.	10359.	15023.	2.291E-04	18750.	26219.	40333.	42048.	42321.	41983.
2.089E-04	4990.	7185.	10359.	15023.	2.089E-04	18750.	26219.	40456.	42079.	42321.	41983.
1.905E-04	4990.	7185.	10359.	15023.	1.905E-04	18750.	26219.	40609.	42206.	42343.	41983.
1.738E-04	4990.	7185.	10359.	15023.	1.738E-04	18750.	26219.	40626.	42247.	42343.	41983.
1.585E-04	4990.	7185.	10359.	15023.	1.585E-04	18750.	26219.	40626.	42267.	42343.	41983.
1.445E-04	4990.	7185.	10359.	15023.	1.445E-04	18750.	26219.	40626.	42296.	42343.	41983.
1.318E-04	4990.	7185.	10359.	15023.	1.318E-04	18750.	26219.	40626.	42318.	42343.	41983.
1.202E-04	4990.	7185.	10359.	15023.	1.202E-04	18750.	26219.	40626.	42318.	42343.	41983.
1.096E-04	4990.	7185.	10359.	15023.	1.096E-04	18750.	26219.	40626.	42344.	42343.	41983.
1.000E-04	4990.	7185.	10359.	15023.	1.000E-04	18750.	26219.	40626.	42344.	42343.	41983.
9.120E-05	4990.	7185.	10359.	15023.	9.120E-05	18750.	26219.	40626.	42344.	42343.	41983.
8.318E-05	4990.	7185.	10359.	15023.	8.318E-05	18750.	26219.	40626.	42344.	42343.	41983.
7.586E-05	4990.	7185.	10359.	15023.	7.586E-05	18750.	26219.	40626.	42344.	42343.	41983.
6.918E-05	4990.	7185.	10359.	15023.	6.918E-05	18750.	26219.	40626.	42344.	42343.	41983.
6.310E-05	4990.	7185.	10359.	15023.	6.310E-05	18750.	26219.	40626.	42344.	42343.	41983.
5.754E-05	4990.	7185.	10359.	15023.	5.754E-05	18750.	26219.	40626.	42344.	42343.	41983.
5.248E-05	4990.	7185.	10359.	15023.	5.248E-05	18750.	26219.	40626.	42344.	42343.	41983.
4.786E-05	4990.	7185.	10359.	15023.	4.786E-05	18750.	26219.	40626.	42344.	42343.	41983.
4.365E-05	4990.	7185.	10359.	15023.	4.365E-05	18750.	26219.	40626.	42344.	42343.	41983.
3.981E-05	4990.	7185.	10359.	15023.	3.981E-05	18750.	26219.	40626.	42344.	42343.	41983.
3.631E-05	4990.	7185.	10359.	15023.	3.631E-05	18750.	26219.	40626.	42344.	42343.	41983.
3.311E-05	4990.	7185.	10359.	15023.	3.311E-05	18750.	26219.	40626.	42344.	42343.	41983.
3.020E-05	4990.	7185.	10359.	15023.	3.020E-05	18750.	26219.	40626.	42344.	42343.	41983.
2.754E-05	4990.	7185.	10359.	15023.	2.754E-05	18750.	26219.	40626.	42344.	42343.	41983.
2.512E-05	4990.	7185.	10359.	15023.	2.512E-05	18750.	26219.	40626.	42344.	42343.	41983.
2.291E-05	4990.	7185.	10359.	15023.	2.291E-05	18750.	26219.	40626.	42344.	42343.	41983.
2.089E-05	4990.	7185.	10359.	15023.	2.089E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.905E-05	4990.	7185.	10359.	15023.	1.905E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.738E-05	4990.	7185.	10359.	15023.	1.738E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.585E-05	4990.	7185.	10359.	15023.	1.585E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.445E-05	4990.	7185.	10359.	15023.	1.445E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.318E-05	4990.	7185.	10359.	15023.	1.318E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.202E-05	4990.	7185.	10359.	15023.	1.202E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.096E-05	4990.	7185.	10359.	15023.	1.096E-05	18750.	26219.	40626.	42344.	42343.	41983.
1.000E-05	4990.	7185.	10359.	15023.	1.000E-05	18750.	26219.	40626.	42344.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 11/30/2004 at 12:12:47

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 185
Wind direction sector width (deg) = 90
Wind direction window (deg) = 140 - 230
Distance to intake (m) = 14.8
Intake height (m) = 15.2
Terrain elevation difference (m) = .0

Output file names
H1toCR.log
H1toCR.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 4606
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 384
Hours direction not in window or calm = 38346

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	4990.	7185.	10359.	15023.	18750.	26219.	40626.	42344.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	38346.	36091.	32798.	27898.	24233.	16483.	1930.	194.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	11.51	16.60	24.00	35.00	43.62	61.40	95.46	99.54	100.00	100.00

95th PERCENTILE X/Q VALUES

	4.66E-03	3.79E-03	3.17E-03	2.66E-03	2.12E-03	1.47E-03	8.68E-04	7.32E-04	6.28E-04	5.64E-04

95% X/Q for standard averaging intervals

0 to 2 hours	4.66E-03
2 to 8 hours	1.99E-03
8 to 24 hours	8.70E-04
1 to 4 days	6.69E-04
4 to 30 days	5.17E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.44E-02	2.56E-03
SECTOR-AVERAGE	8.99E-03	1.70E-03

NORMAL PROGRAM COMPLETION

Ground Hatch 2 to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
  2583.60
    0.00
    0.00
    0.00
 163  90
   12.80
   15.24
    0.00
H2toCR.log
H2toCR.cfd
 .1
    0.20
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-02	0.	0.	0.	0.	9.120E-02	0.	0.	0.	0.	0.	0.
8.318E-02	0.	0.	0.	0.	8.318E-02	0.	0.	0.	0.	0.	0.
7.586E-02	0.	0.	0.	0.	7.586E-02	0.	0.	0.	0.	0.	0.
6.918E-02	0.	0.	0.	0.	6.918E-02	0.	0.	0.	0.	0.	0.
6.310E-02	0.	0.	0.	0.	6.310E-02	0.	0.	0.	0.	0.	0.
5.754E-02	0.	0.	0.	0.	5.754E-02	0.	0.	0.	0.	0.	0.
5.248E-02	0.	0.	0.	0.	5.248E-02	0.	0.	0.	0.	0.	0.
4.786E-02	0.	0.	0.	0.	4.786E-02	0.	0.	0.	0.	0.	0.
4.365E-02	0.	0.	0.	0.	4.365E-02	0.	0.	0.	0.	0.	0.
3.981E-02	0.	0.	0.	0.	3.981E-02	0.	0.	0.	0.	0.	0.
3.631E-02	0.	0.	0.	0.	3.631E-02	0.	0.	0.	0.	0.	0.
3.311E-02	0.	0.	0.	0.	3.311E-02	0.	0.	0.	0.	0.	0.
3.020E-02	0.	0.	0.	0.	3.020E-02	0.	0.	0.	0.	0.	0.
2.754E-02	0.	0.	0.	0.	2.754E-02	0.	0.	0.	0.	0.	0.
2.512E-02	0.	0.	0.	0.	2.512E-02	0.	0.	0.	0.	0.	0.
2.291E-02	0.	0.	0.	0.	2.291E-02	0.	0.	0.	0.	0.	0.
2.089E-02	0.	0.	0.	0.	2.089E-02	0.	0.	0.	0.	0.	0.
1.905E-02	0.	0.	0.	0.	1.905E-02	0.	0.	0.	0.	0.	0.
1.738E-02	0.	0.	0.	0.	1.738E-02	0.	0.	0.	0.	0.	0.
1.585E-02	2.	0.	0.	0.	1.585E-02	0.	0.	0.	0.	0.	0.
1.445E-02	28.	11.	5.	0.	1.445E-02	0.	0.	0.	0.	0.	0.
1.318E-02	69.	58.	35.	7.	1.318E-02	0.	0.	0.	0.	0.	0.
1.202E-02	327.	216.	109.	32.	1.202E-02	0.	0.	0.	0.	0.	0.
1.096E-02	569.	375.	219.	69.	1.096E-02	4.	0.	0.	0.	0.	0.
1.000E-02	857.	574.	325.	137.	1.000E-02	21.	0.	0.	0.	0.	0.
9.120E-03	1080.	769.	471.	244.	9.120E-03	48.	0.	0.	0.	0.	0.
8.318E-03	1524.	1067.	708.	402.	8.318E-03	111.	0.	0.	0.	0.	0.
7.586E-03	1980.	1400.	991.	600.	7.586E-03	196.	5.	0.	0.	0.	0.
6.918E-03	2344.	1728.	1324.	865.	6.918E-03	349.	17.	0.	0.	0.	0.
6.310E-03	2714.	2109.	1677.	1167.	6.310E-03	543.	43.	0.	0.	0.	0.
5.754E-03	3289.	2615.	2103.	1485.	5.754E-03	756.	135.	0.	0.	0.	0.
5.248E-03	3636.	3000.	2573.	1900.	5.248E-03	1052.	211.	0.	0.	0.	0.
4.786E-03	4671.	3751.	3111.	2362.	4.786E-03	1377.	306.	0.	0.	0.	0.
4.365E-03	5206.	4303.	3625.	2890.	4.365E-03	1777.	470.	7.	0.	0.	0.
3.981E-03	5410.	4731.	4114.	3443.	3.981E-03	2252.	699.	39.	0.	0.	0.
3.631E-03	5661.	5011.	4631.	4046.	3.631E-03	2741.	1000.	73.	0.	0.	0.
3.311E-03	6487.	5658.	5153.	4601.	3.311E-03	3301.	1342.	99.	22.	0.	0.
3.020E-03	6575.	6077.	5625.	5191.	3.020E-03	3900.	1803.	138.	68.	0.	0.
2.754E-03	6626.	6399.	6051.	5814.	2.754E-03	4546.	2370.	158.	139.	0.	0.
2.512E-03	6626.	7055.	6595.	6424.	2.512E-03	5248.	2995.	218.	155.	0.	0.
2.291E-03	6627.	7429.	7255.	7085.	2.291E-03	5924.	3663.	403.	180.	0.	0.
2.089E-03	6627.	7819.	7699.	7634.	2.089E-03	6560.	4399.	547.	234.	104.	0.
1.905E-03	6627.	7968.	8021.	8352.	1.905E-03	7254.	5162.	869.	374.	191.	0.
1.738E-03	6627.	8074.	8300.	8869.	1.738E-03	7946.	6009.	1492.	492.	250.	0.
1.585E-03	6627.	8772.	8902.	9448.	1.585E-03	8679.	6913.	2192.	712.	407.	0.
1.445E-03	6627.	8888.	9378.	9969.	1.445E-03	9408.	7888.	3189.	1163.	482.	14.
1.318E-03	6627.	8888.	9672.	10391.	1.318E-03	10143.	8946.	4354.	2106.	679.	163.
1.202E-03	6627.	8888.	10335.	11193.	1.202E-03	10796.	9976.	5693.	3599.	1281.	501.
1.096E-03	6627.	8889.	10789.	11718.	1.096E-03	11479.	10922.	7365.	5496.	2229.	958.
1.000E-03	6627.	8889.	10963.	12153.	1.000E-03	12093.	11976.	9183.	7434.	3830.	1797.
9.120E-04	6627.	8889.	11108.	12430.	9.120E-04	12691.	12922.	11122.	9351.	6179.	3429.
8.318E-04	6627.	8889.	11768.	13048.	8.318E-04	13338.	13922.	12862.	11667.	9372.	6394.
7.586E-04	6627.	8889.	11932.	13483.	7.586E-04	13921.	14951.	14706.	14229.	12760.	9892.
6.918E-04	6627.	8889.	11997.	13834.	6.918E-04	14493.	15723.	16834.	16732.	15792.	14928.

6.310E-04	6627.	8889.	11997.	14317.	6.310E-04	14909.	16536.	18555.	19262.	18966.	19916.
5.754E-04	6627.	8889.	11998.	14854.	5.754E-04	15284.	17398.	20447.	21187.	22689.	24580.
5.248E-04	6627.	8889.	11998.	15183.	5.248E-04	15920.	18172.	22106.	23623.	26010.	28955.
4.786E-04	6627.	8889.	11998.	15397.	4.786E-04	16330.	18894.	23668.	25832.	29076.	32479.
4.365E-04	6627.	8889.	11998.	15493.	4.365E-04	16784.	19595.	24898.	27437.	31366.	34332.
3.981E-04	6627.	8889.	11998.	16151.	3.981E-04	17162.	20418.	26317.	29275.	33066.	36367.
3.631E-04	6627.	8889.	11998.	16253.	3.631E-04	17622.	21095.	27711.	30763.	34564.	37886.
3.311E-04	6627.	8889.	11998.	16264.	3.311E-04	17807.	21581.	28985.	32285.	35730.	38648.
3.020E-04	6627.	8889.	11998.	16264.	3.020E-04	18127.	22082.	30499.	33703.	36834.	39153.
2.754E-04	6627.	8889.	11998.	16265.	2.754E-04	18668.	22611.	31439.	34792.	37928.	39376.
2.512E-04	6627.	8889.	11998.	16265.	2.512E-04	19084.	23056.	32368.	35674.	38701.	40029.
2.291E-04	6627.	8889.	11998.	16265.	2.291E-04	19300.	23524.	33328.	36427.	39454.	40436.
2.089E-04	6627.	8889.	11998.	16265.	2.089E-04	19354.	23897.	34095.	37146.	40131.	40774.
1.905E-04	6627.	8889.	11998.	16265.	1.905E-04	19482.	24238.	34915.	37818.	40623.	41060.
1.738E-04	6627.	8889.	11998.	16265.	1.738E-04	19621.	24644.	35384.	38592.	40958.	41152.
1.585E-04	6627.	8889.	11998.	16265.	1.585E-04	19634.	24852.	36149.	39097.	41283.	41384.
1.445E-04	6627.	8889.	11998.	16265.	1.445E-04	19634.	25062.	36563.	39448.	41609.	41847.
1.318E-04	6627.	8889.	11998.	16265.	1.318E-04	19634.	25541.	37168.	39816.	41788.	41945.
1.202E-04	6627.	8889.	11998.	16265.	1.202E-04	19634.	25936.	37543.	40052.	42010.	41983.
1.096E-04	6627.	8889.	11998.	16265.	1.096E-04	19634.	26096.	37934.	40308.	42032.	41983.
1.000E-04	6627.	8889.	11998.	16265.	1.000E-04	19634.	26363.	38284.	40465.	42078.	41983.
9.120E-05	6627.	8889.	11998.	16265.	9.120E-05	19634.	26411.	38657.	40901.	42177.	41983.
8.318E-05	6627.	8889.	11998.	16265.	8.318E-05	19634.	26579.	38911.	41068.	42236.	41983.
7.586E-05	6627.	8889.	11998.	16265.	7.586E-05	19634.	26580.	39111.	41302.	42331.	41983.
6.918E-05	6627.	8889.	11998.	16265.	6.918E-05	19634.	26580.	39211.	41547.	42343.	41983.
6.310E-05	6627.	8889.	11998.	16265.	6.310E-05	19634.	26580.	39468.	41679.	42343.	41983.
5.754E-05	6627.	8889.	11998.	16265.	5.754E-05	19634.	26580.	39606.	41730.	42343.	41983.
5.248E-05	6627.	8889.	11998.	16265.	5.248E-05	19634.	26580.	39769.	41818.	42343.	41983.
4.786E-05	6627.	8889.	11998.	16265.	4.786E-05	19634.	26580.	39851.	41892.	42343.	41983.
4.365E-05	6627.	8889.	11998.	16265.	4.365E-05	19634.	26580.	39931.	41934.	42343.	41983.
3.981E-05	6627.	8889.	11998.	16265.	3.981E-05	19634.	26580.	39939.	41956.	42343.	41983.
3.631E-05	6627.	8889.	11998.	16265.	3.631E-05	19634.	26580.	40066.	42118.	42343.	41983.
3.311E-05	6627.	8889.	11998.	16265.	3.311E-05	19634.	26580.	40136.	42119.	42343.	41983.
3.020E-05	6627.	8889.	11998.	16265.	3.020E-05	19634.	26580.	40253.	42123.	42343.	41983.
2.754E-05	6627.	8889.	11998.	16265.	2.754E-05	19634.	26580.	40356.	42125.	42343.	41983.
2.512E-05	6627.	8889.	11998.	16265.	2.512E-05	19634.	26580.	40387.	42125.	42343.	41983.
2.291E-05	6627.	8889.	11998.	16265.	2.291E-05	19634.	26580.	40431.	42126.	42343.	41983.
2.089E-05	6627.	8889.	11998.	16265.	2.089E-05	19634.	26580.	40610.	42189.	42343.	41983.
1.905E-05	6627.	8889.	11998.	16265.	1.905E-05	19634.	26580.	40610.	42197.	42343.	41983.
1.738E-05	6627.	8889.	11998.	16265.	1.738E-05	19634.	26580.	40610.	42203.	42343.	41983.
1.585E-05	6627.	8889.	11998.	16265.	1.585E-05	19634.	26580.	40610.	42247.	42343.	41983.
1.445E-05	6627.	8889.	11998.	16265.	1.445E-05	19634.	26580.	40610.	42247.	42343.	41983.
1.318E-05	6627.	8889.	11998.	16265.	1.318E-05	19634.	26580.	40610.	42247.	42343.	41983.
1.202E-05	6627.	8889.	11998.	16265.	1.202E-05	19634.	26580.	40610.	42330.	42343.	41983.
1.096E-05	6627.	8889.	11998.	16265.	1.096E-05	19634.	26580.	40610.	42330.	42343.	41983.
1.000E-05	6627.	8889.	11998.	16265.	1.000E-05	19634.	26580.	40610.	42330.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 11/30/2004 at 12:13:20

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 163
Wind direction sector width (deg) = 90
Wind direction window (deg) = 118 - 208
Distance to intake (m) = 12.8
Intake height (m) = 15.2
Terrain elevation difference (m) = .0

Output file names
H2toCR.log
H2toCR.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 6243
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 384
Hours direction not in window or calm = 36709

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
LOW LIM.	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	6627.	8889.	11998.	16265.	19634.	26580.	40610.	42330.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	36709.	34387.	31159.	26656.	23349.	16122.	1946.	208.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	15.29	20.54	27.80	37.90	45.68	62.25	95.43	99.51	100.00	100.00

95th PERCENTILE X/Q VALUES

7.24E-03	6.25E-03	5.70E-03	5.00E-03	4.06E-03	2.86E-03	1.60E-03	1.32E-03	1.11E-03	9.84E-04

95% X/Q for standard averaging intervals

0 to 2 hours	7.24E-03
2 to 8 hours	4.26E-03
8 to 24 hours	1.80E-03
1 to 4 days	1.18E-03
4 to 30 days	8.89E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.60E-02	2.33E-03
SECTOR-AVERAGE	1.00E-02	1.46E-03

NORMAL PROGRAM COMPLETION

Ground Hatch 3 to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
  2583.60
    0.00
    0.00
    0.00
 303  90
   14.80
   15.24
    0.00
H3toCR.log
H3toCR.cfd
 .1
    0.20
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-02	0.	0.	0.	0.	9.120E-02	0.	0.	0.	0.	0.	0.
8.318E-02	0.	0.	0.	0.	8.318E-02	0.	0.	0.	0.	0.	0.
7.586E-02	0.	0.	0.	0.	7.586E-02	0.	0.	0.	0.	0.	0.
6.918E-02	0.	0.	0.	0.	6.918E-02	0.	0.	0.	0.	0.	0.
6.310E-02	0.	0.	0.	0.	6.310E-02	0.	0.	0.	0.	0.	0.
5.754E-02	0.	0.	0.	0.	5.754E-02	0.	0.	0.	0.	0.	0.
5.248E-02	0.	0.	0.	0.	5.248E-02	0.	0.	0.	0.	0.	0.
4.786E-02	0.	0.	0.	0.	4.786E-02	0.	0.	0.	0.	0.	0.
4.365E-02	0.	0.	0.	0.	4.365E-02	0.	0.	0.	0.	0.	0.
3.981E-02	0.	0.	0.	0.	3.981E-02	0.	0.	0.	0.	0.	0.
3.631E-02	0.	0.	0.	0.	3.631E-02	0.	0.	0.	0.	0.	0.
3.311E-02	0.	0.	0.	0.	3.311E-02	0.	0.	0.	0.	0.	0.
3.020E-02	0.	0.	0.	0.	3.020E-02	0.	0.	0.	0.	0.	0.
2.754E-02	0.	0.	0.	0.	2.754E-02	0.	0.	0.	0.	0.	0.
2.512E-02	0.	0.	0.	0.	2.512E-02	0.	0.	0.	0.	0.	0.
2.291E-02	0.	0.	0.	0.	2.291E-02	0.	0.	0.	0.	0.	0.
2.089E-02	0.	0.	0.	0.	2.089E-02	0.	0.	0.	0.	0.	0.
1.905E-02	0.	0.	0.	0.	1.905E-02	0.	0.	0.	0.	0.	0.
1.738E-02	0.	0.	0.	0.	1.738E-02	0.	0.	0.	0.	0.	0.
1.585E-02	9.	5.	4.	1.	1.585E-02	0.	0.	0.	0.	0.	0.
1.445E-02	99.	43.	16.	4.	1.445E-02	0.	0.	0.	0.	0.	0.
1.318E-02	428.	303.	162.	65.	1.318E-02	0.	0.	0.	0.	0.	0.
1.202E-02	1920.	1356.	914.	461.	1.202E-02	7.	0.	0.	0.	0.	0.
1.096E-02	4383.	3480.	2534.	1478.	1.096E-02	95.	0.	0.	0.	0.	0.
1.000E-02	7516.	6343.	4921.	3503.	1.000E-02	526.	0.	0.	0.	0.	0.
9.120E-03	9211.	8009.	6638.	5185.	9.120E-03	1876.	3.	0.	0.	0.	0.
8.318E-03	10290.	9425.	8101.	6746.	8.318E-03	3652.	128.	0.	0.	0.	0.
7.586E-03	12062.	10521.	9500.	8231.	7.586E-03	5277.	727.	0.	0.	0.	0.
6.918E-03	13149.	11401.	10736.	9722.	6.918E-03	6886.	2004.	0.	0.	0.	0.
6.310E-03	13891.	12180.	11861.	11159.	6.310E-03	8539.	3683.	14.	0.	0.	0.
5.754E-03	14385.	12980.	12883.	12587.	5.754E-03	10086.	5688.	74.	0.	0.	0.
5.248E-03	15191.	13985.	13964.	13866.	5.248E-03	11689.	7523.	404.	26.	0.	0.
4.786E-03	15450.	14886.	14950.	15095.	4.786E-03	13148.	9302.	1083.	122.	0.	0.
4.365E-03	15996.	15673.	15832.	16151.	4.365E-03	14496.	11049.	2160.	446.	19.	0.
3.981E-03	16448.	16490.	16683.	17225.	3.981E-03	15846.	12776.	4268.	1676.	316.	0.
3.631E-03	16872.	17576.	17517.	18170.	3.631E-03	17098.	14435.	6974.	3541.	1072.	263.
3.311E-03	17342.	18365.	18270.	19127.	3.311E-03	18158.	16064.	9871.	6448.	3481.	1459.
3.020E-03	17692.	19057.	19062.	19922.	3.020E-03	19206.	17704.	13112.	10305.	7122.	4707.
2.754E-03	18686.	19937.	19886.	20721.	2.754E-03	20094.	19226.	16356.	14218.	11251.	8423.
2.512E-03	18990.	20837.	20742.	21549.	2.512E-03	21002.	20548.	19465.	18188.	15932.	14555.
2.291E-03	19129.	21195.	21329.	22287.	2.291E-03	21811.	21817.	22529.	22582.	21696.	21659.
2.089E-03	19228.	21704.	22137.	23001.	2.089E-03	22576.	22928.	25446.	26291.	26870.	27930.
1.905E-03	19259.	21895.	22729.	23584.	1.905E-03	23298.	24049.	27810.	29381.	31763.	32516.
1.738E-03	19273.	22002.	23281.	24174.	1.738E-03	24026.	24986.	29868.	32177.	35303.	36497.
1.585E-03	19276.	22061.	23750.	24770.	1.585E-03	24801.	25948.	31933.	34186.	37523.	39151.
1.445E-03	19278.	22638.	24391.	25402.	1.445E-03	25492.	26883.	33626.	35919.	39203.	40607.
1.318E-03	19282.	22663.	25002.	25991.	1.318E-03	26142.	27721.	35068.	37376.	40238.	41280.
1.202E-03	19282.	22675.	25391.	26507.	1.202E-03	26775.	28513.	36142.	38664.	40865.	41748.
1.096E-03	19282.	22682.	25775.	27071.	1.096E-03	27399.	29279.	37034.	39459.	41239.	41971.
1.000E-03	19282.	22686.	26009.	27529.	1.000E-03	27978.	30017.	37756.	40217.	41526.	41983.
9.120E-04	19282.	22686.	26188.	28069.	9.120E-04	28520.	30684.	38464.	40817.	41773.	41983.
8.318E-04	19282.	22691.	26245.	28457.	8.318E-04	29046.	31430.	38987.	41232.	41845.	41983.
7.586E-04	19282.	22691.	26292.	28912.	7.586E-04	29520.	32112.	39536.	41493.	41882.	41983.
6.918E-04	19282.	22691.	26796.	29533.	6.918E-04	30044.	32660.	39948.	41689.	42039.	41983.

6.310E-04	19282.	22691.	26827.	30078.	6.310E-04	30539.	33174.	40242.	41825.	42087.	41983.
5.754E-04	19282.	22691.	26827.	30438.	5.754E-04	31058.	33712.	40517.	41928.	42179.	41983.
5.248E-04	19282.	22691.	26833.	30776.	5.248E-04	31497.	34242.	40768.	42073.	42215.	41983.
4.786E-04	19282.	22691.	26834.	30981.	4.786E-04	32008.	34736.	41015.	42126.	42280.	41983.
4.365E-04	19282.	22691.	26834.	31060.	4.365E-04	32388.	35259.	41195.	42191.	42294.	41983.
3.981E-04	19282.	22691.	26834.	31132.	3.981E-04	32827.	35650.	41365.	42234.	42306.	41983.
3.631E-04	19282.	22691.	26834.	31495.	3.631E-04	33200.	36038.	41539.	42258.	42327.	41983.
3.311E-04	19282.	22691.	26834.	31524.	3.311E-04	33512.	36496.	41688.	42272.	42343.	41983.
3.020E-04	19282.	22691.	26834.	31545.	3.020E-04	33772.	36851.	41790.	42291.	42343.	41983.
2.754E-04	19282.	22691.	26834.	31545.	2.754E-04	33994.	37139.	41884.	42321.	42343.	41983.
2.512E-04	19282.	22691.	26834.	31547.	2.512E-04	34184.	37474.	41975.	42347.	42343.	41983.
2.291E-04	19282.	22691.	26834.	31547.	2.291E-04	34513.	37750.	42020.	42349.	42343.	41983.
2.089E-04	19282.	22691.	26834.	31547.	2.089E-04	34606.	37966.	42072.	42383.	42343.	41983.
1.905E-04	19282.	22691.	26834.	31547.	1.905E-04	34690.	38199.	42134.	42407.	42343.	41983.
1.738E-04	19282.	22691.	26834.	31547.	1.738E-04	34774.	38424.	42228.	42423.	42343.	41983.
1.585E-04	19282.	22691.	26834.	31547.	1.585E-04	34783.	38616.	42297.	42431.	42343.	41983.
1.445E-04	19282.	22691.	26834.	31547.	1.445E-04	34820.	38775.	42300.	42459.	42343.	41983.
1.318E-04	19282.	22691.	26834.	31547.	1.318E-04	34821.	38940.	42342.	42459.	42343.	41983.
1.202E-04	19282.	22691.	26834.	31547.	1.202E-04	34821.	39151.	42361.	42471.	42343.	41983.
1.096E-04	19282.	22691.	26834.	31547.	1.096E-04	34822.	39313.	42381.	42471.	42343.	41983.
1.000E-04	19282.	22691.	26834.	31547.	1.000E-04	34822.	39390.	42390.	42471.	42343.	41983.
9.120E-05	19282.	22691.	26834.	31547.	9.120E-05	34822.	39407.	42391.	42538.	42343.	41983.
8.318E-05	19282.	22691.	26834.	31547.	8.318E-05	34822.	39448.	42396.	42538.	42343.	41983.
7.586E-05	19282.	22691.	26834.	31547.	7.586E-05	34822.	39471.	42396.	42538.	42343.	41983.
6.918E-05	19282.	22691.	26834.	31547.	6.918E-05	34822.	39471.	42404.	42538.	42343.	41983.
6.310E-05	19282.	22691.	26834.	31547.	6.310E-05	34822.	39471.	42409.	42538.	42343.	41983.
5.754E-05	19282.	22691.	26834.	31547.	5.754E-05	34822.	39471.	42409.	42538.	42343.	41983.
5.248E-05	19282.	22691.	26834.	31547.	5.248E-05	34822.	39472.	42429.	42538.	42343.	41983.
4.786E-05	19282.	22691.	26834.	31547.	4.786E-05	34822.	39472.	42429.	42538.	42343.	41983.
4.365E-05	19282.	22691.	26834.	31547.	4.365E-05	34822.	39472.	42432.	42538.	42343.	41983.
3.981E-05	19282.	22691.	26834.	31547.	3.981E-05	34822.	39472.	42441.	42538.	42343.	41983.
3.631E-05	19282.	22691.	26834.	31547.	3.631E-05	34822.	39472.	42453.	42538.	42343.	41983.
3.311E-05	19282.	22691.	26834.	31547.	3.311E-05	34822.	39472.	42456.	42538.	42343.	41983.
3.020E-05	19282.	22691.	26834.	31547.	3.020E-05	34822.	39472.	42460.	42538.	42343.	41983.
2.754E-05	19282.	22691.	26834.	31547.	2.754E-05	34822.	39472.	42473.	42538.	42343.	41983.
2.512E-05	19282.	22691.	26834.	31547.	2.512E-05	34822.	39472.	42473.	42538.	42343.	41983.
2.291E-05	19282.	22691.	26834.	31547.	2.291E-05	34822.	39472.	42473.	42538.	42343.	41983.
2.089E-05	19282.	22691.	26834.	31547.	2.089E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.905E-05	19282.	22691.	26834.	31547.	1.905E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.738E-05	19282.	22691.	26834.	31547.	1.738E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.585E-05	19282.	22691.	26834.	31547.	1.585E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.445E-05	19282.	22691.	26834.	31547.	1.445E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.318E-05	19282.	22691.	26834.	31547.	1.318E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.202E-05	19282.	22691.	26834.	31547.	1.202E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.096E-05	19282.	22691.	26834.	31547.	1.096E-05	34822.	39472.	42478.	42538.	42343.	41983.
1.000E-05	19282.	22691.	26834.	31547.	1.000E-05	34822.	39472.	42478.	42538.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 11/30/2004 at 12:13:50

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 303
Wind direction sector width (deg) = 90
Wind direction window (deg) = 258 - 348
Distance to intake (m) = 14.8
Intake height (m) = 15.2
Terrain elevation difference (m) = .0

Output file names
H3toCR.log
H3toCR.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 18898
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 384
Hours direction not in window or calm = 24054

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
LOW LIM.	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	19282.	22691.	26834.	31547.	34822.	39472.	42478.	42538.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	24054.	20585.	16323.	11374.	8161.	3230.	78.	0.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	44.49	52.43	62.18	73.50	81.01	92.44	99.82	100.00	100.00	100.00

95th PERCENTILE X/Q VALUES
1.19E-02 1.16E-02 1.12E-02 1.06E-02 9.00E-03 6.87E-03 4.38E-03 3.90E-03 3.49E-03 3.25E-03

95% X/Q for standard averaging intervals

0 to 2 hours	1.19E-02
2 to 8 hours	1.02E-02
8 to 24 hours	4.98E-03
1 to 4 days	3.55E-03
4 to 30 days	3.08E-03

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.64E-02	1.32E-03
SECTOR-AVERAGE	1.03E-02	8.27E-04

NORMAL PROGRAM COMPLETION

Ground Hatch 4 to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
 2583.60
    0.00
    0.00
    0.00
 325  90
   12.80
   15.24
    0.00
H4toCR.log
H4toCR.cfd
 .1
    0.20
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-02	0.	0.	0.	0.	9.120E-02	0.	0.	0.	0.	0.	0.
8.318E-02	0.	0.	0.	0.	8.318E-02	0.	0.	0.	0.	0.	0.
7.586E-02	0.	0.	0.	0.	7.586E-02	0.	0.	0.	0.	0.	0.
6.918E-02	0.	0.	0.	0.	6.918E-02	0.	0.	0.	0.	0.	0.
6.310E-02	0.	0.	0.	0.	6.310E-02	0.	0.	0.	0.	0.	0.
5.754E-02	0.	0.	0.	0.	5.754E-02	0.	0.	0.	0.	0.	0.
5.248E-02	0.	0.	0.	0.	5.248E-02	0.	0.	0.	0.	0.	0.
4.786E-02	0.	0.	0.	0.	4.786E-02	0.	0.	0.	0.	0.	0.
4.365E-02	0.	0.	0.	0.	4.365E-02	0.	0.	0.	0.	0.	0.
3.981E-02	0.	0.	0.	0.	3.981E-02	0.	0.	0.	0.	0.	0.
3.631E-02	0.	0.	0.	0.	3.631E-02	0.	0.	0.	0.	0.	0.
3.311E-02	0.	0.	0.	0.	3.311E-02	0.	0.	0.	0.	0.	0.
3.020E-02	0.	0.	0.	0.	3.020E-02	0.	0.	0.	0.	0.	0.
2.754E-02	0.	0.	0.	0.	2.754E-02	0.	0.	0.	0.	0.	0.
2.512E-02	0.	0.	0.	0.	2.512E-02	0.	0.	0.	0.	0.	0.
2.291E-02	0.	0.	0.	0.	2.291E-02	0.	0.	0.	0.	0.	0.
2.089E-02	0.	0.	0.	0.	2.089E-02	0.	0.	0.	0.	0.	0.
1.905E-02	0.	0.	0.	0.	1.905E-02	0.	0.	0.	0.	0.	0.
1.738E-02	13.	7.	4.	0.	1.738E-02	0.	0.	0.	0.	0.	0.
1.585E-02	74.	20.	5.	2.	1.585E-02	0.	0.	0.	0.	0.	0.
1.445E-02	649.	299.	112.	22.	1.445E-02	0.	0.	0.	0.	0.	0.
1.318E-02	1285.	941.	525.	236.	1.318E-02	0.	0.	0.	0.	0.	0.
1.202E-02	4176.	3110.	1994.	1099.	1.202E-02	33.	0.	0.	0.	0.	0.
1.096E-02	5679.	4343.	3164.	2049.	1.096E-02	269.	0.	0.	0.	0.	0.
1.000E-02	6510.	5411.	4099.	2982.	1.000E-02	1124.	15.	0.	0.	0.	0.
9.120E-03	6862.	5987.	5049.	3879.	9.120E-03	1992.	75.	0.	0.	0.	0.
8.318E-03	8083.	6695.	5957.	4768.	8.318E-03	2900.	388.	0.	0.	0.	0.
7.586E-03	8778.	7244.	6711.	5675.	7.586E-03	3794.	947.	0.	0.	0.	0.
6.918E-03	9150.	7861.	7545.	6632.	6.918E-03	4767.	1682.	0.	0.	0.	0.
6.310E-03	9431.	8624.	8335.	7563.	6.310E-03	5736.	2577.	7.	0.	0.	0.
5.754E-03	9766.	9663.	9318.	8573.	5.754E-03	6738.	3521.	56.	0.	0.	0.
5.248E-03	9906.	10289.	10094.	9614.	5.248E-03	7760.	4564.	220.	0.	0.	0.
4.786E-03	10658.	11063.	10913.	10643.	4.786E-03	8805.	5644.	551.	33.	0.	0.
4.365E-03	11214.	11850.	11602.	11732.	4.365E-03	9903.	6859.	1035.	144.	0.	0.
3.981E-03	11627.	12555.	12264.	12724.	3.981E-03	10948.	8100.	1826.	607.	0.	0.
3.631E-03	12138.	13153.	12960.	13634.	3.631E-03	12137.	9350.	2855.	1343.	73.	0.
3.311E-03	13092.	13886.	13795.	14434.	3.311E-03	13229.	10638.	4082.	2434.	793.	0.
3.020E-03	13364.	14448.	14689.	15298.	3.020E-03	14270.	11874.	5996.	3773.	2258.	675.
2.754E-03	13606.	14847.	15409.	16071.	2.754E-03	15219.	13255.	8320.	5569.	4202.	2550.
2.512E-03	13726.	15295.	15916.	16767.	2.512E-03	16071.	14630.	10894.	8168.	6323.	5330.
2.291E-03	13808.	15602.	16572.	17363.	2.291E-03	16892.	16007.	13662.	11341.	9108.	8311.
2.089E-03	13835.	15820.	16993.	17859.	2.089E-03	17649.	17400.	16541.	15078.	12957.	12433.
1.905E-03	13843.	15891.	17370.	18285.	1.905E-03	18497.	18703.	19149.	18341.	17368.	16647.
1.738E-03	13845.	15919.	17669.	18857.	1.738E-03	19216.	19921.	21415.	21470.	20960.	20369.
1.585E-03	13848.	16447.	18213.	19456.	1.585E-03	19880.	21100.	23966.	24499.	25016.	25366.
1.445E-03	13851.	16466.	18633.	20121.	1.445E-03	20475.	22180.	26117.	27510.	28975.	29953.
1.318E-03	13851.	16470.	18863.	20642.	1.318E-03	21083.	23190.	27993.	30123.	31803.	32606.
1.202E-03	13851.	16472.	19273.	21318.	1.202E-03	21605.	24044.	29786.	32235.	34145.	34740.
1.096E-03	13851.	16472.	19565.	21745.	1.096E-03	22177.	24875.	31339.	34044.	36015.	37065.
1.000E-03	13851.	16472.	19660.	22122.	1.000E-03	22839.	25711.	32968.	35444.	37483.	38640.
9.120E-04	13851.	16472.	19712.	22453.	9.120E-04	23406.	26537.	34177.	36772.	38864.	39624.
8.318E-04	13851.	16472.	20120.	23085.	8.318E-04	23944.	27191.	35311.	37816.	40004.	40136.
7.586E-04	13851.	16472.	20283.	23642.	7.586E-04	24425.	27832.	36335.	38453.	40558.	40863.
6.918E-04	13851.	16472.	20287.	23963.	6.918E-04	24877.	28416.	37089.	39051.	41031.	41711.

6.310E-04	13851.	16472.	20288.	24315.	6.310E-04	25371.	28889.	37727.	39645.	41314.	41918.
5.754E-04	13851.	16472.	20289.	24711.	5.754E-04	25866.	29464.	38289.	40218.	41627.	41982.
5.248E-04	13851.	16472.	20289.	24976.	5.248E-04	26392.	29909.	38744.	40704.	41840.	41983.
4.786E-04	13851.	16472.	20289.	25094.	4.786E-04	26842.	30406.	39108.	40995.	42115.	41983.
4.365E-04	13851.	16472.	20289.	25112.	4.365E-04	27220.	30792.	39423.	41370.	42229.	41983.
3.981E-04	13851.	16472.	20289.	25564.	3.981E-04	27769.	31244.	39759.	41672.	42268.	41983.
3.631E-04	13851.	16472.	20289.	25592.	3.631E-04	28193.	31623.	40125.	41809.	42293.	41983.
3.311E-04	13851.	16472.	20289.	25593.	3.311E-04	28446.	31955.	40392.	41954.	42309.	41983.
3.020E-04	13851.	16472.	20289.	25594.	3.020E-04	28711.	32428.	40643.	42062.	42336.	41983.
2.754E-04	13851.	16472.	20289.	25594.	2.754E-04	29082.	32908.	40810.	42122.	42339.	41983.
2.512E-04	13851.	16472.	20289.	25594.	2.512E-04	29290.	33301.	41031.	42167.	42343.	41983.
2.291E-04	13851.	16472.	20289.	25594.	2.291E-04	29489.	33573.	41189.	42186.	42343.	41983.
2.089E-04	13851.	16472.	20289.	25594.	2.089E-04	29553.	33865.	41390.	42281.	42343.	41983.
1.905E-04	13851.	16472.	20289.	25594.	1.905E-04	29679.	34290.	41532.	42318.	42343.	41983.
1.738E-04	13851.	16472.	20289.	25594.	1.738E-04	29732.	34693.	41675.	42359.	42343.	41983.
1.585E-04	13851.	16472.	20289.	25594.	1.585E-04	29749.	35036.	41734.	42382.	42343.	41983.
1.445E-04	13851.	16472.	20289.	25594.	1.445E-04	29749.	35294.	41810.	42523.	42343.	41983.
1.318E-04	13851.	16472.	20289.	25594.	1.318E-04	29749.	35591.	41880.	42533.	42343.	41983.
1.202E-04	13851.	16472.	20289.	25594.	1.202E-04	29749.	35882.	41903.	42534.	42343.	41983.
1.096E-04	13851.	16472.	20289.	25594.	1.096E-04	29749.	36038.	41999.	42534.	42343.	41983.
1.000E-04	13851.	16472.	20289.	25594.	1.000E-04	29749.	36233.	42086.	42534.	42343.	41983.
9.120E-05	13851.	16472.	20289.	25594.	9.120E-05	29749.	36249.	42115.	42534.	42343.	41983.
8.318E-05	13851.	16472.	20289.	25594.	8.318E-05	29749.	36294.	42177.	42536.	42343.	41983.
7.586E-05	13851.	16472.	20289.	25594.	7.586E-05	29749.	36294.	42199.	42536.	42343.	41983.
6.918E-05	13851.	16472.	20289.	25594.	6.918E-05	29749.	36294.	42242.	42536.	42343.	41983.
6.310E-05	13851.	16472.	20289.	25594.	6.310E-05	29749.	36294.	42242.	42536.	42343.	41983.
5.754E-05	13851.	16472.	20289.	25594.	5.754E-05	29749.	36294.	42262.	42536.	42343.	41983.
5.248E-05	13851.	16472.	20289.	25594.	5.248E-05	29749.	36294.	42287.	42536.	42343.	41983.
4.786E-05	13851.	16472.	20289.	25594.	4.786E-05	29749.	36294.	42317.	42536.	42343.	41983.
4.365E-05	13851.	16472.	20289.	25594.	4.365E-05	29749.	36294.	42348.	42537.	42343.	41983.
3.981E-05	13851.	16472.	20289.	25594.	3.981E-05	29749.	36294.	42376.	42537.	42343.	41983.
3.631E-05	13851.	16472.	20289.	25594.	3.631E-05	29749.	36294.	42376.	42537.	42343.	41983.
3.311E-05	13851.	16472.	20289.	25594.	3.311E-05	29749.	36294.	42377.	42537.	42343.	41983.
3.020E-05	13851.	16472.	20289.	25594.	3.020E-05	29749.	36294.	42398.	42537.	42343.	41983.
2.754E-05	13851.	16472.	20289.	25594.	2.754E-05	29749.	36294.	42408.	42537.	42343.	41983.
2.512E-05	13851.	16472.	20289.	25594.	2.512E-05	29749.	36294.	42416.	42537.	42343.	41983.
2.291E-05	13851.	16472.	20289.	25594.	2.291E-05	29749.	36294.	42418.	42537.	42343.	41983.
2.089E-05	13851.	16472.	20289.	25594.	2.089E-05	29749.	36294.	42418.	42537.	42343.	41983.
1.905E-05	13851.	16472.	20289.	25594.	1.905E-05	29749.	36294.	42418.	42537.	42343.	41983.
1.738E-05	13851.	16472.	20289.	25594.	1.738E-05	29749.	36294.	42418.	42537.	42343.	41983.
1.585E-05	13851.	16472.	20289.	25594.	1.585E-05	29749.	36294.	42418.	42538.	42343.	41983.
1.445E-05	13851.	16472.	20289.	25594.	1.445E-05	29749.	36294.	42418.	42538.	42343.	41983.
1.318E-05	13851.	16472.	20289.	25594.	1.318E-05	29749.	36294.	42418.	42538.	42343.	41983.
1.202E-05	13851.	16472.	20289.	25594.	1.202E-05	29749.	36294.	42418.	42538.	42343.	41983.
1.096E-05	13851.	16472.	20289.	25594.	1.096E-05	29749.	36294.	42418.	42538.	42343.	41983.
1.000E-05	13851.	16472.	20289.	25594.	1.000E-05	29749.	36294.	42418.	42538.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 11/30/2004 at 12:14:22

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 325
Wind direction sector width (deg) = 90
Wind direction window (deg) = 280 - 010
Distance to intake (m) = 12.8
Intake height (m) = 15.2
Terrain elevation difference (m) = .0

Output file names
H4toCR.log
H4toCR.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 13467
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 384
Hours direction not in window or calm = 29485

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
LOW LIM.	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	13851.	16472.	20289.	25594.	29749.	36294.	42418.	42538.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	29485.	26804.	22868.	17327.	13234.	6408.	138.	0.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	31.96	38.06	47.01	59.63	69.21	84.99	99.68	100.00	100.00	100.00

95th PERCENTILE X/Q VALUES

1.28E-02	1.25E-02	1.19E-02	1.09E-02	8.98E-03	6.61E-03	3.88E-03	3.40E-03	3.05E-03	2.82E-03

95% X/Q for standard averaging intervals

0 to 2 hours	1.28E-02
2 to 8 hours	1.02E-02
8 to 24 hours	4.48E-03
1 to 4 days	2.97E-03
4 to 30 days	2.66E-03

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.86E-02	1.49E-03
SECTOR-AVERAGE	1.17E-02	9.35E-04

NORMAL PROGRAM COMPLETION

Unit 2 Roof Scuttle to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
   48.50
 2583.60
    0.00
    0.00
    0.00
 96  90
   52.29
   48.50
    0.00
2RHtoCR1.log
2RHtoCR1.cfd
 .1
    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00    0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	24.	6.	3.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	100.	37.	16.	12.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	391.	197.	90.	39.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	872.	632.	352.	190.	2.089E-03	13.	0.	0.	0.	0.	0.
1.905E-03	2147.	1530.	937.	518.	1.905E-03	79.	0.	0.	0.	0.	0.
1.738E-03	3177.	2334.	1628.	1006.	1.738E-03	216.	1.	0.	0.	0.	0.
1.585E-03	3941.	3173.	2344.	1613.	1.585E-03	557.	46.	0.	0.	0.	0.
1.445E-03	4489.	3726.	3076.	2275.	1.445E-03	990.	150.	0.	0.	0.	0.
1.318E-03	5890.	4604.	3839.	3006.	1.318E-03	1564.	291.	7.	0.	0.	0.
1.202E-03	6566.	5190.	4533.	3741.	1.202E-03	2208.	563.	39.	0.	0.	0.
1.096E-03	7146.	5860.	5274.	4518.	1.096E-03	2922.	867.	60.	0.	0.	0.
1.000E-03	7611.	6611.	6051.	5351.	1.000E-03	3701.	1266.	73.	0.	0.	0.
9.120E-04	7865.	7431.	6881.	6253.	9.120E-04	4523.	1900.	96.	41.	0.	0.
8.318E-04	8137.	7979.	7731.	7195.	8.318E-04	5467.	2689.	200.	73.	0.	0.
7.586E-04	9868.	9490.	8849.	8153.	7.586E-04	6424.	3567.	356.	97.	0.	0.
6.918E-04	11102.	10782.	9865.	9200.	6.918E-04	7387.	4471.	644.	127.	0.	0.
6.310E-04	11481.	11529.	10614.	10190.	6.310E-04	8445.	5509.	1050.	256.	26.	0.
5.754E-04	11716.	11966.	11409.	11134.	5.754E-04	9505.	6548.	1470.	531.	124.	0.
5.248E-04	11835.	12500.	12272.	12006.	5.248E-04	10527.	7666.	2312.	964.	283.	0.
4.786E-04	11884.	12755.	12908.	12962.	4.786E-04	11602.	8836.	3168.	1562.	619.	22.
4.365E-04	11906.	12940.	13432.	13807.	4.365E-04	12585.	10111.	4397.	2461.	1152.	270.
3.981E-04	11918.	13581.	14091.	14683.	3.981E-04	13465.	11509.	6168.	3871.	1831.	536.
3.631E-04	11926.	14063.	14674.	15434.	3.631E-04	14377.	12839.	7986.	5935.	3042.	1620.
3.311E-04	11931.	14544.	15382.	16054.	3.311E-04	15306.	14138.	10047.	8095.	5033.	3458.
3.020E-04	11932.	14644.	15813.	16668.	3.020E-04	16130.	15401.	12487.	10723.	8124.	6114.
2.754E-04	11933.	14676.	16213.	17340.	2.754E-04	16991.	16637.	14914.	13567.	12007.	9554.
2.512E-04	11934.	14686.	16511.	17940.	2.512E-04	17757.	17829.	17485.	16539.	15618.	14873.
2.291E-04	11934.	14689.	16697.	18440.	2.291E-04	18460.	18910.	19717.	19634.	19222.	19870.
2.089E-04	11934.	14690.	16896.	18764.	2.089E-04	19065.	19953.	21895.	22568.	22718.	23742.
1.905E-04	11934.	14690.	17557.	19441.	1.905E-04	19703.	20995.	23986.	25387.	26783.	28396.
1.738E-04	11934.	14690.	18055.	20008.	1.738E-04	20309.	21949.	26004.	28122.	30343.	32054.
1.585E-04	11934.	14691.	18187.	20446.	1.585E-04	20914.	22853.	27754.	30297.	33262.	35538.
1.445E-04	11934.	14691.	18222.	20728.	1.445E-04	21385.	23607.	29302.	32459.	35575.	37924.
1.318E-04	11934.	14691.	18237.	21077.	1.318E-04	21847.	24434.	30823.	34066.	37073.	39281.
1.202E-04	11934.	14691.	18242.	21256.	1.202E-04	22425.	25102.	32172.	35478.	38377.	40149.
1.096E-04	11934.	14691.	18243.	21467.	1.096E-04	22919.	25698.	33112.	36629.	39207.	40531.
1.000E-04	11934.	14691.	18244.	22000.	1.000E-04	23313.	26410.	34242.	37592.	40031.	41040.
9.120E-05	11934.	14691.	18244.	22357.	9.120E-05	23628.	27007.	35337.	38612.	40666.	41531.
8.318E-05	11934.	14691.	18245.	22665.	8.318E-05	23982.	27550.	36157.	39426.	41186.	41709.
7.586E-05	11934.	14691.	18245.	22732.	7.586E-05	24265.	28049.	37069.	39862.	41708.	41816.
6.918E-05	11934.	14691.	18245.	22750.	6.918E-05	24521.	28328.	37797.	40326.	41987.	41964.

6.310E-05	11934.	14691.	18245.	22760.	6.310E-05	24937.	28795.	38409.	40662.	42192.	41983.
5.754E-05	11934.	14691.	18245.	22761.	5.754E-05	25265.	29250.	38795.	41133.	42242.	41983.
5.248E-05	11934.	14691.	18245.	22762.	5.248E-05	25435.	29595.	39379.	41530.	42284.	41983.
4.786E-05	11934.	14691.	18245.	22762.	4.786E-05	25531.	29858.	39648.	41753.	42302.	41983.
4.365E-05	11934.	14691.	18245.	22762.	4.365E-05	25600.	30056.	39998.	42005.	42343.	41983.
3.981E-05	11934.	14691.	18245.	22763.	3.981E-05	25958.	30486.	40232.	42161.	42343.	41983.
3.631E-05	11934.	14691.	18245.	22763.	3.631E-05	26054.	30652.	40450.	42267.	42343.	41983.
3.311E-05	11934.	14691.	18245.	22763.	3.311E-05	26103.	31025.	40628.	42312.	42343.	41983.
3.020E-05	11934.	14691.	18245.	22763.	3.020E-05	26119.	31215.	40772.	42355.	42343.	41983.
2.754E-05	11934.	14691.	18245.	22763.	2.754E-05	26126.	31495.	40921.	42372.	42343.	41983.
2.512E-05	11934.	14691.	18245.	22763.	2.512E-05	26130.	31603.	41066.	42431.	42343.	41983.
2.291E-05	11934.	14691.	18245.	22763.	2.291E-05	26131.	31697.	41272.	42458.	42343.	41983.
2.089E-05	11934.	14691.	18245.	22763.	2.089E-05	26132.	32083.	41372.	42472.	42343.	41983.
1.905E-05	11934.	14691.	18245.	22763.	1.905E-05	26132.	32260.	41479.	42474.	42343.	41983.
1.738E-05	11934.	14691.	18245.	22763.	1.738E-05	26132.	32314.	41547.	42484.	42343.	41983.
1.585E-05	11934.	14691.	18245.	22763.	1.585E-05	26132.	32341.	41622.	42487.	42343.	41983.
1.445E-05	11934.	14691.	18245.	22763.	1.445E-05	26132.	32346.	41723.	42489.	42343.	41983.
1.318E-05	11934.	14691.	18245.	22763.	1.318E-05	26132.	32354.	41797.	42513.	42343.	41983.
1.202E-05	11934.	14691.	18245.	22763.	1.202E-05	26132.	32354.	41840.	42514.	42343.	41983.
1.096E-05	11934.	14691.	18245.	22763.	1.096E-05	26132.	32355.	41855.	42515.	42343.	41983.
1.000E-05	11934.	14691.	18245.	22763.	1.000E-05	26132.	32355.	41917.	42519.	42343.	41983.
9.120E-06	11934.	14691.	18245.	22763.	9.120E-06	26132.	32355.	41925.	42523.	42343.	41983.
8.318E-06	11934.	14691.	18245.	22763.	8.318E-06	26132.	32355.	41945.	42523.	42343.	41983.
7.586E-06	11934.	14691.	18245.	22763.	7.586E-06	26132.	32355.	41999.	42523.	42343.	41983.
6.918E-06	11934.	14691.	18245.	22763.	6.918E-06	26132.	32355.	42021.	42523.	42343.	41983.
6.310E-06	11934.	14691.	18245.	22763.	6.310E-06	26132.	32355.	42021.	42524.	42343.	41983.
5.754E-06	11934.	14691.	18245.	22763.	5.754E-06	26132.	32355.	42025.	42524.	42343.	41983.
5.248E-06	11934.	14691.	18245.	22763.	5.248E-06	26132.	32355.	42117.	42524.	42343.	41983.
4.786E-06	11934.	14691.	18245.	22763.	4.786E-06	26132.	32355.	42123.	42524.	42343.	41983.
4.365E-06	11934.	14691.	18245.	22763.	4.365E-06	26132.	32355.	42126.	42524.	42343.	41983.
3.981E-06	11934.	14691.	18245.	22763.	3.981E-06	26132.	32355.	42127.	42524.	42343.	41983.
3.631E-06	11934.	14691.	18245.	22763.	3.631E-06	26132.	32355.	42127.	42524.	42343.	41983.
3.311E-06	11934.	14691.	18245.	22763.	3.311E-06	26132.	32355.	42128.	42524.	42343.	41983.
3.020E-06	11934.	14691.	18245.	22763.	3.020E-06	26132.	32355.	42128.	42538.	42343.	41983.
2.754E-06	11934.	14691.	18245.	22763.	2.754E-06	26132.	32355.	42128.	42538.	42343.	41983.
2.512E-06	11934.	14691.	18245.	22763.	2.512E-06	26132.	32355.	42128.	42538.	42343.	41983.
2.291E-06	11934.	14691.	18245.	22763.	2.291E-06	26132.	32355.	42128.	42538.	42343.	41983.
2.089E-06	11934.	14691.	18245.	22763.	2.089E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.905E-06	11934.	14691.	18245.	22763.	1.905E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.738E-06	11934.	14691.	18245.	22763.	1.738E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.585E-06	11934.	14691.	18245.	22763.	1.585E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.445E-06	11934.	14691.	18245.	22763.	1.445E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.318E-06	11934.	14691.	18245.	22763.	1.318E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.202E-06	11934.	14691.	18245.	22763.	1.202E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.096E-06	11934.	14691.	18245.	22763.	1.096E-06	26132.	32355.	42128.	42538.	42343.	41983.
1.000E-06	11934.	14691.	18245.	22763.	1.000E-06	26132.	32355.	42128.	42538.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/ 9/2004 at 13:48:39

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 48.5
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 096
Wind direction sector width (deg) = 90
Wind direction window (deg) = 051 - 141
Distance to intake (m) = 52.3
Intake height (m) = 48.5
Terrain elevation difference (m) = .0

Output file names
2RHtoCR1.log
2RHtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 11502
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 432
Hours direction not in window or calm = 31402

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	11934.	14691.	18245.	22763.	26132.	32355.	42128.	42538.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	31402.	28585.	24912.	20158.	16851.	10347.	428.	0.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	27.54	33.95	42.28	53.03	60.80	75.77	98.99	100.00	100.00	100.00

95th PERCENTILE X/Q VALUES

1.90E-03	1.77E-03	1.62E-03	1.47E-03	1.21E-03	8.88E-04	5.36E-04	4.52E-04	3.90E-04	3.55E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.90E-03
2 to 8 hours	1.33E-03
8 to 24 hours	5.96E-04
1 to 4 days	4.18E-04
4 to 30 days	3.27E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.90E-03	2.64E-04
SECTOR-AVERAGE	1.82E-03	1.65E-04

NORMAL PROGRAM COMPLETION

Unit 3 Roof Scuttle to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
   48.50
 2583.60
    0.00
    0.00
    0.00
 32  90
   52.29
   48.50
    0.00
3RHtoCR1.log
3RHtoCR1.cfd
 .1
    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	8.	1.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	62.	15.	4.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	196.	89.	27.	7.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	409.	244.	98.	25.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	968.	594.	321.	132.	1.905E-03	3.	0.	0.	0.	0.	0.
1.738E-03	1316.	825.	517.	265.	1.738E-03	22.	0.	0.	0.	0.	0.
1.585E-03	1532.	1051.	696.	435.	1.585E-03	128.	0.	0.	0.	0.	0.
1.445E-03	1661.	1170.	924.	598.	1.445E-03	274.	4.	0.	0.	0.	0.
1.318E-03	2140.	1430.	1123.	777.	1.318E-03	407.	52.	0.	0.	0.	0.
1.202E-03	2348.	1584.	1298.	951.	1.202E-03	537.	95.	0.	0.	0.	0.
1.096E-03	2528.	1869.	1525.	1169.	1.096E-03	702.	175.	0.	0.	0.	0.
1.000E-03	2656.	2131.	1784.	1424.	1.000E-03	893.	282.	17.	0.	0.	0.
9.120E-04	2731.	2553.	2053.	1641.	9.120E-04	1078.	401.	32.	0.	0.	0.
8.318E-04	2793.	2770.	2315.	1938.	8.318E-04	1303.	551.	46.	0.	0.	0.
7.586E-04	3514.	3266.	2635.	2250.	7.586E-04	1548.	695.	74.	0.	0.	0.
6.918E-04	4266.	3901.	2978.	2569.	6.918E-04	1847.	848.	114.	0.	0.	0.
6.310E-04	4453.	4258.	3275.	2882.	6.310E-04	2195.	1079.	146.	40.	0.	0.
5.754E-04	4573.	4522.	3693.	3245.	5.754E-04	2544.	1366.	171.	95.	0.	0.
5.248E-04	4658.	4760.	4267.	3690.	5.248E-04	2893.	1707.	226.	111.	0.	0.
4.786E-04	4706.	4873.	4738.	4143.	4.786E-04	3279.	2086.	411.	215.	0.	0.
4.365E-04	4738.	4991.	5141.	4589.	4.365E-04	3660.	2440.	530.	265.	0.	0.
3.981E-04	4766.	5424.	5564.	4992.	3.981E-04	4097.	2848.	621.	321.	0.	0.
3.631E-04	4780.	5781.	5942.	5407.	3.631E-04	4582.	3328.	877.	419.	141.	0.
3.311E-04	4792.	6423.	6621.	5947.	3.311E-04	5082.	3867.	1204.	531.	269.	0.
3.020E-04	4802.	6506.	6933.	6367.	3.020E-04	5585.	4359.	1655.	811.	500.	0.
2.754E-04	4806.	6567.	7262.	6953.	2.754E-04	6102.	4996.	2287.	1287.	614.	36.
2.512E-04	4810.	6600.	7468.	7613.	2.512E-04	6639.	5534.	2884.	1627.	809.	251.
2.291E-04	4813.	6623.	7611.	8292.	2.291E-04	7283.	6155.	3588.	2276.	1165.	542.
2.089E-04	4813.	6641.	7732.	8673.	2.089E-04	7806.	6802.	4491.	3046.	1496.	1237.
1.905E-04	4813.	6654.	8382.	9328.	1.905E-04	8395.	7481.	5555.	3932.	2163.	1424.
1.738E-04	4813.	6658.	9226.	10112.	1.738E-04	9079.	8191.	6494.	5198.	2994.	2003.
1.585E-04	4813.	6661.	9357.	10586.	1.585E-04	9768.	8960.	7626.	6566.	4313.	2568.
1.445E-04	4813.	6666.	9409.	11019.	1.445E-04	10406.	9680.	8807.	7941.	5738.	3526.
1.318E-04	4813.	6667.	9461.	11377.	1.318E-04	10986.	10435.	10237.	9458.	7890.	5403.
1.202E-04	4813.	6667.	9485.	11526.	1.202E-04	11564.	11248.	11645.	11167.	9698.	7593.
1.096E-04	4813.	6667.	9506.	11769.	1.096E-04	12356.	12131.	12919.	12911.	12149.	9734.
1.000E-04	4813.	6667.	9522.	12392.	1.000E-04	13005.	12998.	14197.	14788.	14521.	13127.
9.120E-05	4813.	6667.	9524.	12946.	9.120E-05	13505.	13933.	15619.	16784.	16725.	16780.
8.318E-05	4813.	6667.	9525.	13839.	8.318E-05	13976.	14691.	17083.	18567.	19376.	20166.
7.586E-05	4813.	6667.	9531.	13927.	7.586E-05	14305.	15530.	18206.	20479.	21909.	23536.
6.918E-05	4813.	6667.	9533.	13976.	6.918E-05	14712.	16255.	19523.	21830.	24723.	27169.

6.310E-05	4813.	6667.	9533.	14011.	6.310E-05	15589.	17140.	20807.	23254.	27061.	29892.
5.754E-05	4813.	6667.	9533.	14034.	5.754E-05	16624.	18077.	22424.	24646.	29471.	32855.
5.248E-05	4813.	6667.	9533.	14052.	5.248E-05	16830.	18735.	23766.	26095.	31135.	35166.
4.786E-05	4813.	6667.	9533.	14063.	4.786E-05	16963.	19600.	25048.	27621.	32993.	36706.
4.365E-05	4813.	6667.	9533.	14063.	4.365E-05	17074.	20109.	26404.	28888.	34229.	38161.
3.981E-05	4813.	6667.	9533.	14064.	3.981E-05	17661.	20998.	27739.	30364.	35252.	39040.
3.631E-05	4813.	6667.	9533.	14074.	3.631E-05	17883.	21427.	28810.	31917.	36350.	40272.
3.311E-05	4813.	6667.	9533.	14075.	3.311E-05	17970.	22249.	29875.	33463.	37394.	40881.
3.020E-05	4813.	6667.	9533.	14075.	3.020E-05	17992.	23034.	30954.	34580.	38394.	41249.
2.754E-05	4813.	6667.	9533.	14075.	2.754E-05	18021.	23738.	31894.	35428.	39285.	41433.
2.512E-05	4813.	6667.	9533.	14075.	2.512E-05	18047.	23898.	32839.	36314.	39938.	41710.
2.291E-05	4813.	6667.	9533.	14075.	2.291E-05	18059.	24201.	33667.	37139.	40436.	41890.
2.089E-05	4813.	6667.	9533.	14075.	2.089E-05	18066.	25295.	34469.	37878.	40814.	41927.
1.905E-05	4813.	6667.	9533.	14075.	1.905E-05	18066.	25853.	35122.	38558.	41123.	41938.
1.738E-05	4813.	6667.	9533.	14075.	1.738E-05	18066.	26095.	35890.	39128.	41399.	41983.
1.585E-05	4813.	6667.	9533.	14075.	1.585E-05	18070.	26173.	36248.	39513.	41584.	41983.
1.445E-05	4813.	6667.	9533.	14075.	1.445E-05	18070.	26205.	36691.	39889.	41830.	41983.
1.318E-05	4813.	6667.	9533.	14075.	1.318E-05	18070.	26232.	37102.	40248.	42019.	41983.
1.202E-05	4813.	6667.	9533.	14075.	1.202E-05	18070.	26263.	37473.	40571.	42155.	41983.
1.096E-05	4813.	6667.	9533.	14075.	1.096E-05	18070.	26268.	37754.	40775.	42257.	41983.
1.000E-05	4813.	6667.	9533.	14075.	1.000E-05	18070.	26275.	38451.	40953.	42285.	41983.
9.120E-06	4813.	6667.	9533.	14075.	9.120E-06	18070.	26275.	38685.	41093.	42285.	41983.
8.318E-06	4813.	6667.	9533.	14075.	8.318E-06	18070.	26275.	38933.	41382.	42285.	41983.
7.586E-06	4813.	6667.	9533.	14075.	7.586E-06	18070.	26291.	39160.	41553.	42295.	41983.
6.918E-06	4813.	6667.	9533.	14075.	6.918E-06	18070.	26291.	39317.	41594.	42296.	41983.
6.310E-06	4813.	6667.	9533.	14075.	6.310E-06	18070.	26291.	39602.	41639.	42297.	41983.
5.754E-06	4813.	6667.	9533.	14075.	5.754E-06	18070.	26291.	39842.	41894.	42298.	41983.
5.248E-06	4813.	6667.	9533.	14075.	5.248E-06	18070.	26291.	40303.	41956.	42310.	41983.
4.786E-06	4813.	6667.	9533.	14075.	4.786E-06	18070.	26291.	40545.	41986.	42310.	41983.
4.365E-06	4813.	6667.	9533.	14075.	4.365E-06	18070.	26291.	40619.	42033.	42311.	41983.
3.981E-06	4813.	6667.	9533.	14075.	3.981E-06	18070.	26291.	40633.	42092.	42311.	41983.
3.631E-06	4813.	6667.	9533.	14075.	3.631E-06	18070.	26291.	40633.	42122.	42312.	41983.
3.311E-06	4813.	6667.	9533.	14075.	3.311E-06	18070.	26291.	40633.	42200.	42312.	41983.
3.020E-06	4813.	6667.	9533.	14075.	3.020E-06	18070.	26291.	40656.	42270.	42312.	41983.
2.754E-06	4813.	6667.	9533.	14075.	2.754E-06	18070.	26291.	40657.	42465.	42312.	41983.
2.512E-06	4813.	6667.	9533.	14075.	2.512E-06	18070.	26291.	40657.	42465.	42312.	41983.
2.291E-06	4813.	6667.	9533.	14075.	2.291E-06	18070.	26291.	40657.	42465.	42312.	41983.
2.089E-06	4813.	6667.	9533.	14075.	2.089E-06	18070.	26291.	40657.	42465.	42312.	41983.
1.905E-06	4813.	6667.	9533.	14075.	1.905E-06	18070.	26291.	40657.	42465.	42312.	41983.
1.738E-06	4813.	6667.	9533.	14075.	1.738E-06	18070.	26291.	40657.	42465.	42312.	41983.
1.585E-06	4813.	6667.	9533.	14075.	1.585E-06	18070.	26291.	40657.	42465.	42312.	41983.
1.445E-06	4813.	6667.	9533.	14075.	1.445E-06	18070.	26291.	40657.	42465.	42312.	41983.
1.318E-06	4813.	6667.	9533.	14075.	1.318E-06	18070.	26291.	40657.	42465.	42343.	41983.
1.202E-06	4813.	6667.	9533.	14075.	1.202E-06	18070.	26291.	40657.	42465.	42343.	41983.
1.096E-06	4813.	6667.	9533.	14075.	1.096E-06	18070.	26291.	40657.	42465.	42343.	41983.
1.000E-06	4813.	6667.	9533.	14075.	1.000E-06	18070.	26291.	40657.	42465.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/ 9/2004 at 13:52:29

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 48.5
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 032
Wind direction sector width (deg) = 90
Wind direction window (deg) = 347 - 077
Distance to intake (m) = 52.3
Intake height (m) = 48.5
Terrain elevation difference (m) = .0

Output file names
3RHtoCR1.log
3RHtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 4381
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 432
Hours direction not in window or calm = 38523

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	4813.	6667.	9533.	14075.	18070.	26291.	40657.	42465.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	38523.	36609.	33624.	28846.	24913.	16411.	1899.	73.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	11.11	15.41	22.09	32.79	42.04	61.57	95.54	99.83	100.00	100.00

95th PERCENTILE X/Q VALUES
1.30E-03 9.93E-04 8.80E-04 7.83E-04 6.39E-04 4.73E-04 2.82E-04 2.34E-04 1.92E-04 1.71E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.30E-03
2 to 8 hours 6.10E-04
8 to 24 hours 3.18E-04
1 to 4 days 2.19E-04
4 to 30 days 1.54E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.90E-03	2.38E-04
SECTOR-AVERAGE	1.82E-03	1.49E-04

NORMAL PROGRAM COMPLETION

Unit 2 Reactor Building Personnel Access Doors to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
 2583.60
    0.00
    0.00
    0.00
 152  90
   72.24
    0.00
    0.00
2PDtoCR1.log
2PDtoCR1.cfd
 .1
    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	0.	0.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	0.	0.	0.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	0.	0.	0.	0.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	0.	0.	0.	0.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	0.	0.	0.	0.	1.905E-03	0.	0.	0.	0.	0.	0.
1.738E-03	0.	0.	0.	0.	1.738E-03	0.	0.	0.	0.	0.	0.
1.585E-03	0.	0.	0.	0.	1.585E-03	0.	0.	0.	0.	0.	0.
1.445E-03	0.	0.	0.	0.	1.445E-03	0.	0.	0.	0.	0.	0.
1.318E-03	7.	3.	0.	0.	1.318E-03	0.	0.	0.	0.	0.	0.
1.202E-03	99.	54.	31.	13.	1.202E-03	0.	0.	0.	0.	0.	0.
1.096E-03	177.	144.	101.	42.	1.096E-03	2.	0.	0.	0.	0.	0.
1.000E-03	737.	526.	313.	175.	1.000E-03	8.	0.	0.	0.	0.	0.
9.120E-04	1134.	874.	603.	329.	9.120E-04	46.	0.	0.	0.	0.	0.
8.318E-04	1551.	1271.	890.	530.	8.318E-04	157.	0.	0.	0.	0.	0.
7.586E-04	2117.	1688.	1235.	814.	7.586E-04	299.	4.	0.	0.	0.	0.
6.918E-04	2880.	2254.	1677.	1135.	6.918E-04	475.	40.	0.	0.	0.	0.
6.310E-04	3421.	2746.	2210.	1590.	6.310E-04	740.	98.	0.	0.	0.	0.
5.754E-04	3877.	3275.	2729.	2091.	5.754E-04	1074.	190.	0.	0.	0.	0.
5.248E-04	4619.	3907.	3313.	2654.	5.248E-04	1465.	326.	0.	0.	0.	0.
4.786E-04	5025.	4385.	3966.	3288.	4.786E-04	1952.	554.	0.	0.	0.	0.
4.365E-04	6651.	5470.	4761.	4031.	4.365E-04	2549.	863.	0.	0.	0.	0.
3.981E-04	7525.	6202.	5567.	4725.	3.981E-04	3223.	1261.	10.	0.	0.	0.
3.631E-04	8108.	6805.	6121.	5406.	3.631E-04	3922.	1661.	54.	0.	0.	0.
3.311E-04	8222.	7124.	6739.	6144.	3.311E-04	4630.	2190.	113.	0.	0.	0.
3.020E-04	8277.	7480.	7304.	6810.	3.020E-04	5375.	2747.	198.	29.	0.	0.
2.754E-04	8287.	7950.	7756.	7525.	2.754E-04	6147.	3422.	354.	72.	0.	0.
2.512E-04	8291.	8287.	8203.	8178.	2.512E-04	6909.	4177.	614.	154.	0.	0.
2.291E-04	8292.	8918.	8763.	8843.	2.291E-04	7711.	5030.	931.	261.	0.	0.
2.089E-04	8294.	9761.	9460.	9556.	2.089E-04	8446.	6038.	1553.	514.	36.	0.
1.905E-04	8294.	10093.	9791.	10100.	1.905E-04	9221.	6987.	2224.	990.	156.	0.
1.738E-04	8295.	10468.	10230.	10733.	1.738E-04	9927.	8033.	3100.	1429.	395.	0.
1.585E-04	8295.	10512.	10509.	11368.	1.585E-04	10665.	9104.	4114.	2104.	754.	0.
1.445E-04	8295.	10517.	10779.	11756.	1.445E-04	11389.	10224.	5376.	3176.	1372.	11.
1.318E-04	8295.	10517.	11259.	12243.	1.318E-04	12108.	11341.	7104.	4802.	2263.	454.
1.202E-04	8295.	10517.	11589.	12688.	1.202E-04	12753.	12402.	8815.	7003.	4016.	1688.
1.096E-04	8295.	10517.	12532.	13449.	1.096E-04	13371.	13447.	10792.	9195.	6000.	3237.
1.000E-04	8295.	10517.	13018.	13878.	1.000E-04	13926.	14540.	12859.	11551.	8506.	5993.
9.120E-05	8295.	10518.	13416.	14312.	9.120E-05	14473.	15514.	14790.	13935.	11273.	9201.
8.318E-05	8295.	10518.	13496.	14575.	8.318E-05	15015.	16409.	16850.	16836.	15559.	14962.
7.586E-05	8295.	10518.	13508.	14836.	7.586E-05	15620.	17248.	18942.	19464.	19933.	20241.
6.918E-05	8295.	10518.	13513.	15275.	6.918E-05	16109.	18197.	20930.	21969.	23530.	25457.

6.310E-05	8295.	10518.	13513.	15601.	6.310E-05	16561.	18878.	22749.	24305.	26631.	29786.
5.754E-05	8295.	10518.	13513.	16232.	5.754E-05	16987.	19656.	24474.	26149.	29523.	32805.
5.248E-05	8295.	10518.	13513.	16972.	5.248E-05	17339.	20396.	26236.	28243.	31895.	35361.
4.786E-05	8295.	10518.	13513.	17237.	4.786E-05	17693.	21003.	27757.	30178.	33788.	37446.
4.365E-05	8295.	10518.	13513.	17573.	4.365E-05	18265.	21568.	29036.	31758.	35281.	38905.
3.981E-05	8295.	10518.	13513.	17604.	3.981E-05	18574.	22095.	30108.	33387.	36763.	39621.
3.631E-05	8295.	10518.	13513.	17613.	3.631E-05	19319.	22684.	31239.	34696.	37922.	39758.
3.311E-05	8295.	10518.	13513.	17613.	3.311E-05	19597.	23217.	32203.	35725.	38774.	40127.
3.020E-05	8295.	10518.	13513.	17613.	3.020E-05	19903.	23632.	33135.	36715.	39492.	40175.
2.754E-05	8295.	10518.	13513.	17613.	2.754E-05	20186.	24085.	33929.	37672.	40296.	40506.
2.512E-05	8295.	10518.	13513.	17613.	2.512E-05	20305.	24456.	34672.	38300.	40851.	40989.
2.291E-05	8295.	10518.	13513.	17613.	2.291E-05	20618.	24990.	35489.	38790.	41251.	41538.
2.089E-05	8295.	10518.	13513.	17613.	2.089E-05	20841.	25295.	36131.	39241.	41507.	41724.
1.905E-05	8295.	10518.	13513.	17613.	1.905E-05	20947.	25721.	36638.	39634.	41662.	41960.
1.738E-05	8295.	10518.	13513.	17613.	1.738E-05	20962.	26070.	37146.	39966.	41850.	41983.
1.585E-05	8295.	10518.	13513.	17613.	1.585E-05	20968.	26303.	37512.	40162.	41973.	41983.
1.445E-05	8295.	10518.	13513.	17613.	1.445E-05	20968.	26618.	37865.	40394.	42042.	41983.
1.318E-05	8295.	10518.	13513.	17613.	1.318E-05	20968.	26950.	38360.	40652.	42165.	41983.
1.202E-05	8295.	10518.	13513.	17613.	1.202E-05	20968.	27166.	38584.	40938.	42197.	41983.
1.096E-05	8295.	10518.	13513.	17613.	1.096E-05	20968.	27549.	38865.	41231.	42202.	41983.
1.000E-05	8295.	10518.	13513.	17613.	1.000E-05	20968.	27677.	39011.	41343.	42237.	41983.
9.120E-06	8295.	10518.	13513.	17613.	9.120E-06	20968.	27819.	39240.	41551.	42342.	41983.
8.318E-06	8295.	10518.	13513.	17613.	8.318E-06	20968.	27824.	39347.	41580.	42343.	41983.
7.586E-06	8295.	10518.	13513.	17613.	7.586E-06	20968.	27826.	39494.	41778.	42343.	41983.
6.918E-06	8295.	10518.	13513.	17613.	6.918E-06	20968.	27826.	39748.	41807.	42343.	41983.
6.310E-06	8295.	10518.	13513.	17613.	6.310E-06	20968.	27826.	39807.	41924.	42343.	41983.
5.754E-06	8295.	10518.	13513.	17613.	5.754E-06	20968.	27826.	39944.	41938.	42343.	41983.
5.248E-06	8295.	10518.	13513.	17613.	5.248E-06	20968.	27826.	39983.	42057.	42343.	41983.
4.786E-06	8295.	10518.	13513.	17613.	4.786E-06	20968.	27826.	40187.	42060.	42343.	41983.
4.365E-06	8295.	10518.	13513.	17613.	4.365E-06	20968.	27826.	40350.	42081.	42343.	41983.
3.981E-06	8295.	10518.	13513.	17613.	3.981E-06	20968.	27826.	40382.	42102.	42343.	41983.
3.631E-06	8295.	10518.	13513.	17613.	3.631E-06	20968.	27826.	40461.	42105.	42343.	41983.
3.311E-06	8295.	10518.	13513.	17613.	3.311E-06	20968.	27826.	40556.	42107.	42343.	41983.
3.020E-06	8295.	10518.	13513.	17613.	3.020E-06	20968.	27826.	40577.	42107.	42343.	41983.
2.754E-06	8295.	10518.	13513.	17613.	2.754E-06	20968.	27826.	40697.	42113.	42343.	41983.
2.512E-06	8295.	10518.	13513.	17613.	2.512E-06	20968.	27826.	40841.	42163.	42343.	41983.
2.291E-06	8295.	10518.	13513.	17613.	2.291E-06	20968.	27826.	40939.	42163.	42343.	41983.
2.089E-06	8295.	10518.	13513.	17613.	2.089E-06	20968.	27826.	40939.	42171.	42343.	41983.
1.905E-06	8295.	10518.	13513.	17613.	1.905E-06	20968.	27826.	40939.	42171.	42343.	41983.
1.738E-06	8295.	10518.	13513.	17613.	1.738E-06	20968.	27826.	40939.	42171.	42343.	41983.
1.585E-06	8295.	10518.	13513.	17613.	1.585E-06	20968.	27826.	40939.	42244.	42343.	41983.
1.445E-06	8295.	10518.	13513.	17613.	1.445E-06	20968.	27826.	40939.	42265.	42343.	41983.
1.318E-06	8295.	10518.	13513.	17613.	1.318E-06	20968.	27826.	40939.	42341.	42343.	41983.
1.202E-06	8295.	10518.	13513.	17613.	1.202E-06	20968.	27826.	40939.	42341.	42343.	41983.
1.096E-06	8295.	10518.	13513.	17613.	1.096E-06	20968.	27826.	40939.	42341.	42343.	41983.
1.000E-06	8295.	10518.	13513.	17613.	1.000E-06	20968.	27826.	40939.	42341.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/ 9/2004 at 13:42:35

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 152
Wind direction sector width (deg) = 90
Wind direction window (deg) = 107 - 197
Distance to intake (m) = 72.2
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
2PDtoCR1.log
2PDtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 7910
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 385
Hours direction not in window or calm = 35041

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	8295.	10518.	13513.	17613.	20968.	27826.	40939.	42341.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35041.	32758.	29644.	25308.	22015.	14876.	1617.	197.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	19.14	24.30	31.31	41.04	48.78	65.16	96.20	99.54	100.00	100.00

95th PERCENTILE X/Q VALUES

7.54E-04	7.02E-04	6.37E-04	5.70E-04	4.65E-04	3.34E-04	1.93E-04	1.58E-04	1.34E-04	1.17E-04	

95% X/Q for standard averaging intervals

0 to 2 hours	7.54E-04
2 to 8 hours	5.09E-04
8 to 24 hours	2.16E-04
1 to 4 days	1.46E-04
4 to 30 days	1.06E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.44E-03	1.88E-04
SECTOR-AVERAGE	9.02E-04	1.18E-04

NORMAL PROGRAM COMPLETION

Unit 3 Reactor Building Personnel Access Doors to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
 2583.60
    0.00
    0.00
    0.00
 336  90
   72.24
    0.00
    0.00
3PDtoCR1.log
3PDtoCR1.cfd
 .1
    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-03	0.	0.	0.	0.	9.120E-03	0.	0.	0.	0.	0.	0.
8.318E-03	0.	0.	0.	0.	8.318E-03	0.	0.	0.	0.	0.	0.
7.586E-03	0.	0.	0.	0.	7.586E-03	0.	0.	0.	0.	0.	0.
6.918E-03	0.	0.	0.	0.	6.918E-03	0.	0.	0.	0.	0.	0.
6.310E-03	0.	0.	0.	0.	6.310E-03	0.	0.	0.	0.	0.	0.
5.754E-03	0.	0.	0.	0.	5.754E-03	0.	0.	0.	0.	0.	0.
5.248E-03	0.	0.	0.	0.	5.248E-03	0.	0.	0.	0.	0.	0.
4.786E-03	0.	0.	0.	0.	4.786E-03	0.	0.	0.	0.	0.	0.
4.365E-03	0.	0.	0.	0.	4.365E-03	0.	0.	0.	0.	0.	0.
3.981E-03	0.	0.	0.	0.	3.981E-03	0.	0.	0.	0.	0.	0.
3.631E-03	0.	0.	0.	0.	3.631E-03	0.	0.	0.	0.	0.	0.
3.311E-03	0.	0.	0.	0.	3.311E-03	0.	0.	0.	0.	0.	0.
3.020E-03	0.	0.	0.	0.	3.020E-03	0.	0.	0.	0.	0.	0.
2.754E-03	0.	0.	0.	0.	2.754E-03	0.	0.	0.	0.	0.	0.
2.512E-03	0.	0.	0.	0.	2.512E-03	0.	0.	0.	0.	0.	0.
2.291E-03	0.	0.	0.	0.	2.291E-03	0.	0.	0.	0.	0.	0.
2.089E-03	0.	0.	0.	0.	2.089E-03	0.	0.	0.	0.	0.	0.
1.905E-03	0.	0.	0.	0.	1.905E-03	0.	0.	0.	0.	0.	0.
1.738E-03	0.	0.	0.	0.	1.738E-03	0.	0.	0.	0.	0.	0.
1.585E-03	0.	0.	0.	0.	1.585E-03	0.	0.	0.	0.	0.	0.
1.445E-03	4.	0.	0.	0.	1.445E-03	0.	0.	0.	0.	0.	0.
1.318E-03	44.	7.	0.	0.	1.318E-03	0.	0.	0.	0.	0.	0.
1.202E-03	422.	180.	60.	8.	1.202E-03	0.	0.	0.	0.	0.	0.
1.096E-03	738.	551.	297.	104.	1.096E-03	0.	0.	0.	0.	0.	0.
1.000E-03	3122.	2028.	1075.	465.	1.000E-03	16.	0.	0.	0.	0.	0.
9.120E-04	3943.	2701.	1641.	876.	9.120E-04	144.	0.	0.	0.	0.	0.
8.318E-04	4381.	3373.	2200.	1387.	8.318E-04	384.	0.	0.	0.	0.	0.
7.586E-04	5089.	3841.	3009.	1967.	7.586E-04	741.	15.	0.	0.	0.	0.
6.918E-04	5898.	4339.	3672.	2579.	6.918E-04	1226.	88.	0.	0.	0.	0.
6.310E-04	6312.	4687.	4220.	3328.	6.310E-04	1797.	232.	0.	0.	0.	0.
5.754E-04	6624.	5334.	4881.	4035.	5.754E-04	2446.	540.	0.	0.	0.	0.
5.248E-04	6901.	6416.	5773.	4865.	5.248E-04	3190.	879.	0.	0.	0.	0.
4.786E-04	7031.	7170.	6596.	5714.	4.786E-04	3979.	1373.	0.	0.	0.	0.
4.365E-04	7917.	7942.	7416.	6578.	4.365E-04	4816.	1974.	10.	0.	0.	0.
3.981E-04	8526.	8638.	8161.	7533.	3.981E-04	5740.	2691.	128.	0.	0.	0.
3.631E-04	9043.	9467.	8808.	8571.	3.631E-04	6668.	3529.	311.	4.	0.	0.
3.311E-04	9490.	10153.	9509.	9497.	3.311E-04	7668.	4530.	540.	68.	0.	0.
3.020E-04	9983.	10790.	10257.	10394.	3.020E-04	8711.	5638.	793.	219.	0.	0.
2.754E-04	10261.	11339.	10947.	11224.	2.754E-04	9742.	6742.	1214.	441.	0.	0.
2.512E-04	10502.	11696.	12130.	12218.	2.512E-04	10743.	7892.	1961.	1025.	74.	0.
2.291E-04	10626.	12331.	12850.	13049.	2.291E-04	11718.	9075.	2979.	1652.	463.	0.
2.089E-04	10715.	12846.	13480.	13817.	2.089E-04	12683.	10287.	4270.	2648.	1000.	25.
1.905E-04	10745.	13053.	13937.	14311.	1.905E-04	13540.	11617.	6182.	4007.	2176.	477.
1.738E-04	10753.	13261.	14444.	14939.	1.738E-04	14490.	13043.	8289.	5861.	4124.	2252.
1.585E-04	10755.	13303.	14778.	15450.	1.585E-04	15316.	14433.	10824.	8441.	6606.	5434.
1.445E-04	10758.	13332.	15073.	16028.	1.445E-04	16188.	15846.	13373.	11152.	9790.	9090.
1.318E-04	10761.	13346.	15499.	16828.	1.318E-04	16898.	17198.	16101.	14390.	13200.	12830.
1.202E-04	10761.	13350.	15728.	17512.	1.202E-04	17482.	18446.	18522.	18005.	16743.	16486.
1.096E-04	10761.	13351.	16544.	18278.	1.096E-04	18148.	19671.	21172.	21536.	20978.	20633.
1.000E-04	10761.	13351.	16857.	18780.	1.000E-04	18801.	20828.	23458.	24836.	24924.	25542.
9.120E-05	10761.	13352.	17109.	19319.	9.120E-05	19488.	21926.	26014.	27702.	29138.	29380.
8.318E-05	10761.	13352.	17182.	19792.	8.318E-05	20326.	22917.	27821.	29745.	31961.	33386.
7.586E-05	10761.	13352.	17210.	20191.	7.586E-05	20953.	23766.	29681.	31823.	34583.	36150.
6.918E-05	10761.	13352.	17234.	20713.	6.918E-05	21574.	24629.	31354.	33669.	36597.	37997.

6.310E-05	10761.	13352.	17238.	21045.	6.310E-05	22107.	25335.	32969.	35269.	38054.	38909.
5.754E-05	10761.	13352.	17239.	21767.	5.754E-05	22703.	26003.	34276.	36435.	39273.	39788.
5.248E-05	10761.	13352.	17240.	22346.	5.248E-05	23342.	26637.	35482.	37645.	40370.	41072.
4.786E-05	10761.	13352.	17241.	22613.	4.786E-05	23832.	27280.	36398.	38637.	40903.	41812.
4.365E-05	10761.	13352.	17241.	22859.	4.365E-05	24309.	27927.	37291.	39615.	41348.	41921.
3.981E-05	10761.	13352.	17241.	22898.	3.981E-05	24686.	28491.	37919.	40334.	41804.	41983.
3.631E-05	10761.	13352.	17241.	22919.	3.631E-05	25521.	29047.	38433.	40869.	42014.	41983.
3.311E-05	10761.	13352.	17241.	22922.	3.311E-05	25956.	29611.	39000.	41336.	42280.	41983.
3.020E-05	10761.	13352.	17241.	22924.	3.020E-05	26297.	30009.	39405.	41661.	42327.	41983.
2.754E-05	10761.	13352.	17241.	22925.	2.754E-05	26725.	30688.	39776.	41863.	42333.	41983.
2.512E-05	10761.	13352.	17241.	22925.	2.512E-05	26905.	31095.	40077.	41962.	42337.	41983.
2.291E-05	10761.	13352.	17241.	22926.	2.291E-05	27146.	31641.	40406.	42007.	42339.	41983.
2.089E-05	10761.	13352.	17241.	22926.	2.089E-05	27299.	32021.	40608.	42080.	42343.	41983.
1.905E-05	10761.	13352.	17241.	22926.	1.905E-05	27425.	32402.	40809.	42146.	42343.	41983.
1.738E-05	10761.	13352.	17241.	22926.	1.738E-05	27455.	32838.	41035.	42199.	42343.	41983.
1.585E-05	10761.	13352.	17241.	22926.	1.585E-05	27467.	33208.	41220.	42305.	42343.	41983.
1.445E-05	10761.	13352.	17241.	22926.	1.445E-05	27473.	33622.	41362.	42350.	42343.	41983.
1.318E-05	10761.	13352.	17241.	22926.	1.318E-05	27475.	34076.	41522.	42458.	42343.	41983.
1.202E-05	10761.	13352.	17241.	22926.	1.202E-05	27475.	34362.	41604.	42466.	42343.	41983.
1.096E-05	10761.	13352.	17241.	22926.	1.096E-05	27475.	34762.	41649.	42470.	42343.	41983.
1.000E-05	10761.	13352.	17241.	22926.	1.000E-05	27476.	34921.	41758.	42472.	42343.	41983.
9.120E-06	10761.	13352.	17241.	22926.	9.120E-06	27476.	35036.	41816.	42473.	42343.	41983.
8.318E-06	10761.	13352.	17241.	22926.	8.318E-06	27476.	35038.	41903.	42474.	42343.	41983.
7.586E-06	10761.	13352.	17241.	22926.	7.586E-06	27476.	35039.	41920.	42534.	42343.	41983.
6.918E-06	10761.	13352.	17241.	22926.	6.918E-06	27476.	35039.	41965.	42534.	42343.	41983.
6.310E-06	10761.	13352.	17241.	22926.	6.310E-06	27476.	35039.	42063.	42534.	42343.	41983.
5.754E-06	10761.	13352.	17241.	22926.	5.754E-06	27476.	35039.	42074.	42537.	42343.	41983.
5.248E-06	10761.	13352.	17241.	22926.	5.248E-06	27476.	35039.	42167.	42537.	42343.	41983.
4.786E-06	10761.	13352.	17241.	22926.	4.786E-06	27476.	35039.	42168.	42537.	42343.	41983.
4.365E-06	10761.	13352.	17241.	22926.	4.365E-06	27476.	35039.	42214.	42537.	42343.	41983.
3.981E-06	10761.	13352.	17241.	22926.	3.981E-06	27476.	35039.	42240.	42537.	42343.	41983.
3.631E-06	10761.	13352.	17241.	22926.	3.631E-06	27476.	35039.	42296.	42537.	42343.	41983.
3.311E-06	10761.	13352.	17241.	22926.	3.311E-06	27476.	35039.	42305.	42537.	42343.	41983.
3.020E-06	10761.	13352.	17241.	22926.	3.020E-06	27476.	35039.	42305.	42538.	42343.	41983.
2.754E-06	10761.	13352.	17241.	22926.	2.754E-06	27476.	35039.	42327.	42538.	42343.	41983.
2.512E-06	10761.	13352.	17241.	22926.	2.512E-06	27476.	35039.	42342.	42538.	42343.	41983.
2.291E-06	10761.	13352.	17241.	22926.	2.291E-06	27476.	35039.	42343.	42538.	42343.	41983.
2.089E-06	10761.	13352.	17241.	22926.	2.089E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.905E-06	10761.	13352.	17241.	22926.	1.905E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.738E-06	10761.	13352.	17241.	22926.	1.738E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.585E-06	10761.	13352.	17241.	22926.	1.585E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.445E-06	10761.	13352.	17241.	22926.	1.445E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.318E-06	10761.	13352.	17241.	22926.	1.318E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.202E-06	10761.	13352.	17241.	22926.	1.202E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.096E-06	10761.	13352.	17241.	22926.	1.096E-06	27476.	35039.	42343.	42538.	42343.	41983.
1.000E-06	10761.	13352.	17241.	22926.	1.000E-06	27476.	35039.	42343.	42538.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/ 9/2004 at 16:03:54

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 336
Wind direction sector width (deg) = 90
Wind direction window (deg) = 291 - 021
Distance to intake (m) = 72.2
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
3PDtoCR1.log
3PDtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 10376
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 385
Hours direction not in window or calm = 32575

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
LOW LIM.	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	10761.	13352.	17241.	22926.	27476.	35039.	42343.	42538.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	32575.	29924.	25916.	19995.	15507.	7663.	213.	0.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	24.83	30.85	39.95	53.41	63.92	82.05	99.50	100.00	100.00	100.00

95th PERCENTILE X/Q VALUES

1.04E-03	9.82E-04	8.38E-04	7.39E-04	6.01E-04	4.28E-04	2.48E-04	2.19E-04	1.91E-04	1.75E-04	

95% X/Q for standard averaging intervals

0 to 2 hours	1.04E-03
2 to 8 hours	6.39E-04
8 to 24 hours	2.72E-04
1 to 4 days	1.87E-04
4 to 30 days	1.64E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.52E-03	1.34E-04
SECTOR-AVERAGE	9.52E-04	8.41E-05

NORMAL PROGRAM COMPLETION

Unit 2 Railroad Bay Doors to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
   10.36
   28.04
  2
  1
    0.00
  2583.60
    0.00
    0.00
    0.00
 129  90
  100.80
    0.00
    0.00
2RDtoCR1.log
2RDtoCR1.cfd
 .1
    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
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X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	6.	1.	0.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	26.	17.	7.	0.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	217.	143.	92.	39.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	543.	381.	270.	149.	5.754E-04	11.	0.	0.	0.	0.	0.
5.248E-04	1271.	1001.	728.	437.	5.248E-04	48.	0.	0.	0.	0.	0.
4.786E-04	1854.	1567.	1229.	815.	4.786E-04	210.	0.	0.	0.	0.	0.
4.365E-04	2392.	2136.	1718.	1230.	4.365E-04	459.	22.	0.	0.	0.	0.
3.981E-04	3589.	2940.	2340.	1738.	3.981E-04	795.	75.	0.	0.	0.	0.
3.631E-04	4343.	3704.	2986.	2342.	3.631E-04	1179.	231.	0.	0.	0.	0.
3.311E-04	5120.	4290.	3671.	2955.	3.311E-04	1707.	434.	0.	0.	0.	0.
3.020E-04	6375.	5324.	4471.	3693.	3.020E-04	2256.	659.	12.	0.	0.	0.
2.754E-04	6878.	6019.	5298.	4478.	2.754E-04	2903.	964.	35.	0.	0.	0.
2.512E-04	7153.	6436.	6139.	5457.	2.512E-04	3670.	1469.	47.	0.	0.	0.
2.291E-04	9549.	8112.	7428.	6541.	2.291E-04	4512.	2052.	127.	0.	0.	0.
2.089E-04	10281.	8843.	8318.	7437.	2.089E-04	5478.	2701.	200.	49.	0.	0.
1.905E-04	10473.	9361.	8921.	8278.	1.905E-04	6474.	3455.	349.	96.	0.	0.
1.738E-04	10565.	9764.	9646.	9072.	1.738E-04	7446.	4279.	680.	182.	0.	0.
1.585E-04	10594.	10265.	10196.	9770.	1.585E-04	8376.	5190.	1044.	274.	8.	0.
1.445E-04	10604.	11140.	10765.	10557.	1.445E-04	9284.	6136.	1675.	465.	96.	0.
1.318E-04	10610.	11409.	11264.	11219.	1.318E-04	10132.	7218.	2344.	933.	355.	0.
1.202E-04	10612.	11807.	11540.	11863.	1.202E-04	10929.	8332.	3168.	1527.	623.	0.
1.096E-04	10614.	12681.	12178.	12628.	1.096E-04	11664.	9524.	4261.	2482.	967.	141.
1.000E-04	10615.	12711.	12435.	13194.	1.000E-04	12440.	10684.	5794.	3732.	1701.	685.
9.120E-05	10615.	12747.	12797.	13634.	9.120E-05	13170.	11956.	7374.	5220.	2676.	1496.
8.318E-05	10615.	12748.	13183.	14361.	8.318E-05	13961.	13228.	9283.	7470.	4404.	2644.
7.586E-05	10615.	12748.	13972.	14973.	7.586E-05	14663.	14435.	11222.	9873.	7301.	4704.
6.918E-05	10615.	12748.	14380.	15427.	6.918E-05	15297.	15540.	13455.	12585.	10650.	7924.
6.310E-05	10615.	12748.	14659.	15813.	6.310E-05	15986.	16681.	15621.	15044.	13738.	11503.
5.754E-05	10615.	12748.	15525.	16435.	5.754E-05	16529.	17760.	18017.	17645.	17025.	16820.
5.248E-05	10615.	12748.	15694.	16646.	5.248E-05	17135.	18721.	20030.	20460.	21107.	22556.
4.786E-05	10615.	12748.	15727.	16973.	4.786E-05	17721.	19667.	21975.	23120.	24534.	27004.
4.365E-05	10615.	12748.	15736.	17289.	4.365E-05	18261.	20470.	23821.	25393.	27750.	30258.
3.981E-05	10615.	12748.	15736.	17699.	3.981E-05	18653.	21251.	25673.	27720.	30696.	33451.
3.631E-05	10615.	12748.	15736.	18452.	3.631E-05	19224.	21945.	27083.	29722.	32801.	35620.
3.311E-05	10615.	12748.	15736.	18798.	3.311E-05	19599.	22715.	28827.	31709.	34703.	37489.
3.020E-05	10615.	12748.	15736.	19006.	3.020E-05	19960.	23333.	30139.	33427.	36335.	38703.
2.754E-05	10615.	12748.	15736.	19938.	2.754E-05	20330.	23909.	31533.	34864.	37466.	39532.
2.512E-05	10615.	12748.	15736.	19962.	2.512E-05	20870.	24561.	32580.	36033.	38502.	39775.
2.291E-05	10615.	12748.	15736.	19994.	2.291E-05	21447.	25119.	33825.	37060.	39269.	40100.
2.089E-05	10615.	12748.	15736.	19994.	2.089E-05	21745.	25504.	34924.	38033.	40323.	40829.
1.905E-05	10615.	12748.	15736.	19994.	1.905E-05	22250.	25895.	35661.	38752.	41074.	41337.
1.738E-05	10615.	12748.	15736.	19994.	1.738E-05	22517.	26450.	36200.	39284.	41501.	41676.
1.585E-05	10615.	12748.	15736.	19994.	1.585E-05	22678.	26844.	36995.	39912.	41720.	41772.
1.445E-05	10615.	12748.	15736.	19994.	1.445E-05	22818.	27223.	37469.	40285.	41860.	41953.
1.318E-05	10615.	12748.	15736.	19994.	1.318E-05	22907.	27514.	38026.	40884.	42053.	41983.
1.202E-05	10615.	12748.	15736.	19994.	1.202E-05	23341.	28062.	38349.	41098.	42231.	41983.
1.096E-05	10615.	12748.	15736.	19994.	1.096E-05	23427.	28288.	38784.	41228.	42263.	41983.
1.000E-05	10615.	12748.	15736.	19994.	1.000E-05	23449.	28548.	39214.	41366.	42297.	41983.
9.120E-06	10615.	12748.	15736.	19994.	9.120E-06	23452.	28974.	39548.	41484.	42308.	41983.
8.318E-06	10615.	12748.	15736.	19994.	8.318E-06	23452.	29122.	39717.	41582.	42328.	41983.
7.586E-06	10615.	12748.	15736.	19994.	7.586E-06	23452.	29335.	39931.	41822.	42330.	41983.
6.918E-06	10615.	12748.	15736.	19994.	6.918E-06	23452.	29492.	40126.	41869.	42332.	41983.

6.310E-06	10615.	12748.	15736.	19994.	6.310E-06	23452.	29581.	40331.	41933.	42335.	41983.
5.754E-06	10615.	12748.	15736.	19994.	5.754E-06	23452.	30134.	40572.	42061.	42336.	41983.
5.248E-06	10615.	12748.	15736.	19994.	5.248E-06	23452.	30157.	40629.	42132.	42337.	41983.
4.786E-06	10615.	12748.	15736.	19994.	4.786E-06	23452.	30168.	40743.	42142.	42342.	41983.
4.365E-06	10615.	12748.	15736.	19994.	4.365E-06	23452.	30168.	40879.	42174.	42342.	41983.
3.981E-06	10615.	12748.	15736.	19994.	3.981E-06	23452.	30168.	40910.	42271.	42343.	41983.
3.631E-06	10615.	12748.	15736.	19994.	3.631E-06	23452.	30168.	41134.	42301.	42343.	41983.
3.311E-06	10615.	12748.	15736.	19994.	3.311E-06	23452.	30168.	41181.	42350.	42343.	41983.
3.020E-06	10615.	12748.	15736.	19994.	3.020E-06	23452.	30168.	41251.	42374.	42343.	41983.
2.754E-06	10615.	12748.	15736.	19994.	2.754E-06	23452.	30168.	41276.	42403.	42343.	41983.
2.512E-06	10615.	12748.	15736.	19994.	2.512E-06	23452.	30168.	41299.	42406.	42343.	41983.
2.291E-06	10615.	12748.	15736.	19994.	2.291E-06	23452.	30168.	41337.	42414.	42343.	41983.
2.089E-06	10615.	12748.	15736.	19994.	2.089E-06	23452.	30168.	41372.	42460.	42343.	41983.
1.905E-06	10615.	12748.	15736.	19994.	1.905E-06	23452.	30168.	41383.	42460.	42343.	41983.
1.738E-06	10615.	12748.	15736.	19994.	1.738E-06	23452.	30168.	41398.	42466.	42343.	41983.
1.585E-06	10615.	12748.	15736.	19994.	1.585E-06	23452.	30168.	41444.	42468.	42343.	41983.
1.445E-06	10615.	12748.	15736.	19994.	1.445E-06	23452.	30168.	41670.	42468.	42343.	41983.
1.318E-06	10615.	12748.	15736.	19994.	1.318E-06	23452.	30168.	41670.	42468.	42343.	41983.
1.202E-06	10615.	12748.	15736.	19994.	1.202E-06	23452.	30168.	41670.	42468.	42343.	41983.
1.096E-06	10615.	12748.	15736.	19994.	1.096E-06	23452.	30168.	41670.	42468.	42343.	41983.
1.000E-06	10615.	12748.	15736.	19994.	1.000E-06	23452.	30168.	41670.	42469.	42343.	41983.
9.120E-07	10615.	12748.	15736.	19994.	9.120E-07	23452.	30168.	41670.	42469.	42343.	41983.
8.318E-07	10615.	12748.	15736.	19994.	8.318E-07	23452.	30168.	41670.	42490.	42343.	41983.
7.586E-07	10615.	12748.	15736.	19994.	7.586E-07	23452.	30168.	41670.	42490.	42343.	41983.
6.918E-07	10615.	12748.	15736.	19994.	6.918E-07	23452.	30168.	41670.	42490.	42343.	41983.
6.310E-07	10615.	12748.	15736.	19994.	6.310E-07	23452.	30168.	41670.	42490.	42343.	41983.
5.754E-07	10615.	12748.	15736.	19994.	5.754E-07	23452.	30168.	41670.	42490.	42343.	41983.
5.248E-07	10615.	12748.	15736.	19994.	5.248E-07	23452.	30168.	41670.	42490.	42343.	41983.
4.786E-07	10615.	12748.	15736.	19994.	4.786E-07	23452.	30168.	41670.	42490.	42343.	41983.
4.365E-07	10615.	12748.	15736.	19994.	4.365E-07	23452.	30168.	41670.	42490.	42343.	41983.
3.981E-07	10615.	12748.	15736.	19994.	3.981E-07	23452.	30168.	41670.	42490.	42343.	41983.
3.631E-07	10615.	12748.	15736.	19994.	3.631E-07	23452.	30168.	41670.	42490.	42343.	41983.
3.311E-07	10615.	12748.	15736.	19994.	3.311E-07	23452.	30168.	41670.	42490.	42343.	41983.
3.020E-07	10615.	12748.	15736.	19994.	3.020E-07	23452.	30168.	41670.	42490.	42343.	41983.
2.754E-07	10615.	12748.	15736.	19994.	2.754E-07	23452.	30168.	41670.	42490.	42343.	41983.
2.512E-07	10615.	12748.	15736.	19994.	2.512E-07	23452.	30168.	41670.	42490.	42343.	41983.
2.291E-07	10615.	12748.	15736.	19994.	2.291E-07	23452.	30168.	41670.	42490.	42343.	41983.
2.089E-07	10615.	12748.	15736.	19994.	2.089E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.905E-07	10615.	12748.	15736.	19994.	1.905E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.738E-07	10615.	12748.	15736.	19994.	1.738E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.585E-07	10615.	12748.	15736.	19994.	1.585E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.445E-07	10615.	12748.	15736.	19994.	1.445E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.318E-07	10615.	12748.	15736.	19994.	1.318E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.202E-07	10615.	12748.	15736.	19994.	1.202E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.096E-07	10615.	12748.	15736.	19994.	1.096E-07	23452.	30168.	41670.	42490.	42343.	41983.
1.000E-07	10615.	12748.	15736.	19994.	1.000E-07	23452.	30168.	41670.	42490.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
e-mail: jyl1@nrc.gov
J. J. Hayes Phone: (301) 415 3167
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/10/2004 at 12:03:15

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 129
Wind direction sector width (deg) = 90
Wind direction window (deg) = 084 - 174
Distance to intake (m) = 100.8
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
2RDtoCR1.log
2RDtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 10230
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 385
Hours direction not in window or calm = 32721

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	10615.	12748.	15736.	19994.	23452.	30168.	41670.	42490.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	32721.	30528.	27421.	22927.	19531.	12534.	886.	48.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	24.49	29.46	36.46	46.58	54.56	70.65	97.92	99.89	100.00	100.00

95th PERCENTILE X/Q VALUES

4.54E-04	4.35E-04	4.09E-04	3.74E-04	3.08E-04	2.27E-04	1.36E-04	1.14E-04	9.62E-05	8.70E-05

95% X/Q for standard averaging intervals

0 to 2 hours	4.54E-04
2 to 8 hours	3.48E-04
8 to 24 hours	1.53E-04
1 to 4 days	1.06E-04
4 to 30 days	7.95E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	7.65E-04	1.02E-04
SECTOR-AVERAGE	4.79E-04	6.37E-05

NORMAL PROGRAM COMPLETION

Unit 3 Railroad Bay Doors to Control Room Intake

```
5
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET
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   28.04
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  1
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 2583.60
    0.00
    0.00
    0.00
 359  90
  100.80
    0.00
    0.00
3RDtoCR1.log
3RDtoCR1.cfd
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    0.22
    4.00
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
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X/Q CUMULATIVE FREQUENCY DISTRIBUTIONS

XOQ	1	2	4	8	XOQ	12	24	96	168	360	720
Abv. Lim.	0.	0.	0.	0.	Abv. Lim.	0.	0.	0.	0.	0.	0.
9.120E-04	0.	0.	0.	0.	9.120E-04	0.	0.	0.	0.	0.	0.
8.318E-04	0.	0.	0.	0.	8.318E-04	0.	0.	0.	0.	0.	0.
7.586E-04	5.	0.	0.	0.	7.586E-04	0.	0.	0.	0.	0.	0.
6.918E-04	17.	6.	0.	0.	6.918E-04	0.	0.	0.	0.	0.	0.
6.310E-04	223.	114.	61.	14.	6.310E-04	0.	0.	0.	0.	0.	0.
5.754E-04	677.	386.	196.	79.	5.754E-04	0.	0.	0.	0.	0.	0.
5.248E-04	1472.	879.	438.	200.	5.248E-04	21.	0.	0.	0.	0.	0.
4.786E-04	1879.	1235.	691.	360.	4.786E-04	83.	0.	0.	0.	0.	0.
4.365E-04	2147.	1585.	987.	564.	4.365E-04	164.	0.	0.	0.	0.	0.
3.981E-04	2903.	1961.	1389.	819.	3.981E-04	299.	11.	0.	0.	0.	0.
3.631E-04	3327.	2261.	1762.	1101.	3.631E-04	477.	30.	0.	0.	0.	0.
3.311E-04	3644.	2514.	2131.	1484.	3.311E-04	719.	74.	0.	0.	0.	0.
3.020E-04	4300.	3104.	2563.	1894.	3.020E-04	1000.	147.	0.	0.	0.	0.
2.754E-04	4458.	3793.	3128.	2363.	2.754E-04	1342.	256.	0.	0.	0.	0.
2.512E-04	4552.	4247.	3614.	2876.	2.512E-04	1767.	456.	0.	0.	0.	0.
2.291E-04	5315.	4917.	4351.	3478.	2.291E-04	2246.	706.	2.	0.	0.	0.
2.089E-04	5887.	5482.	4963.	4160.	2.089E-04	2802.	1002.	28.	0.	0.	0.
1.905E-04	6248.	6226.	5524.	4951.	1.905E-04	3385.	1422.	55.	0.	0.	0.
1.738E-04	6659.	6802.	6091.	5650.	1.738E-04	4093.	1891.	147.	0.	0.	0.
1.585E-04	7033.	7340.	6682.	6310.	1.585E-04	4785.	2463.	256.	0.	0.	0.
1.445E-04	7250.	8212.	7507.	7021.	1.445E-04	5593.	3101.	358.	40.	0.	0.
1.318E-04	7422.	8498.	8254.	7726.	1.318E-04	6425.	3856.	542.	165.	0.	0.
1.202E-04	7533.	8703.	8694.	8366.	1.202E-04	7145.	4662.	809.	371.	0.	0.
1.096E-04	7578.	9227.	9208.	9212.	1.096E-04	7903.	5454.	1279.	624.	65.	0.
1.000E-04	7596.	9390.	9659.	9727.	1.000E-04	8693.	6302.	2023.	940.	201.	0.
9.120E-05	7602.	9477.	10088.	10151.	9.120E-05	9418.	7236.	2904.	1372.	379.	0.
8.318E-05	7604.	9535.	10451.	10686.	8.318E-05	10154.	8299.	4086.	2329.	699.	0.
7.586E-05	7609.	9596.	11325.	11546.	7.586E-05	11002.	9339.	5231.	3459.	1289.	239.
6.918E-05	7610.	9643.	11646.	12255.	6.918E-05	11655.	10472.	6672.	4764.	1877.	1009.
6.310E-05	7610.	9657.	11824.	12843.	6.310E-05	12253.	11663.	8150.	6376.	3674.	1691.
5.754E-05	7610.	9673.	12300.	13438.	5.754E-05	12867.	12811.	10124.	8465.	5576.	3263.
5.248E-05	7610.	9680.	12608.	13775.	5.248E-05	13607.	13977.	11886.	10393.	8389.	5653.
4.786E-05	7610.	9682.	12697.	14312.	4.786E-05	14411.	15113.	13792.	12755.	10919.	8862.
4.365E-05	7610.	9682.	12752.	14798.	4.365E-05	15109.	16022.	15722.	15371.	14434.	12880.
3.981E-05	7610.	9682.	12811.	15263.	3.981E-05	15692.	16988.	17613.	18063.	17806.	17061.
3.631E-05	7610.	9682.	12848.	16271.	3.631E-05	16361.	17966.	19568.	20394.	21304.	22475.
3.311E-05	7610.	9682.	12872.	16649.	3.311E-05	16905.	18773.	21549.	22789.	24789.	26951.
3.020E-05	7610.	9682.	12878.	16754.	3.020E-05	17424.	19495.	23391.	25162.	27683.	30607.
2.754E-05	7610.	9682.	12890.	17526.	2.754E-05	17996.	20383.	25012.	27469.	30567.	33778.
2.512E-05	7610.	9682.	12892.	17759.	2.512E-05	18863.	21227.	26762.	29558.	33432.	36102.
2.291E-05	7610.	9682.	12892.	17837.	2.291E-05	19372.	22123.	28629.	31414.	35293.	38497.
2.089E-05	7610.	9682.	12892.	17876.	2.089E-05	19756.	22764.	30082.	32905.	37269.	39862.
1.905E-05	7610.	9682.	12892.	17916.	1.905E-05	20402.	23368.	31748.	34187.	38903.	40718.
1.738E-05	7610.	9682.	12892.	17961.	1.738E-05	21068.	24078.	32888.	35628.	39710.	41316.
1.585E-05	7610.	9682.	12892.	17973.	1.585E-05	21358.	24743.	33908.	36846.	40397.	41599.
1.445E-05	7610.	9682.	12892.	17975.	1.445E-05	21601.	25450.	34770.	38110.	41061.	41940.
1.318E-05	7610.	9682.	12892.	17982.	1.318E-05	21766.	26056.	35468.	38943.	41505.	41983.
1.202E-05	7610.	9682.	12892.	17984.	1.202E-05	22006.	26878.	36310.	39641.	41641.	41983.
1.096E-05	7610.	9682.	12892.	17984.	1.096E-05	22237.	27281.	36979.	40144.	41881.	41983.
1.000E-05	7610.	9682.	12892.	17984.	1.000E-05	22294.	27690.	37649.	40450.	42099.	41983.
9.120E-06	7610.	9682.	12892.	17984.	9.120E-06	22317.	28589.	38055.	40756.	42182.	41983.
8.318E-06	7610.	9682.	12892.	17984.	8.318E-06	22340.	29058.	38484.	40988.	42256.	41983.
7.586E-06	7610.	9682.	12892.	17984.	7.586E-06	22360.	29577.	38824.	41377.	42322.	41983.
6.918E-06	7610.	9682.	12892.	17984.	6.918E-06	22375.	29956.	39347.	41637.	42343.	41983.

6.310E-06	7610.	9682.	12892.	17984.	6.310E-06	22376.	30130.	39558.	41762.	42343.	41983.
5.754E-06	7610.	9682.	12892.	17984.	5.754E-06	22379.	30669.	40018.	41989.	42343.	41983.
5.248E-06	7610.	9682.	12892.	17984.	5.248E-06	22381.	30898.	40238.	42093.	42343.	41983.
4.786E-06	7610.	9682.	12892.	17984.	4.786E-06	22381.	30922.	40441.	42106.	42343.	41983.
4.365E-06	7610.	9682.	12892.	17984.	4.365E-06	22381.	30933.	40607.	42241.	42343.	41983.
3.981E-06	7610.	9682.	12892.	17984.	3.981E-06	22381.	30947.	40740.	42270.	42343.	41983.
3.631E-06	7610.	9682.	12892.	17984.	3.631E-06	22381.	30986.	41018.	42337.	42343.	41983.
3.311E-06	7610.	9682.	12892.	17984.	3.311E-06	22381.	30988.	41394.	42389.	42343.	41983.
3.020E-06	7610.	9682.	12892.	17984.	3.020E-06	22381.	30988.	41448.	42422.	42343.	41983.
2.754E-06	7610.	9682.	12892.	17984.	2.754E-06	22381.	30989.	41473.	42444.	42343.	41983.
2.512E-06	7610.	9682.	12892.	17984.	2.512E-06	22381.	30989.	41511.	42449.	42343.	41983.
2.291E-06	7610.	9682.	12892.	17984.	2.291E-06	22381.	30989.	41607.	42449.	42343.	41983.
2.089E-06	7610.	9682.	12892.	17984.	2.089E-06	22381.	30989.	41639.	42453.	42343.	41983.
1.905E-06	7610.	9682.	12892.	17984.	1.905E-06	22381.	30989.	41707.	42515.	42343.	41983.
1.738E-06	7610.	9682.	12892.	17984.	1.738E-06	22381.	30989.	41712.	42515.	42343.	41983.
1.585E-06	7610.	9682.	12892.	17984.	1.585E-06	22381.	30989.	41774.	42515.	42343.	41983.
1.445E-06	7610.	9682.	12892.	17984.	1.445E-06	22381.	30989.	41905.	42515.	42343.	41983.
1.318E-06	7610.	9682.	12892.	17984.	1.318E-06	22381.	30989.	41957.	42515.	42343.	41983.
1.202E-06	7610.	9682.	12892.	17984.	1.202E-06	22381.	30989.	41958.	42515.	42343.	41983.
1.096E-06	7610.	9682.	12892.	17984.	1.096E-06	22381.	30989.	41961.	42538.	42343.	41983.
1.000E-06	7610.	9682.	12892.	17984.	1.000E-06	22381.	30989.	41961.	42538.	42343.	41983.
9.120E-07	7610.	9682.	12892.	17984.	9.120E-07	22381.	30989.	41961.	42538.	42343.	41983.
8.318E-07	7610.	9682.	12892.	17984.	8.318E-07	22381.	30989.	41961.	42538.	42343.	41983.
7.586E-07	7610.	9682.	12892.	17984.	7.586E-07	22381.	30989.	41961.	42538.	42343.	41983.
6.918E-07	7610.	9682.	12892.	17984.	6.918E-07	22381.	30989.	41961.	42538.	42343.	41983.
6.310E-07	7610.	9682.	12892.	17984.	6.310E-07	22381.	30989.	41961.	42538.	42343.	41983.
5.754E-07	7610.	9682.	12892.	17984.	5.754E-07	22381.	30989.	41961.	42538.	42343.	41983.
5.248E-07	7610.	9682.	12892.	17984.	5.248E-07	22381.	30989.	41961.	42538.	42343.	41983.
4.786E-07	7610.	9682.	12892.	17984.	4.786E-07	22381.	30989.	41961.	42538.	42343.	41983.
4.365E-07	7610.	9682.	12892.	17984.	4.365E-07	22381.	30989.	41961.	42538.	42343.	41983.
3.981E-07	7610.	9682.	12892.	17984.	3.981E-07	22381.	30989.	41961.	42538.	42343.	41983.
3.631E-07	7610.	9682.	12892.	17984.	3.631E-07	22381.	30989.	41961.	42538.	42343.	41983.
3.311E-07	7610.	9682.	12892.	17984.	3.311E-07	22381.	30989.	41961.	42538.	42343.	41983.
3.020E-07	7610.	9682.	12892.	17984.	3.020E-07	22381.	30989.	41961.	42538.	42343.	41983.
2.754E-07	7610.	9682.	12892.	17984.	2.754E-07	22381.	30989.	41961.	42538.	42343.	41983.
2.512E-07	7610.	9682.	12892.	17984.	2.512E-07	22381.	30989.	41961.	42538.	42343.	41983.
2.291E-07	7610.	9682.	12892.	17984.	2.291E-07	22381.	30989.	41961.	42538.	42343.	41983.
2.089E-07	7610.	9682.	12892.	17984.	2.089E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.905E-07	7610.	9682.	12892.	17984.	1.905E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.738E-07	7610.	9682.	12892.	17984.	1.738E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.585E-07	7610.	9682.	12892.	17984.	1.585E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.445E-07	7610.	9682.	12892.	17984.	1.445E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.318E-07	7610.	9682.	12892.	17984.	1.318E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.202E-07	7610.	9682.	12892.	17984.	1.202E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.096E-07	7610.	9682.	12892.	17984.	1.096E-07	22381.	30989.	41961.	42538.	42343.	41983.
1.000E-07	7610.	9682.	12892.	17984.	1.000E-07	22381.	30989.	41961.	42538.	42343.	41983.
Belw. Lim.	0.	0.	0.	0.	Belw. Lim.	0.	0.	0.	0.	0.	0.

Program Title: ARCON96.

Developed For: U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Reactor Program Management

Date: June 25, 1997 11:00 a.m.

NRC Contacts: J. Y. Lee Phone: (301) 415 1080
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 12/10/2004 at 12:03:54

******* ARCON INPUT **********

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\PEACHB~1\ARCON\T1AA84~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA85~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA86~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA87~1.MET
C:\TRACI'~1\PEACHB~1\ARCON\T1AA88~1.MET

Height of lower wind instrument (m) = 10.4
Height of upper wind instrument (m) = 28.0
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2583.6
Effluent vertical velocity (m/s) = .00
Vent or stack flow (m^3/s) = .00
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 359
Wind direction sector width (deg) = 90
Wind direction window (deg) = 314 - 044
Distance to intake (m) = 100.8
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
3RDtoCR1.log
3RDtoCR1.cfd

Minimum Wind Speed (m/s) = .2
Surface roughness length (m) = .10
Sector averaging constant = 4.0

Initial value of sigma y = .00
Initial value of sigma z = .00

Expanded output for code testing not selected

Total number of hours of data processed = 43800
Hours of missing data = 464
Hours direction in window = 7225
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 385
Hours direction not in window or calm = 35726

DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

AVER. PER.	1	2	4	8	12	24	96	168	360	720
UPPER LIM.	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
LOW LIM.	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07	1.00E-07
ABOVE RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
IN RANGE	7610.	9682.	12892.	17984.	22381.	30989.	41961.	42538.	42343.	41983.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35726.	33594.	30265.	24937.	20602.	11713.	595.	0.	0.	0.
TOTAL X/Qs	43336.	43276.	43157.	42921.	42983.	42702.	42556.	42538.	42343.	41983.
% NON ZERO	17.56	22.37	29.87	41.90	52.07	72.57	98.60	100.00	100.00	100.00

95th PERCENTILE X/Q VALUES

4.36E-04	3.74E-04	3.29E-04	2.88E-04	2.34E-04	1.67E-04	9.90E-05	8.49E-05	6.84E-05	6.17E-05

95% X/Q for standard averaging intervals

0 to 2 hours	4.36E-04
2 to 8 hours	2.38E-04
8 to 24 hours	1.07E-04
1 to 4 days	7.62E-05
4 to 30 days	5.59E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	7.65E-04	7.24E-05
SECTOR-AVERAGE	4.79E-04	4.54E-05

NORMAL PROGRAM COMPLETION