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November 11, 2003

Docket Nos.: 50-348  
50-364

NL-03-2292

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant Units 1 and 2  
Response to Request for Additional Information Related to  
Request to Revise Technical Specifications – Containment Equipment Hatch

Ladies and Gentlemen:

On October 16, 2003, Southern Nuclear Operating Company, Inc (SNC) held a conference call with the NRC Staff related to SNC submittal dated August 29, 2003. The August submittal requested changes to the Farley Nuclear Plant (FNP) Technical Specifications (TS) to allow the equipment hatch to be open during core alterations and/or during movement of irradiated fuel assemblies within containment. During the conference call, the NRC requested that SNC provide additional information related to this change request. Enclosed with this letter is the SNC response to this NRC request.

A statement of the NRC questions and the SNC response is provided in Enclosure 1. Supporting information is provided in Enclosures 2 and 3 as follows: A printout from the ARCON96 computer code is provided in Enclosure 2. A Compact Disc (CD) containing the meteorological data files used as input to the ARCON96 computer code is provided in Enclosure 3.

(Affirmation and signature are on the following page).

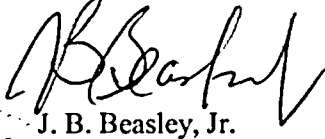
A001

Mr. J. B. Beasley, Jr. states he is a Vice President of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

This letter contains no NRC commitments. If you have any questions, please advise.

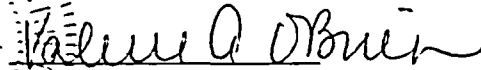
Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY



J. B. Beasley, Jr.

Sworn to and subscribed before me this 10 day of November, 2003.



Valerie A. O'Brien  
Notary Public

My commission expires: 4-28-07

JBB/WAS/sdl

Enclosure 1 – Response to NRC Request for Additional Information  
Enclosure 2 – ACRON96 Output  
Enclosure 3 – CD Containing Meteorological Data Files

cc: Southern Nuclear Operating Company  
Mr. J. D. Woodard, Executive Vice President  
Mr. D. E. Grissette, General Manager – Plant Farley  
Document Services RTYPE: CFA04.054; LC# 13866

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. F. Rinaldi, NRR Project Manager – Farley  
Mr. T. P. Johnson, Senior Resident Inspector – Farley

Alabama Department of Public Health  
Dr. D. E. Williamson, State Health Officer

**Joseph M. Farley Nuclear Plant Units 1 and 2  
Response to Request for Additional Information Related to  
Request to Revise Technical Specifications – Containment Equipment Hatch**

**Enclosure 1**

**Response to NRC Request for Additional Information**

**Joseph M. Farley Nuclear Plant Units 1 and 2  
Response to Request for Additional Information Related to  
Request to Revise Technical Specifications – Containment Equipment Hatch**

**Enclosure 1**

**Response to NRC Request for Additional Information**

**NRC Question 1:**

Provide meteorological data: Please provide an electronic copy of the meteorological data file(s) used as input to the ARCON96 computer code to recalculate the control room X/Q values. Please also describe the period-of-record and measurement heights used as well as how atmospheric stability class was determined.

**SNC Response 1:**

Enclosure 3 of this letter provides a CD which contains the raw meteorological data from the site (file RAWMETDATA.zip) and the data in ARCON96 format (file ASIIMETDATA.zip). These data were taken from January 2000 through December 2002. Wind speed and direction were measured at 35 feet and 150 feet above grade and temperatures were measured at 35 feet and 200 feet above grade. Stability class is based on the Delta T (°F) from the measurements at 35 feet and 200 feet. The following table relates Delta T to Stability Class:

| <u>Delta T</u> | <u>Stability Class</u> |
|----------------|------------------------|
| < -1.74        | A                      |
| -1.74 to -1.56 | B                      |
| -1.56 to -1.38 | C                      |
| -1.38 to -0.46 | D                      |
| -0.46 to 1.38  | E                      |
| 1.38 to 3.60   | F                      |
| > 3.60         | G                      |

**NRC Question 2:**

Describe inputs, assumptions and bases: [a] Please describe the specific inputs, assumptions and bases used with the ARCON96 methodology. A copy of the ARCON96 printouts is acceptable to show inputs. [b] Was the physical height of the release location assumed? [c] Are the distances the shortest distance from the postulated release location to the intake location? [d] Are all directional inputs defined in terms of true north? References to figures showing structures, dimensions, and distances may also be helpful in describing the postulated transport of the effluent. [e] If the figures are drawn to plant or magnetic north, what is the relationship to true north?

**SNC Response 2:**

- a. A copy of the ARCON96 output is provided in Enclosure 2.
- b. The physical heights of the release and intake points were considered in the calculation of the distance between the release and intake points as follows:

| <u>Release/Intake</u> | <u>Elevation (ft) Above Sea Level</u>  |
|-----------------------|--|
| CR intake             | 192                                    |
| TSC intake            | 177                                    |
| Vent stack            | 300                                    |
| Hatch door            | 163.25                                 |
| Reactor building      | 192 for Control Room (CR)              |
| Reactor building      | 177 for Technical Support Center (TSC) |

- c. Yes, distances are the shortest distance between postulated release and intake.
- d. Directions are defined in terms of true north and shown in Figure 1 of Enclosure 2. Drawing references used in specifying distances and directions are provided in Table 1 of Enclosure 2.
- e. Directions are defined in terms of true north. No additional information is required.

**Joseph M. Farley Nuclear Plant Units 1 and 2  
Response to Request for Additional Information Related to  
Request to Revise Technical Specifications – Containment Equipment Hatch**

**Enclosure 2**

**ACRON96 Output**

**Attachment C from BM-03-0018-001, sheets 1-36**

**Figure 1 (sheet 8 from BM-03-0018-001)**

**Table 1 (sheet 5 from BM-03-0018-001)**

## Unit 1 CR X/Q Estimates for Unit 1 Vent Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316  
e-mail: j\_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

The program was prepared for an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibilities for any third party's use, or the results of such use, of any portion of this program or represents that its use by such third party would not infringe privately owned rights.

Program Run 5/21/2003 at 11:15:43

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 32.9  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00  
Direction .. intake to source (deg) = 115  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 070 - 160  
Distance to intake (m) = 69.4  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
CIV1.out  
CIV1.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

ENCLOSURE 2  
ACRON96 Output (36 sheets)

## Unit 1 CR X/Q Estimates for Unit 1 Vent Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 3287  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 269  
 Hours direction not in window or calm = 22572

## 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    | 3556.    | 4739.    | 6485.    | 8965.    | 10799.   | 14299.   | 22820.   | 25072.   | 25634.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 2.       | 0.       | 0.       |
| ZERO        | 22572.   | 21368.   | 19580.   | 17019.   | 15168.   | 11508.   | 2852.    | 895.     | 11.      | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 13.61    | 18.15    | 24.88    | 34.50    | 41.59    | 55.41    | 88.89    | 96.55    | 99.96    | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.10E-03 | 1.02E-03 | 8.46E-04 | 7.35E-04 | 6.08E-04 | 4.57E-04 | 2.80E-04 | 2.24E-04 | 1.83E-04 | 1.55E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.10E-03 |
| 2 to 8 hours  | 6.15E-04 |
| 8 to 24 hours | 3.18E-04 |
| 1 to 4 days   | 2.21E-04 |
| 4 to 30 days  | 1.35E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 3.48E-03 | 1.87E-04 |
| SECTOR-AVERAGE | 1.68E-03 | 1.17E-04 |

NORMAL PROGRAM COMPLETION



## Unit 1 CR X/Q Estimates for Unit 1 Reactor Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316  
e-mail: j\_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

The program was prepared for an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibilities for any third party's use, or the results of such use, of any portion of this program or represents that its use by such third party would not infringe privately owned rights.

Program Run 6/ 5/2003 at 12:38:47

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = .0  
Building Area (m<sup>2</sup>) = 887.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 136  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 091 - 181  
Distance to intake (m) = 39.2  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
CIR1.out  
CIR1.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 1 CR X/Q Estimates for Unit 1 Reactor Release

Initial value of sigma y = 3.48  
 Initial value of sigma z = 3.54

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
 Hours of missing data = 176  
 Hours direction in window = 2340  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 23494

## DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

| AVG. 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    | 2634.    | 3576.    | 5071.    | 7326.    | 9060.    | 12658.   | 21565.   | 24664.   | 25535.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 23494.   | 22531.   | 20994.   | 18658.   | 16907.   | 13149.   | 4107.    | 1305.    | 110.     | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 10.08    | 13.70    | 19.46    | 28.19    | 34.89    | 49.05    | 84.00    | 94.97    | 99.57    | 100.00   |

## 95th PERCENTILE X/Q VALUES

| 1        | 2        | 4        | 8        | 12       | 24       | 96       | 168      | 360      | 720      |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.61E-03 | 1.09E-03 | 1.01E-03 | 9.13E-04 | 7.48E-04 | 5.63E-04 | 3.37E-04 | 2.95E-04 | 2.45E-04 | 2.07E-04 |

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.61E-03 |
| 2 to 8 hours  | 6.81E-04 |
| 8 to 24 hours | 3.88E-04 |
| 1 to 4 days   | 2.62E-04 |
| 4 to 30 days  | 1.86E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.31E-03 | 3.74E-04 |
| SECTOR-AVERAGE | 1.45E-03 | 2.34E-04 |

NORMAL PROGRAM COMPLETION

## Unit 1 CR X/Q Estimates for Unit 1 Hatch Door Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

Code Developer: J. V. Ramsdell Phone: (509) 372 6316  
e-mail: j\_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

The program was prepared for an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibilities for any third party's use, or the results of such use, of any portion of this program or represents that its use by such third party would not infringe privately owned rights.

Program Run 6/ 5/2003 at 12:39:13

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 8.8  
Building Area (m<sup>2</sup>) = 1253.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 136  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 091 - 181  
Distance to intake (m) = 80.9  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
CIN1.out  
CIN1.jfd

Minimum Wind Speed (m/s) = .9  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 1 CR X/Q Estimates for Unit 1 Hatch Door Release

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

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
 Hours of missing data = 176  
 Hours direction in window = 2340  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 23494

| 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  | 2634.    | 3576.    | 5071.    | 7326.    | 9060.    | 12658.   | 21565.   | 24663.   | 25535.   | 25647.   |
| BELOW RANGE                                     | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 1.       | 0.       | 0.       |
| ZERO  | 23494.   | 22531.   | 20994.   | 18658.   | 16907.   | 13149.   | 4107.    | 1305.    | 110.     | 0.       |
| TOTAL X/Qs                                      | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO                                      | 10.08    | 13.70    | 19.46    | 28.19    | 34.89    | 49.05    | 84.00    | 94.97    | 99.57    | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 7.78E-04 | 5.19E-04 | 4.70E-04 | 4.16E-04 | 3.49E-04 | 2.62E-04 | 1.66E-04 | 1.40E-04 | 1.20E-04 | 9.92E-05 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 7.78E-04 |
| 2 to 8 hours  | 2.96E-04 |
| 8 to 24 hours | 1.85E-04 |
| 1 to 4 days   | 1.35E-04 |
| 4 to 30 days  | 8.89E-05 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 1.25E-03 | 1.74E-04 |
| SECTOR-AVERAGE | 7.84E-04 | 1.09E-04 |

NORMAL PROGRAM COMPLETION

## Unit 1 CR X/Q Estimates for Unit 2 Vent Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

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 5/21/2003 at 13:35:24

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 32.9  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 066  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 021 - 111  
Distance to intake (m) = 69.2  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
CIV2.out  
CIV2.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 1 CR X/Q Estimates for Unit 2 Vent Release

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

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
Hours of missing data = 176  
Hours direction in window = 6073  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 269  
Hours direction not in window or calm = 19786

## 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    | 6342.    | 8082.    | 10356.   | 13112.   | 14942.   | 18215.   | 23738.   | 24958.   | 24825.   | 25178.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 377.     | 386.     |
| ZERO        | 19786.   | 18025.   | 15709.   | 12872.   | 11025.   | 7592.    | 1934.    | 1011.    | 443.     | 83.      |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 24.27    | 30.96    | 39.73    | 50.46    | 57.54    | 70.58    | 92.47    | 96.11    | 98.27    | 99.68    |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.15E-03 | 1.10E-03 | 1.03E-03 | 9.56E-04 | 8.04E-04 | 6.25E-04 | 4.22E-04 | 3.66E-04 | 3.17E-04 | 2.69E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.15E-03 |
| 2 to 8 hours  | 8.91E-04 |
| 8 to 24 hours | 4.59E-04 |
| 1 to 4 days   | 3.54E-04 |
| 4 to 30 days  | 2.46E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 3.50E-03 | 2.01E-04 |
| SECTOR-AVERAGE | 1.69E-03 | 1.26E-04 |

NORMAL PROGRAM COMPLETION

## Unit 1 CR X/Q Estimates for Unit 2 Reactor Release

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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J. J. Hayes Phone: (301) 415 3167  
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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 6/ 5/2003 at 12:39:23

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = .0  
Building Area (m<sup>2</sup>) = 887.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 042  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 357 - 087  
Distance to intake (m) = 39.2  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
C1R2.out  
C1R2.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 1 CR X/Q Estimates for Unit 2 Reactor Release

Initial value of sigma y = 3.48  
 Initial value of sigma z = 3.54

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
 Hours of missing data = 176  
 Hours direction in window = 7955  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 17879

## DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

| AVR. 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    | 8249.    | 10522.   | 13181.   | 16054.   | 17851.   | 20621.   | 24375.   | 29200.   | 25158.   | 25450.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 70.      |
| ZERO        | 17879.   | 15585.   | 12884.   | 9930.    | 8116.    | 5186.    | 1297.    | 769.     | 487.     | 127.     |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 31.57    | 40.30    | 50.57    | 61.78    | 68.74    | 79.90    | 94.95    | 97.04    | 98.10    | 99.50    |

## 95th PERCENTILE X/Q VALUES

| 1        | 2        | 4        | 8        | 12       | 24       | 96       | 168      | 360      | 720      |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.81E-03 | 1.77E-03 | 1.69E-03 | 1.55E-03 | 1.30E-03 | 1.04E-03 | 7.48E-04 | 6.65E-04 | 5.80E-04 | 5.32E-04 |

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.81E-03 |
| 2 to 8 hours  | 1.47E-03 |
| 8 to 24 hours | 7.87E-04 |
| 1 to 4 days   | 6.50E-04 |
| 4 to 30 days  | 4.98E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.31E-03 | 4.05E-04 |
| SECTOR-AVERAGE | 1.45E-03 | 2.54E-04 |

NORMAL PROGRAM COMPLETION



## Unit 1 CR X/Q Estimates for Unit 2 Hatch Door Release

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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J. J. Hayes Phone: (301) 415 3167  
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L. A. Brown Phone: (301) 415 1232  
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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 6/ 5/2003 at 12:39:35

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 8.8  
Building Area (m<sup>2</sup>) = 1253.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 043  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 358 - 088  
Distance to intake (m) = 82.5  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
C1N2.out  
C1N2.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 1 CR X/Q Estimates for Unit 2 Hatch Door Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 7827  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 18007

## 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-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 |
| LOW LIM.    | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 |
| ABOVE RANGE | 0.       | 0.       | 0.       | 0.       | 2.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| IN RANGE    | 8121.    | 10365.   | 13026.   | 15914.   | 17709.   | 20490.   | 24343.   | 25200.   | 25158.   | 25520.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 18007.   | 15742.   | 13039.   | 10070.   | 8256.    | 5317.    | 1329.    | 769.     | 487.     | 127.     |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 31.08    | 39.70    | 49.98    | 61.25    | 68.21    | 79.40    | 94.82    | 97.04    | 98.10    | 99.50    |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 8.12E-04 | 7.75E-04 | 7.27E-04 | 6.77E-04 | 5.73E-04 | 4.50E-04 | 3.15E-04 | 2.77E-04 | 2.40E-04 | 2.17E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 8.12E-04 |
| 2 to 8 hours  | 6.31E-04 |
| 8 to 24 hours | 3.37E-04 |
| 1 to 4 days   | 2.70E-04 |
| 4 to 30 days  | 2.02E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 1.21E-03 | 1.82E-04 |
| SECTOR-AVERAGE | 7.56E-04 | 1.14E-04 |

NORMAL PROGRAM COMPLETION

## Unit 2 CR X/Q Estimates for Unit 1 Vent Release

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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J. J. Mayes Phone: (301) 415 3167  
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L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

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 5/21/2003 at 13:35:56

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 32.9  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 116  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 071 - 161  
Distance to intake (m) = 70.2  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
C2V1.out  
C2V1.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 1 Vent Release

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 = 26304  
Hours of missing data = 176  
Hours direction in window = 3210  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 269  
Hours direction not in window or calm = 22649

## 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    | 3479.    | 4640.    | 6367.    | 8832.    | 10644.   | 14121.   | 22618.   | 24969.   | 25634.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 2.       | 0.       | 0.       |
| ZERO        | 22649.   | 21467.   | 19698.   | 17152.   | 15323.   | 11686.   | 3054.    | 998.     | 11.      | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 13.32    | 17.77    | 24.43    | 33.99    | 40.99    | 54.72    | 88.10    | 96.16    | 99.96    | 100.00   |

## 95th PERCENTILE X/Q VALUES

| 1.06E-03 | 1.00E-03 | 8.18E-04 | 7.13E-04 | 5.92E-04 | 4.44E-04 | 2.71E-04 | 2.16E-04 | 1.73E-04 | 1.49E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.06E-03 |
| 2 to 8 hours  | 5.97E-04 |
| 8 to 24 hours | 3.10E-04 |
| 1 to 4 days   | 2.13E-04 |
| 4 to 30 days  | 1.31E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 3.42E-03 | 1.83E-04 |
| SECTOR-AVERAGE | 1.65E-03 | 1.15E-04 |

NORMAL PROGRAM COMPLETION

## Unit 2 CR X/Q Estimates for Unit 1 Reactor Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:00

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = .0  
Building Area (m<sup>2</sup>) = 887.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 138  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 093 - 183  
Distance to intake (m) = 40.3  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
C2R1.out  
C2R1.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 1 Reactor Release

Initial value of sigma y = 3.48  
 Initial value of sigma z = 3.54

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
 Hours of missing data = 176  
 Hours direction in window = 2282  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 23552

## 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    | 2576.    | 3498.    | 4957.    | 7151.    | 8829.    | 12364.   | 21439.   | 24605.   | 25535.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 23552.   | 22609.   | 21108.   | 18833.   | 17138.   | 13443.   | 4233.    | 1364.    | 110.     | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 9.86     | 13.40    | 19.02    | 27.52    | 34.00    | 47.91    | 83.51    | 94.75    | 99.57    | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.53E-03 | 1.02E-03 | 9.59E-04 | 8.66E-04 | 7.17E-04 | 5.33E-04 | 3.24E-04 | 2.82E-04 | 2.30E-04 | 1.97E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.53E-03 |
| 2 to 8 hours  | 6.46E-04 |
| 8 to 24 hours | 3.67E-04 |
| 1 to 4 days   | 2.55E-04 |
| 4 to 30 days  | 1.78E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.23E-03 | 3.60E-04 |
| SECTOR-AVERAGE | 1.40E-03 | 2.26E-04 |

NORMAL PROGRAM COMPLETION

## Unit 2 CR X/Q Estimates for Unit 1 Hatch Door Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:39:45

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3

Meteorological Data File Names

Farley00.met

Farley01.met

Farley02.met

Height of lower wind instrument (m) = 10.0

Height of upper wind instrument (m) = 61.0

Wind speeds entered as meters/second

Ground-level release

Release height (m) = 8.8

Building Area (m<sup>2</sup>) = 1253.0

Effluent vertical velocity (m/s) = .00

Vent or stack flow (m<sup>3</sup>/s) = .00

Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 137

Wind direction sector width (deg) = 90

Wind direction window (deg) = 092 - 182

Distance to intake (m) = 82.6

Intake height (m) = .0

Terrain elevation difference (m) = .0

Output file names

C2M1.out

C2M1.jfd

Minimum Wind Speed (m/s) = .5

Surface roughness length (m) = .20

Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 1 Hatch Door Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 2310  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 23524

| DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL |          |          |          |          |          |          |          |          |          |          |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| AVR. 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  | 2604.    | 3537.    | 5001.    | 7207.    | 8895.    | 12430.   | 21475.   | 24671.   | 25534.   | 25647.   |
| BELOW RANGE                                     | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 1.       | 1.       | 0.       |
| ZERO  | 23524.   | 22570.   | 21064.   | 18777.   | 17072.   | 13377.   | 4197.    | 1297.    | 110.     | 0.       |
| TOTAL X/Qs                                      | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO                                      | 9.97     | 13.55    | 19.19    | 27.74    | 34.26    | 48.17    | 83.65    | 95.01    | 99.57    | 100.00   |

95th PERCENTILE X/Q VALUES  
 7.43E-04 5.02E-04 4.52E-04 3.98E-04 3.33E-04 2.51E-04 1.61E-04 1.37E-04 1.15E-04 9.58E-05

95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 7.43E-04 |
| 2 to 8 hours  | 2.83E-04 |
| 8 to 24 hours | 1.78E-04 |
| 1 to 4 days   | 1.31E-04 |
| 4 to 30 days  | 8.58E-05 |

| HOURLY VALUE RANGE |          |          |
|--------------------|----------|----------|
|                    | MAX X/Q  | MIN X/Q  |
| CENTERLINE         | 1.20E-03 | 1.67E-04 |
| SECTOR-AVERAGE     | 7.53E-04 | 1.05E-04 |

NORMAL PROGRAM COMPLETION



## Unit 2 CR X/Q Estimates for Unit 2 Vent Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
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L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

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 5/21/2003 at 13:36:33

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 32.9  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 067  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 022 - 112  
Distance to intake (m) = 69.9  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
C2V2.out  
C2V2.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 2 Vent Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 6021  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 269  
 Hours direction not in window or calm = 19838

## 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    | 6290.    | 8017.    | 10276.   | 13022.   | 14848.   | 18133.   | 23750.   | 24958.   | 24825.   | 25178.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 377.     | 386.     |
| ZERO        | 19838.   | 18090.   | 15789.   | 12962.   | 11119.   | 7674.    | 1922.    | 1011.    | 443.     | 83.      |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 24.07    | 30.71    | 39.42    | 50.12    | 57.18    | 70.26    | 92.51    | 96.11    | 98.27    | 99.68    |

## 95th PERCENTILE X/Q VALUES

| 1        | 2        | 4        | 8        | 12       | 24       | 96       | 168      | 360      | 720      |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.11E-03 | 1.07E-03 | 1.01E-03 | 9.39E-04 | 7.88E-04 | 6.13E-04 | 4.16E-04 | 3.59E-04 | 3.13E-04 | 2.60E-04 |

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.11E-03 |
| 2 to 8 hours  | 8.81E-04 |
| 8 to 24 hours | 4.50E-04 |
| 1 to 4 days   | 3.50E-04 |
| 4 to 30 days  | 2.36E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 3.44E-03 | 1.98E-04 |
| SECTOR-AVERAGE | 1.67E-03 | 1.24E-04 |

NORMAL PROGRAM COMPLETION

## Unit 2 CR X/Q Estimates for Unit 2 Reactor Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:12

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = .0  
Building Area (m<sup>2</sup>) = 887.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 045  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 000 - 090  
Distance to intake (m) = 40.5  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
C2R2.out  
C2R2.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 2 Reactor Release

Initial value of sigma y = 3.48  
Initial value of sigma z = 3.54

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
Hours of missing data = 176  
Hours direction in window = 7498  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 294  
Hours direction not in window or calm = 16336

| 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  | 7792.    | 9966.    | 12560.   | 15484.   | 17327.   | 20140.   | 24248.   | 25198.   | 25158.   | 25378.   |
| BELOW RANGE                                     | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 142.     |
| ZERO  | 18336.   | 16141.   | 13505.   | 10500.   | 8640.    | 5667.    | 1424.    | 771.     | 487.     | 127.     |
| TOTAL X/Qs                                      | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO                                      | 29.82    | 38.17    | 48.19    | 59.59    | 66.73    | 78.04    | 94.45    | 97.03    | 98.10    | 99.50    |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.75E-03 | 1.69E-03 | 1.60E-03 | 1.47E-03 | 1.34E-03 | 9.84E-04 | 7.00E-04 | 6.26E-04 | 5.38E-04 | 4.87E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.75E-03 |
| 2 to 8 hours  | 1.38E-03 |
| 8 to 24 hours | 7.40E-04 |
| 1 to 4 days   | 6.05E-04 |
| 4 to 30 days  | 4.55E-04 |

|                | HOURLY VALUE RANGE |          |
|----------------|--------------------|----------|
|                | MAX X/Q            | MIN X/Q  |
| CENTERLINE     | 2.22E-03           | 3.87E-04 |
| SECTOR-AVERAGE | 1.39E-03           | 2.43E-04 |

NORMAL PROGRAM COMPLETION

## Unit 2 CR X/Q Estimates for Unit 2 Hatch Door Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:21

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = 8.8  
Building Area (m<sup>2</sup>) = 1253.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 045  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 000 - 090  
Distance to intake (m) = 81.2  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
C2H2.out  
C2H2.jfdMinimum Wind Speed (m/s) = .3  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## Unit 2 CR X/Q Estimates for Unit 2 Hatch Door Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 7698  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 18336

## 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-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 | 1.00E-03 |
| LOW LIM.    | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 | 1.00E-07 |
| ABOVE RANGE | 0.       | 0.       | 0.       | 0.       | 3.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| IN RANGE    | 7792.    | 9966.    | 12560.   | 15484.   | 17324.   | 20140.   | 24248.   | 25198.   | 25158.   | 25520.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 1136.    | 0.       | 487.     | 127.     |
| ZERO        | 18336.   | 16141.   | 13505.   | 10500.   | 8640.    | 5667.    | 288.     | 771.     | 0.       | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 29.82    | 38.17    | 48.19    | 59.59    | 66.73    | 78.04    | 98.88    | 97.03    | 100.00   | 100.00   |

## 95th PERCENTILE X/Q VALUES

8.42E-04 8.02E-04 7.47E-04 6.93E-04 5.87E-04 4.60E-04 3.22E-04 2.83E-04 2.43E-04 2.19E-04

## 95% X/Q for standard averaging intervals

0 to 2 hours 8.42E-04  
 2 to 8 hours 6.43E-04  
 8 to 24 hours 3.44E-04  
 1 to 4 days 2.76E-04  
 4 to 30 days 2.03E-04

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 1.24E-03 | 1.87E-04 |
| SECTOR-AVERAGE | 7.79E-04 | 1.17E-04 |

NORMAL PROGRAM COMPLETION

## TSC X/Q Estimates for Unit 1 Vent Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.gov

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 5/21/2003 at 13:36:58

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.met

Height of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/second

Ground-level release  
Release height (m) = 37.5  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 141  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 096 - 186  
Distance to intake (m) = 79.6  
Intake height (m) = .0  
Terrain elevation difference (m) = .0

Output file names  
T2V1.out  
T2V1.jfd

Minimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 1 Vent Release

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 = 26304  
Hours of missing data = 176  
Hours direction in window = 6275  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 607  
Hours direction not in window or calm = 19246

## DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

| AVR. PER.   | 1        | 2        | 4        | 8        | 12       | 24       | 96       | 168      | 360      | 720      |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| UPPER LTM.  | 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 LTM.    | 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    | 6882.    | 8581.    | 10861.   | 13616.   | 15447.   | 18609.   | 24186.   | 25678.   | 25645.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 19246.   | 17526.   | 15204.   | 12368.   | 10520.   | 7198.    | 1486.    | 291.     | 0.       | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 26.34    | 32.87    | 41.67    | 52.40    | 59.49    | 72.11    | 94.21    | 98.88    | 100.00   | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 9.63E-04 | 9.30E-04 | 8.93E-04 | 8.37E-04 | 6.96E-04 | 5.25E-04 | 3.53E-04 | 3.20E-04 | 2.78E-04 | 2.41E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 9.63E-04 |
| 2 to 8 hours  | 7.95E-04 |
| 8 to 24 hours | 3.69E-04 |
| 1 to 4 days   | 2.95E-04 |
| 4 to 30 days  | 2.23E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.66E-03 | 1.10E-04 |
| SECTOR-AVERAGE | 1.15E-03 | 6.89E-05 |

NORMAL PROGRAM COMPLETION



## TSC X/Q Estimates for Unit 1 Reactor Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:44

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = .0  
Building Area (m<sup>2</sup>) = 1078.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 157  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 112 - 202  
Distance to intake (m) = 57.6  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
T2R1.out  
T2R1.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 1 Vent Release

Initial value of sigma y = 3.48  
Initial value of sigma s = 4.30

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
Hours of missing data = 176  
Hours direction in window = 1889  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 294  
Hours direction not in window or calm = 23945

## DISTRIBUTION SUMMARY DATA BY AVERAGING INTERVAL

| AVG. 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    | 2183.    | 2979.    | 4150.    | 5900.    | 7283.    | 10293.   | 18958.   | 23063.   | 25180.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 239.     | 0.       |
| ZERO        | 23945.   | 23128.   | 21915.   | 20084.   | 18684.   | 15514.   | 6714.    | 2906.    | 226.     | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 8.36     | 11.41    | 15.92    | 22.71    | 28.05    | 39.88    | 73.85    | 88.81    | 99.12    | 100.00   |

## 95th PERCENTILE X/Q VALUES

| 1        | 2        | 4        | 8        | 12       | 24       | 96       | 168      | 360      | 720      |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 7.72E-04 | 5.09E-04 | 4.92E-04 | 4.50E-04 | 3.74E-04 | 2.73E-04 | 1.71E-04 | 1.53E-04 | 1.19E-04 | 1.06E-04 |

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 7.72E-04 |
| 2 to 8 hours  | 3.43E-04 |
| 8 to 24 hours | 1.85E-04 |
| 1 to 4 days   | 1.37E-04 |
| 4 to 30 days  | 9.60E-05 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 1.27E-03 | 1.81E-04 |
| SECTOR-AVERAGE | 7.99E-04 | 1.14E-04 |

NORMAL PROGRAM COMPLETION

## TSC X/Q Estimates for Unit 1 Hatch Door Release

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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e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:31

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = -4.2  
Building Area (m<sup>2</sup>) = 1253.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 157  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 112 - 202  
Distance to intake (m) = 100.8  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
T2M1.out  
T2M1.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 1 Hatch Door Release

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 = 26304  
 Hours of missing data = 176  
 Hours direction in window = 1889  
 Hours elevated plume w/ dir. in window = 0  
 Hours of calm winds = 294  
 Hours direction not in window or calm = 23945

## 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    | 2183.    | 2979.    | 4150.    | 5900.    | 7283.    | 10293.   | 18958.   | 23063.   | 25419.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 23945.   | 23128.   | 21915.   | 20084.   | 18684.   | 15514.   | 6714.    | 2906.    | 226.     | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 8.36     | 11.41    | 15.92    | 22.71    | 28.05    | 39.88    | 73.85    | 88.81    | 99.12    | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 4.31E-04 | 2.93E-04 | 2.74E-04 | 2.46E-04 | 2.13E-04 | 1.60E-04 | 1.00E-04 | 9.12E-05 | 7.17E-05 | 6.29E-05 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 4.31E-04 |
| 2 to 8 hours  | 1.84E-04 |
| 8 to 24 hours | 1.17E-04 |
| 1 to 4 days   | 8.00E-05 |
| 4 to 30 days  | 5.72E-05 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 8.31E-04 | 1.02E-04 |
| SECTOR-AVERAGE | 5.21E-04 | 6.41E-05 |

NORMAL PROGRAM COMPLETION

## TSC X/Q Estimates for Unit 2 Vent Release

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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e-mail: lab2@nrc.govCode Developer: J. V. Ramsdell Phone: (509) 372 6316  
e-mail: j\_vramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 5/21/2003 at 13:40:03

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = 37.5  
Building Area (m<sup>2</sup>) = .0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 096  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 051 - 141  
Distance to intake (m) = 60.0  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
T2V2.out  
T2V2.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 2 Vent Release

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 = 26304  
Hours of missing data = 176  
Hours direction in window = 5518  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 607  
Hours direction not in window or calm = 20003

## 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    | 6125.    | 7709.    | 9805.    | 12452.   | 14304.   | 17608.   | 24312.   | 25702.   | 25645.   | 25647.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 20003.   | 18398.   | 16260.   | 13532.   | 11663.   | 8199.    | 1360.    | 267.     | 0.       | 0.       |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 23.44    | 29.53    | 37.62    | 47.92    | 55.09    | 68.23    | 94.70    | 98.97    | 100.00   | 100.00   |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.46E-03 | 1.39E-03 | 1.32E-03 | 1.23E-03 | 1.02E-03 | 7.64E-04 | 4.70E-04 | 3.97E-04 | 3.46E-04 | 3.11E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.46E-03 |
| 2 to 8 hours  | 1.15E-03 |
| 8 to 24 hours | 5.33E-04 |
| 1 to 4 days   | 3.73E-04 |
| 4 to 30 days  | 2.86E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.79E-03 | 2.01E-04 |
| SECTOR-AVERAGE | 1.75E-03 | 1.26E-04 |

NORMAL PROGRAM COMPLETION

## TSC X/Q Estimates for Unit 2 Reactor Release

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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L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/ 5/2003 at 12:40:54

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3

Meteorological Data File Names

Farley00.met

Farley01.met

Farley02.met

Height of lower wind instrument (m) = 10.0

Height of upper wind instrument (m) = 61.0

Wind speeds entered as meters/second

Ground-level release

Release height (m) = .0

Building Area (m<sup>2</sup>) = 1078.0

Effluent vertical velocity (m/s) = .00

Vent or stack flow (m<sup>3</sup>/s) = .00

Vent or stack radius (m) = .00

Direction .. intake to source (deg) = 066

Wind direction sector width (deg) = 90

Wind direction window (deg) = 021 - 111

Distance to intake (m) = 13.6

Intake height (m) = .0

Terrain elevation difference (m) = .0

Output file names

T2R2.out

T2R2.jfd

Minimum Wind Speed (m/s) = .5

Surface roughness length (m) = .20

Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 2 Reactor Release

Initial value of sigma y = 3.48  
Initial value of sigma z = 4.30

Expanded output for code testing not selected

Total number of hours of data processed = 26304  
Hours of missing data = 176  
Hours direction in window = 6069  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 294  
Hours direction not in window or calm = 19765

## 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    | 6363.    | 8112.    | 10401.   | 13186.   | 15034.   | 18304.   | 23835.   | 25121.   | 25202.   | 25564.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       |
| ZERO        | 19765.   | 17995.   | 15664.   | 12798.   | 10933.   | 7503.    | 1837.    | 848.     | 443.     | 83.      |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 24.35    | 31.07    | 39.90    | 50.75    | 57.90    | 70.93    | 92.84    | 96.73    | 98.27    | 99.68    |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 5.76E-03 | 5.30E-03 | 4.63E-03 | 4.22E-03 | 3.52E-03 | 2.75E-03 | 1.94E-03 | 1.71E-03 | 1.44E-03 | 1.24E-03 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

|               |          |
|---------------|----------|
| 0 to 2 hours  | 5.76E-03 |
| 2 to 8 hours  | 3.71E-03 |
| 8 to 24 hours | 2.02E-03 |
| 1 to 4 days   | 1.67E-03 |
| 4 to 30 days  | 1.13E-03 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 6.42E-03 | 1.18E-03 |
| SECTOR-AVERAGE | 4.02E-03 | 7.38E-04 |

NORMAL PROGRAM COMPLETION



## TSC X/Q Estimates for Unit 2 Hatch Door Release

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: jy11@nrc.gov  
J. J. Hayes Phone: (301) 415 3167  
e-mail: jjh@nrc.gov  
L. A. Brown Phone: (301) 415 1232  
e-mail: lab2@nrc.govCode 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 6/5/2003 at 12:41:03

\*\*\*\*\* ARCON INPUT \*\*\*\*\*

Number of Meteorological Data Files = 3  
Meteorological Data File Names  
Farley00.met  
Farley01.met  
Farley02.metHeight of lower wind instrument (m) = 10.0  
Height of upper wind instrument (m) = 61.0  
Wind speeds entered as meters/secondGround-level release  
Release height (m) = 4.2  
Building Area (m<sup>2</sup>) = 1253.0  
Effluent vertical velocity (m/s) = .00  
Vent or stack flow (m<sup>3</sup>/s) = .00  
Vent or stack radius (m) = .00Direction .. intake to source (deg) = 066  
Wind direction sector width (deg) = 90  
Wind direction window (deg) = 021 - 111  
Distance to intake (m) = 54.1  
Intake height (m) = .0  
Terrain elevation difference (m) = .0Output file names  
T2H2.out  
T2H2.jfdMinimum Wind Speed (m/s) = .5  
Surface roughness length (m) = .20  
Sector averaging constant = 4.0

## TSC X/Q Estimates for Unit 2 Hatch Door Release

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 = 26304  
Hours of missing data = 176  
Hours direction in window = 6069  
Hours elevated plume w/ dir. in window = 0  
Hours of calm winds = 294  
Hours direction not in window or calm = 19765

## 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    | 6363.    | 8112.    | 10401.   | 13186.   | 15034.   | 18304.   | 23835.   | 25121.   | 25202.   | 25179.   |
| BELOW RANGE | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 0.       | 385.     |
| ZERO        | 19765.   | 17995.   | 15664.   | 12798.   | 10933.   | 7503.    | 1837.    | 848.     | 443.     | 83.      |
| TOTAL X/Qs  | 26128.   | 26107.   | 26065.   | 25984.   | 25967.   | 25807.   | 25672.   | 25969.   | 25645.   | 25647.   |
| % NON ZERO  | 24.35    | 31.07    | 39.90    | 50.75    | 57.90    | 70.93    | 92.84    | 96.73    | 98.27    | 99.68    |

## 95th PERCENTILE X/Q VALUES

|          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1.81E-03 | 1.75E-03 | 1.60E-03 | 1.48E-03 | 1.24E-03 | 9.57E-04 | 6.52E-04 | 5.59E-04 | 4.90E-04 | 4.11E-04 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|

## 95% X/Q for standard averaging intervals

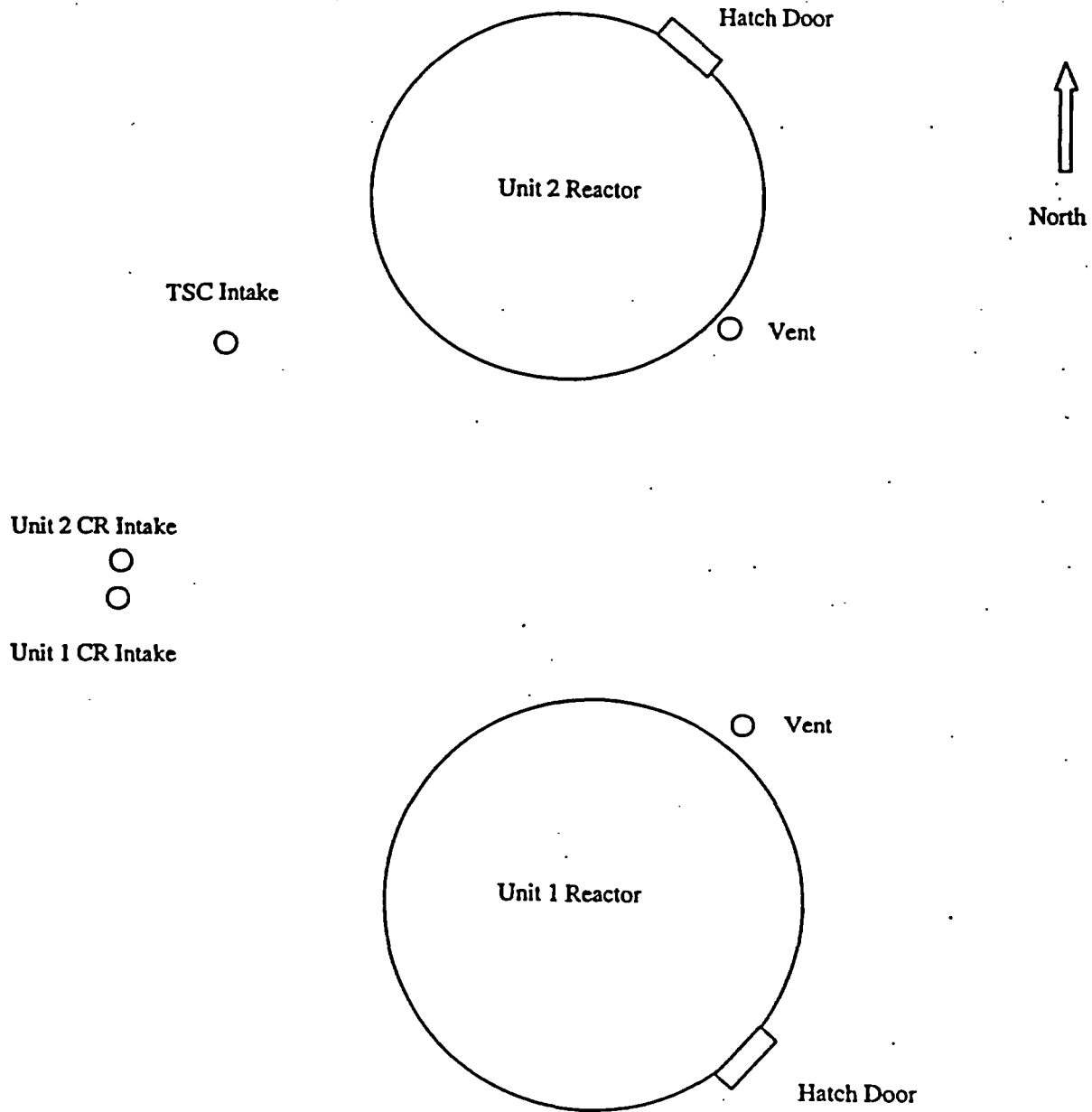
|               |          |
|---------------|----------|
| 0 to 2 hours  | 1.81E-03 |
| 2 to 8 hours  | 1.36E-03 |
| 8 to 24 hours | 6.97E-04 |
| 1 to 4 days   | 5.50E-04 |
| 4 to 30 days  | 3.74E-04 |

## HOURLY VALUE RANGE

|                | MAX X/Q  | MIN X/Q  |
|----------------|----------|----------|
| CENTERLINE     | 2.72E-03 | 3.99E-04 |
| SECTOR-AVERAGE | 1.71E-03 | 2.50E-04 |

NORMAL PROGRAM COMPLETION

**Enclosure 2**  
**Figure 1**  
**Air Intake Locations and Release Points**



**Note:** Release point from the reactor was a point on the containment surface closest to the receptor location.

**Enclosure 2**  
**Table 1**  
**Plant Data for Air Intake Locations and Release Points**

Drawings used to obtain plant data are listed in the following table.

| Description                           | Drawing Number  |
|---------------------------------------|---|
| CR Air Intake Locations               | D-175110, Sheet 1, Rev. 33                                |
| Reactor Vent and Hatch Door Locations | D-176006, Rev. 32 (Unit 1) and D-206006, Rev. 36 (Unit 2) |
| Hatch Door Elevations                 | D-176120, Rev. 3 (Unit 1) and D-206120, Rev. 2 (Unit 2)   |
| TSC Air Intake Location               | D-205574, Rev. 6  |

Distances between the release points and air intakes are presented below.

| Receptor             | Release Point | Horizontal Distance (ft) | Vertical Distance (ft) | Straight-Line Distance |      | Direction to Source (degree) |
|----------------------|---------------|--------------------------|------------------------|------------------------|------|------------------------------|
| Unit 1 CR Air Intake | Unit 1        |                          |                        | ft                     | m    |                              |
|                      | Vent          | 200.6                    | 108                    | 227.8                  | 69.4 | 115                          |
|                      | Reactor       | 128.5                    | 0                      | 128.5                  | 39.2 | 136                          |
|                      | Hatch Door    | 263.7                    | -28.75                 | 265.3                  | 80.9 | 136                          |
| Unit 1 CR Air Intake | Unit 2        |                          |                        |                        |      |                              |
|                      | Vent          | 199.8                    | 108                    | 227.1                  | 69.2 | 66                           |
|                      | Reactor       | 128.5                    | 0                      | 128.5                  | 39.2 | 42                           |
|                      | Hatchdoor     | 269.2                    | -28.75                 | 270.7                  | 82.5 | 43                           |

| Receptor             | Release Point | Horizontal Distance (ft) | Vertical Distance (ft) | Straight-Line Distance |      | Direction to Source (degree) |
|----------------------|---------------|--------------------------|------------------------|------------------------|------|------------------------------|
| Unit 2 CR Air Intake | Unit 1        |                          |                        | ft                     | m    |                              |
|                      | Vent          | 203.3                    | 108                    | 230.2                  | 70.2 | 116                          |
|                      | Reactor       | 132.3                    | 0                      | 132.3                  | 40.3 | 138                          |
|                      | Hatch Door    | 269.5                    | -28.75                 | 271.0                  | 82.6 | 137                          |
| Unit 2 CR Air Intake | Unit 2        |                          |                        |                        |      |                              |
|                      | Vent          | 202.4                    | 108                    | 229.4                  | 69.9 | 67                           |
|                      | Reactor       | 132.9                    | 0                      | 132.9                  | 40.5 | 45                           |
|                      | Hatch door    | 264.8                    | -28.75                 | 266.4                  | 81.2 | 45                           |

| Receptor       | Release Point | Horizontal Distance (ft) | Vertical Distance (ft) | Straight-Line Distance |       | Direction to Source (degree) |
|----------------|---------------|--------------------------|------------------------|------------------------|-------|------------------------------|
| TSC Air Intake | Unit 1        |                          |                        | ft                     | m     |                              |
|                | Vent          | 230.3                    | 123                    | 261.1                  | 79.6  | 141                          |
|                | Reactor       | 189.1                    | 0                      | 189.1                  | 57.6  | 157                          |
|                | Hatch Door    | 330.4                    | -13.75                 | 330.7                  | 100.8 | 157                          |
| TSC Air Intake | Unit 2        |                          |                        |                        |       |                              |
|                | Vent          | 153.5                    | 123                    | 196.7                  | 60.0  | 96                           |
|                | Reactor       | 44.5                     | 0                      | 44.5                   | 13.6  | 66                           |
|                | Hatch door    | 176.9                    | -13.75                 | 177.4                  | 54.1  | 66                           |

**Joseph M. Farley Nuclear Plant Units 1 and 2  
Response to Request for Additional Information Related to  
Request to Revise Technical Specifications – Containment Equipment Hatch**

**Enclosure 3**

**CD Containing Meteorological Data Files**