J. Barnie Beasley, Jr., P.E.
Vice President

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7110
Fax 205.992.0341

SOUTHERN COMPANY
Energy to Serve Your World℠

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.*

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:

Delta T	Stability Class
< -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:

Release/Intake	Elevation (ft) Above Sea Level
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)

ENCLOSURE 2

ACRON96 Output (36 sheets)

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: jyl1@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^2)                  =       .0
  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)  =      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
    C1V1.out
    C1V1.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 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: jyl1@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^2)                  =   887.0
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)  =     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
  C1R1.out
  C1R1.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

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.	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

1.61E-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: jyl1@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^2)                  =   1253.0
     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)  =     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
       C1H1.out
       C1H1.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 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 = 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: jyl1@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 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^2)                  =       .0
   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)  =      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
     C1V2.out
     C1V2.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 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 = 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
e-mail: jyl1@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 12:39:23

```
******* 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^2)                  =    887.0
   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)  =      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
```

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	8249.	10522.	13181.	16054.	17851.	20621.	24375.	25200.	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
```

	1.81E-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
e-mail: jyl1@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 12:39:35

```
******* 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^2)                  =   1253.0
   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)  =      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
     C1H2.out
     C1H2.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
e-mail: jyl1@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 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^2)                  =       .0
   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)  =      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: jyl1@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  12:40:00

 ******* 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^2)                  =    887.0
    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)  =      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)     =       .0

    Output file names
      C2R1.out
      C2R1.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 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: jyl1@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 12:39:45

******* 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^2)                  =   1253.0
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)  =      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

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	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: jyl1@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 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^2)                  =       .0
   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)  =      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

1.11E-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: jyl1@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 12:40:12

```
******* 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^2)                  =    887.0
   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)  =      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)     =       .0

   Output file names
     C2R2.out
     C2R2.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 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 = 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-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	1.24E-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: jyl1@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 12:40:21

```
******* 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^2)                  =   1253.0
   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)  =      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)     =       .0

   Output file names
     C2M2.out
     C2M2.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 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 = 7498
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: jyl1@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 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^2)                  =       .0
   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)  =      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

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	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: jyl1@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 12:40:44

```
******* 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^2)                  =   1078.0
   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)  =      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)     =       .0

   Output file names
     T2R1.out
     T2R1.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 = 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 = 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-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

	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
e-mail: jyl1@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 12:40:31

```
******* 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)                   =     -4.2
   Building Area (m^2)                  =   1253.0
   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)  =      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)     =       .0

   Output file names
     T2M1.out
     T2M1.jfd

   Minimum 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
e-mail: jyl1@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 13:40:03

```
******* 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^2)                  =       .0
   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)               =     60.0
   Intake height  (m)                   =       .0
   Terrain elevation difference (m)     =       .0

   Output file names
     T2V2.out
     T2V2.jfd

   Minimum 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
e-mail: jyl1@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 12:40:54

```
******* 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^2)                  =   1078.0
   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)  =      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: jyl1@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 12:41:03

```
******* 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)                   =      4.2
   Building Area (m^2)                  =   1253.0
   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)  =      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)     =       .0

   Output file names
     T2H2.out
     T2H2.jfd

   Minimum 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

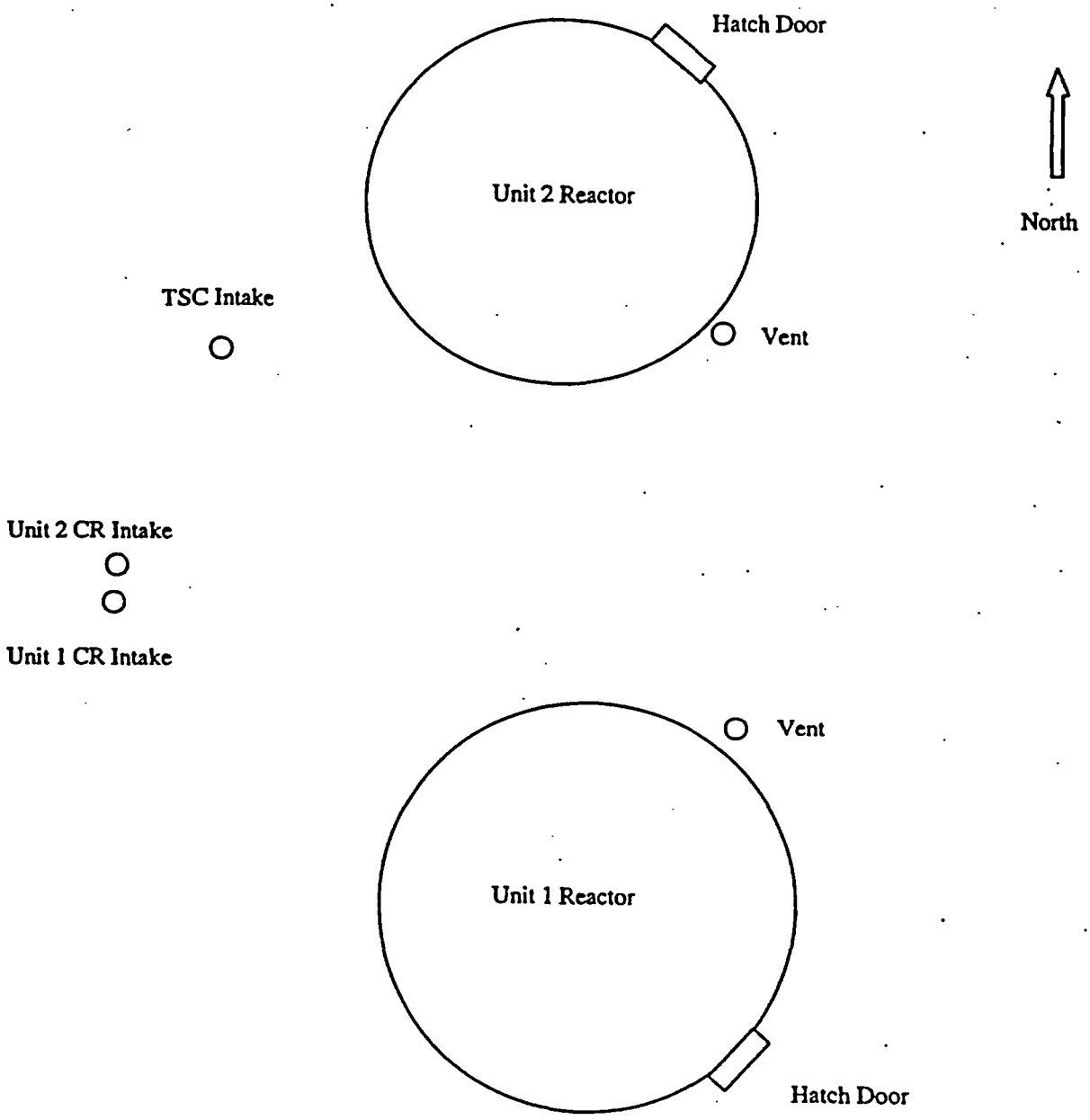
0 to 2 hours	1.81E-03
2 to 8 hours	1.36E-03
8 to 24 hours	6.97E-04
1 to 4 days	5.50E-04
4 to 30 days	3.74E-04

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 obtained 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)
				ft	m	
Unit 1 CR Air Intake	**Unit 1**					
	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)
				ft	m	
Unit 2 CR Air Intake	**Unit 1**					
	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)
				ft	m	
TSC Air Intake	**Unit 1**					
	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