Attachment 3

AmerGen/Exelon Calculation C-1302-822-E310-081, Revision 0,
"Oyster Creek Onsite Atmospheric Dispersion (X/Q) for Fuel Handling Accident (FHA)"

Design Analysis Major Revision Cover Sheet

Design Analysis (Major Revision)		**Last Page No.** [6] 25 / Att. J1	
Analysis No.: [1]	C-1302-822-E310-081	**Revision:** [2]	0
Title: [3]	Oyster Creek Onsite Atmospheric Dispersion (X/Q) for Fuel Handling Accident (FHA)		
EC/ECR No.: [4]	OC 07-00790	**Revision:** [5]	0
Station(s): [7]	Oyster Creek	**Component(s):** [14]	
Unit No.: [8]	1	N/A	
Discipline: [9]	Mech		
Descrip. Code/Keyword: [16]	SR, AST, DBA, Dose, X/Q, Dispersion		
Safety/QA Class: [11]	SR		
System Code: [12]	VC, VE, VG,VS		
Structure: [13]	Z		

CONTROLLED DOCUMENT REFERENCES [15]

Document No.:	From/To	Document No.:	From/To
Drawing 3E-153-02-002, Rev. 10	From		
Drawing 3E-153-32-001, Rev. 0	From		
Drawing 3E-153-02-007, Rev. 4	From		

Is this Design Analysis Safeguards Information? [18] Yes ☐ No ☒ If yes, see SY-AA-101-106

Does this Design Analysis contain Unverified Assumptions? [17] Yes ☐ No ☒ If yes, ATI/AR#: _____

This Design Analysis SUPERCEDES: [19] None

Description of Revision (list affected pages for partials): [19] Initial Issue

Preparer: [20] Traci Thomas (Print Name) — Sign Name — 10/5/07 (Date)

Method of Review: [21] **Detailed Review** ☒ **Alternate Calculations (attached)** ☐ **Testing** ☐

Reviewer: [22] Jack Robinson (Print Name) — Sign Name — 10/5/07 (Date)

Review Notes: [23] Independent review ☒ Peer review ☐ All inputs, assumptions, approaches, numerical analyses, and results were independently reviewed and checked.

(For External Analyses Only)

External Approver: [24] F. Miscicer (Print Name) — Sign Name — 10/5/07 (Date)

Exelon Reviewer: [25] T.J. Mscisz (Print Name) — Sign Name — 10/5/07 (Date)

Independent 3rd Party Review Reqd? [26] Yes ☐ No ☒

Exelon Approver: [27] Steven P. Hutchins (Print Name) — Sign Name — 10/5/07 (Date)

1.1 OWNER'S ACCEPTANCE REVIEW CHECKLIST FOR EXTERNAL DESIGN ANALYSIS

DESIGN ANALYSIS NO. C-1302-822-E310-081, Rev. 0

		Yes	No	N/A
1.	Do assumptions have sufficient rationale?	☑	☐	☐
2.	Are assumptions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
3.	Do the design inputs have sufficient rationale?	☑	☐	☐
4.	Are design inputs correct and reasonable?	☑	☐	☐
5.	Are design inputs compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
6.	Are Engineering Judgments clearly documented and justified?	☑	☐	☐
7.	Are Engineering Judgments compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
8.	Do the results and conclusions satisfy the purpose and objective of the Design Analysis?	☑	☐	☐
9.	Are the results and conclusions compatible with the way the plant is operated and with the licensing basis?	☑	☐	☐
10.	Does the Design Analysis include the applicable design basis documentation?	☑	☐	☐
11.	Have any limitations on the use of the results been identified and transmitted to the appropriate organizations?	☑	☐	☐
12.	Are there any unverified assumptions?	☐	☑	☐
13.	Do all unverified assumptions have a tracking and closure mechanism in place?	☐	☐	☑
14.	Have all affected design analyses been documented on the Affected Documents List (ADL) for the associated Configuration Change?	☑	☐	☐
15.	Do the sources of inputs **and** analysis methodology used meet current technical requirements and regulatory commitments? (If the input sources **or** analysis methodology are based on an out-of-date methodology or code, additional reconciliation may be required if the site has since committed to a more recent code)	☑	☐	☐
16.	Have vendor supporting technical documents and references (including GE DRFs) been reviewed when necessary?	☑	☐	☐

EXELON REVIEWER: T.J. Mscisz [signature] **DATE:** 10/5/07

Print / Sign

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1.0 PURPOSE

This calculation, C-1302-822-E310-081, Rev. 0, presents new atmospheric relative concentration (X/Q) values for Fuel Handling Accident evaluations for the Oyster Creek Generating Station. The purpose of this calculation is to determine the Control Room HVAC Intakes A and B relative concentration values (X/Q, in sec/m^3) resulting from certain postulated accidental radiological release locations. The values resulting from this calculation can be used as input for the determination of radiological doses using the Alternative Source Terms (AST) per Regulatory Guide (RG) 1.183 (Reference 1).

The X/Q values resulting at Intakes A and B are calculated using the NRC-sponsored computer code ARCON96 (Reference 2) consistent with the guidance in RG 1.194 (Reference 3).

2.0 ARCON96 ANALYSIS

2.1 Identification of Computer Programs/Method of Analysis

ARCON96 is a commercial software package designated by Washington Group International as NU-830, an "active" program applicable to nuclear safety related analyses as well as non-safety related studies and evaluations. Its use is principally control room habitability assessments. The NU-830 code has been verified for 0-2 hour, 2-8 hour, and 8-24 hour centerline and sector X/Q averages and the 95% maximum X/Q. This verification is in accordance with Revision 4 of the Washington Group International Nuclear Engineering Standard for Computer Software Control, NEP-09. Revision 0 of NU-830 was verified for ground-level and zero exit velocity uncapped vents, and Revision 1 was verified for zero exit velocity stack releases.

<u>ARCON96 Program Description</u> [excerpted from NUREG/CR-6331 Rev. 1 (Reference 2)]

ARCON96 is a straight line Gaussian dispersion model used in control room habitability assessments for estimating dispersion in the vicinity of buildings to calculate relative concentrations at control room air intakes that would be exceeded no more than five percent of the time. The basic diffusion model implemented in the ARCON96 code is a straight-line Gaussian model that assumes the release rate is constant for the entire period of release. This assumption is made to permit evaluation of potential effects of accidental releases without having to specify a complete release sequence. Ambient atmospheric conditions measured in accordance with RG 1.23 (Reference 4) are input to ARCON96 by way of a sequential hour-by-hour meteorological database of jointly measured wind speed, wind direction, and Pasquill stability class, as derived from the vertical temperature difference recorded at representative elevations (i.e., tower levels).

ARCON96 permits evaluation of ground-level, vent, and elevated releases. Building wake effects are considered in the evaluation of relative concentrations from ground-level and vent releases as a function of the ratio between the effluent vertical velocity and the release-height wind speed, using the same procedure used in the NRC XOQDOQ code (Reference 5).

Diffusion coefficients used in ARCON96 have three components. The first component is the diffusion coefficient used in other NRC models, for example XOQDOQ, and PAVAN. The other two components are corrections to account for enhanced dispersion under low wind speed conditions and in building wakes. Derivations of the low wind speed and building wake corrections are described by Ramsdell and Fosmire (Reference 6). Parameter values for the correction factors are based on analysis of diffusion data collected in various building wake diffusion experiments (Reference 6). The experiments were conducted under a wide range of meteorological conditions. However, a large number of experiments were conducted during low wind speeds, when wake effects are minimal. The wake correction model included in ARCON96 treats diffusion under these conditions much better than previous models. Thus, the diffusion coefficients in ARCON96 account for both low-wind speed meander and wake effects.

ARCON96 calculates relative concentrations using hourly meteorological data. It then combines the hourly averages to estimate concentrations for periods ranging in duration from 2 hours to 30 days. Wind direction is considered as the averages are formed. As a result, the averages account for persistence in both diffusion conditions and wind direction. Cumulative frequency distributions are prepared from the average relative concentrations. Relative concentrations that are exceeded no more than five percent of the time (95th percentile relative concentrations) are determined from the cumulative frequency distributions for each averaging period. Finally, the relative concentrations for five standard averaging periods used in control room habitability assessments are calculated from the 95th percentile relative concentrations.

2.2 Assumptions

The following assumptions have been made relative to specific release point locations:

- The Reactor Building (RB) East Airlock Door release height is assumed to be at the vertical center of an 8 ft high doorway.
- Consistent with the application of the "taut string method" described in RG 1.194 (Reference 1) and amplified by Mr. Steve LaVie of NRC (Reference 2), the intake height is set equal to the release height for the X/Q evaluations of point sources.
- The Drywell (D/W) Access Facility, and Monitor and Control (MAC) Facility Entrance release heights are assumed to be at the vertical center of the doorways (doorway measurements specified in Reference 8, provided in Attachment A).
- The MAC Facility Personnel Airlock release is assumed to be at the vertical center of the tornado/missile shield.

2.3 Inputs

2.3.1 Meteorological Data

The Oyster Creek onsite meteorological tower database for the five-year period, 1995-1999, as supplied by Exelon (Reference 9), was applied in the ARCON96 modeling analysis. Wind measurements were taken at 33 ft and 150 ft, and the vertical temperature difference was

measured between 150 ft and 33 ft. The minimum wind speed (i.e. wind threshold) was set to the ARCON96 default value of 0.5 meters per second per RG 1.194, Table A-2.

Attachment B includes the five-year wind rose diagrams based on the lower and upper level data in the meteorological database.

Attachment C contains the lower and upper level joint wind direction, wind speed, and stability class distribution tables, based on the five-year lower and upper level meteorological database. (These data are provided both in the format of number of observations and percent occurrence frequency).

Note: This meteorological tower data is the same that was utilized for AST LOCA, which was previously submitted and approved by NRC for TS Amendment #262 dated April 26, 2007.

2.3.2 Source/Intake Scenarios and Configurations

Table 1 below outlines each of 15 potential release locations. Of these, the following nine (9) (indicated with a "yes" in the table) were selected for ARCON96 modeling.

- RB Roof Hatch
- Stack Tunnel Door
- D/W Access Facility (door on west wall and western-most door on south wall)
- East Airlock Door
- RB Diffuse Release
- Commodities Penetrations on the South RB Wall
- Commodities Penetration on the North RB Wall
- MAC Facility Personnel Airlock
- MAC Facility Entrance

Table 1 also provides the justification for each of the release points not selected for modeling. Specifically, for each such point, Table 1 identifies the nearest modeled release point that is at approximately the same elevation, and that is also a shorter taut string distance from both Intakes A and B.

TABLE 1
Potential Release Points For Oyster Creek Fuel Handling Accident

Item	Description	Comments	X/Q Modeling Required?
1	RB Roof hatch NOTE: This hatch has an airlock associated with it so roof access is possible during plant operation.	It is feasible that the airlock could be defeated during an outage if significant roof maintenance is required.	YES
2	Ventilation ductwork below siding structure on west side of RB (north end of west wall): This is permanently installed ductwork from the refueling floor area.	It is not expected that these penetrations will be opened during fuel movement.	NO Must prevent from being opened during fuel movement.
3	Ventilation ductwork below siding structure on west side of RB (south end of west wall): This is permanently installed ductwork from the refueling floor area.	It is not expected that these penetrations will be opened during fuel movement.	NO Must prevent from being opened during fuel movement.
4	RB grade-level access at south east corner of RB: This access is a security barrier and will not normally be opened.	It is possible that this access point could be open with appropriate security measures in place during an outage with fuel movement.	NO X/Q bounded by RB commodities penetration on south RB wall (Item 10)[1]
5	Main stack exhaust fans and ductwork (base of main stack)	This ductwork could be dismantled during an outage with fuel movement in progress. This work is the reason for this evaluation.	YES
6	RB entrance (D/W Access Facility) There is an airlock associated with this access point.	If the airlock is defeated, the actual point of release could be at the entrance to the D/W Access Facility (northeast of RB), which is closer to the CR intake.	YES[2]
6A	RB personnel access airlock on east wall of 23' 6" elevation RB wall (near columns RA and R5).	It may be beneficial if the airlock could be defeated during an outage with fuel movement. The actual point of release is directly in front of the airlock.	YES
7	RB Truck Airlock (at column RA, between columns R2 and R3):	This airlock could be open during an outage with fuel movement.	NO X/Q bounded by RB commodities penetration on south RB wall (Item 10) and/or RB personnel airlock on east wall (Item 6A)[1]
8	Isolation Condenser (IC) exhaust (east wall of RB) This release point is a release point for a LOCA.	It is not expected that the IC would be opened during an outage.	NO Specific analysis necessary if IC required to be opened during fuel handling.
9	RB diffuse release	This area source is from exposed RB walls "visible" to the CR intakes.	YES

10	RB commodities penetration on south RB wall[3] (23.5' elev.)	This is a flanged connection through which, air, electric, and water connections are run. Existing procedures allow for use.	YES
11	RB commodities penetration on north RB wall (23.5' elev.)	This is a flanged connection through which, air, electric, and water connections are run. Existing procedures allow for use.	YES
12	MAC Facility Personnel Airlock (exits out of tornado/missile protection area located on the north RB wall (23.5' elev.)		YES
13	MAC Facility Entrance (double doors)		YES
13A	MAC Facility Entrance (single door)		NO X/Q bounded by the MAC Facility Personnel Airlock (Item 12)[1]

[1] Bounding modeled release point most proximate to subject release point.
[2] There are four (4) doors associated with the D/W Access Facility (Item 6). The X/Q for the door on the northern wall would be bounded by that calculated for the door on the west wall which is closer to Intakes A and B. Similarly, on the southern wall, the X/Q for the eastern-most door would be bounded by the western-most door, which is closer to Intakes A and B.
[3] There are two commodities penetrations located on the south RB wall (Item 10). The taut string length was calculated from each penetration to both Intakes A and B, and the penetration of shortest length to Intake A and to Intake B was selected to be modeled.

Each of the nine (9) Oyster Creek release points has two (2) associated receptors, Intake A, with a vertical center height above grade level of 13.7 m, and Intake B, with a vertical center height of 18.1 m (Reference 10, provided in Attachment D).

All scenarios are modeled as point sources in ARCON96, except the Reactor Building Wall scenarios which are modeled as a "diffuse area" source.

All point source scenarios are conservatively assumed to have vertical velocity, exhaust flow and stack/vent radius values equal to zero (0).

Point Sources

ARCON96 requires an input of horizontal source-receptor distance, which is defined in RG 1.194 Section 3.4 as "the shortest horizontal distance between the release point and the intake". However, for releases in building complexes, a "taut string length" can be utilized as justifiable. For each applicable point source, the "taut string length" distances to Intakes A and B were utilized to account for the intervening Reactor Building (calculations shown in Attachment E). According to a Washington Group International phone conversation with Mr. Steve LaVie of NRC on May 17, 2004, when the "taut string length" is utilized, the intake and release height should be set equal to each other so as not to also take undue advantage of the slant distance that ARCON96 calculates (Reference 7). Therefore, for each of the scenarios, the intake height was set equal to the release height.

The height of each of the release points are all less than 2.5 times the height of their adjacent buildings; and therefore, per Regulatory Guide 1.194 they are modeled as ground-level releases. Aerodynamic building plume downwash effects are present for ground-level releases; therefore, in accordance with RG 1.194, Table A-2, the building cross-sectional area perpendicular to the wind direction is utilized. Attachment F contains calculations of the projected area of the Reactor Building for each of the point sources and, where applicable, calculations of the "redirected" intake-to-source direction (calculated in Attachment E) and the associated projected area of the Reactor Building. The redirected projected area is derived based on an intake-to-source direction that is adjusted to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.

Diffuse Area Source (i.e. Reactor Building Wall)

Per RG 1.194, Section 3.2.4.5, the diffuse area source representation in ARCON96 requires the building cross-sectional area to be calculated from the maximum building dimensions projected onto a vertical plane perpendicular to the line of sight from the building center to the intake.

RG 1.194, Figure 2 specifies that, for a diffuse area source, "only that part of the structure above grade or an enclosing building should be included in the building height. " For the Reactor Building Wall scenarios, the portion of the Reactor Building above the Office Building roof height was utilized for determining the release height, building area and vertical diffusion coefficient (σ_z). However, since the Office Building only borders one side of the Reactor Building, a set of

"alternate" values for these parameters based on the entire height of the Reactor Building were also derived.

RG 1.194 also requires the diffuse area source release height to be assumed at the vertical center of the projected area, and initial lateral (σ_y) and vertical (σ_z) diffusion coefficients to be specified.

Attachment G contains the diffuse area source calculations for the Reactor Building Wall.

A summary of ARCON96 input parameters is shown for each source/intake scenario below in Table 2.

TABLE 2
ARCON96 Input Summary

PARAMETER	VALUE	REFERENCE	NOTES
ITEM 1			
Reactor Building Roof Hatch to Intake A			
Horizontal Distance	192.4 ft = 58.6 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	121°	Calculated in Attachment H	From true north
Release Height	146 ft = 44.5 m	Reference 10 (provided in Attachment D)	169 ft - 23 ft grade
Intake Height	146 ft = 44.5 m	Reference 10 (provided in Attachment D) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2323 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utilized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS1.inp		Reactor Building Roof Hatch to Intake A
Reactor Building Roof Hatch to Intake B			
Horizontal Distance	172.2 ft = 52.5 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	110°	Calculated in Attachment H	From true north
Release Height	146 ft = 44.5 m	Reference 10 (provided in Attachment D)	169 ft - 23 ft grade
Intake Height	146 ft = 44.5 m	Reference 10 (provided in Attachment D) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2341 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utilized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS2.inp		Reactor Building Roof Hatch to Intake B

ITEM 5			
Stack Tunnel Door to Intake A			
Horizontal Distance	265.3 ft = 80.9 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	102°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	144°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	0 m	Reference 10 (provided in Attachment D)	
Intake Height	0 m	Reference 10 (provided in Attachment D) and Reference 7	1) *Intake height set equal to the release height per phone conversation* with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2303 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utilized per RG 1.194, Table A-2.
Redirected Building Area	2032 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utilized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS3.inp		Stack Tunnel Door to Intake A
	OYS4.inp		Stack Tunnel Door to Intake A utilizing redirected direction from intake to source
Stack Tunnel Door to Intake B			
Horizontal Distance	253.7 ft = 77.3 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	95°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	130°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	0 m	Reference 10 (provided in Attachment D)	
Intake Height	0 m	Reference 10 (provided in Attachment D) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2231 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utilized per RG 1.194, Table A-2.
Redirected Building Area	2244 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utilized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS5.inp		Stack Tunnel Door to Intake B
	OYS6.inp		Stack Tunnel Door to Intake B utilizing redirected direction from intake to source

ITEM 6			
D/W Access Facility (West Door) to Intake A			
Horizontal Distance	190.2 ft = 58 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	17°	Calculated in Attachment H	From true north
Release Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A)	Assumed middle of the 7 ft doorway
Intake Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2191 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utilized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS15.inp		D/W Access Facility (West Door) to Intake A
D/W Access Facility (South Door) to Intake A			
Horizontal Distance	170.3 ft = 51.9 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	30°	Calculated in Attachment H	From true north
Release Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A)	Assumed middle of the 7 ft doorway
Intake Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2324 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS16.inp		D/W Access Facility (South Door) to Intake A

D/W Access Facility (West Door) to Intake B			
Horizontal Distance	219.9 ft = 67.0 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	17°	Calculated in Attachment H	From true north
Release Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A)	Assumed middle of the 7 ft doorway
Intake Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2191 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS17.inp		D/W Access Facility (West Door) to Intake B

D/W Access Facility (South Door) to Intake B			
Horizontal Distance	199.1 ft = 60.7 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	28°	Calculated in Attachment H	From true north
Release Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A)	Assumed middle of the 7 ft doorway
Intake Height	3.5 ft = 1.1 m	Reference 8 (provided in Attachment A) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2311 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS18.inp		D/W Access Facility (South Door) to Intake B

ITEM 6A			
East Airlock Door to Intake A			
Horizontal Distance	201.8 ft = 61.5 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	74°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	31°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	4 ft = 1.2 m	Reference 10 (provided in Attachment D)	Assumed middle of an 8 ft doorway
Intake Height	4 ft = 1.2 m	Reference 10 (provided in Attachment D) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	1875 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2334 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS7.inp		East Airlock Door to Intake A
	OYS8.inp		East Airlock Door to Intake A utiilzing redirected direction from intake to source
East Airlock Door to Intake B			
Horizontal Distance	230.7 ft = 70.3 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	66°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	26°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	4 ft = 1.2 m	Reference 10 (provided in Attachment D)	Assumed middle of an 8 ft doorway
Intake Height	4 ft = 1.2 m	Reference 10 (provided in Attachment D) and Reference 7	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2071 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2303m^2	Calculated in Attachment F	Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS9.inp		East Airlock Door to Intake B
	OYS10.inp		East Airlock Door to Intake B utiilzing redirected direction from intake to source

ITEM 9			
Reactor Building Wall to Intake A (Diffuse Area)			
Horizontal Distance	25.8 ft = 7.9 m	Calculated in Attachment G	From the center of the projected plane perpendicular to the line of sight from the building center to Intake A
Direction from Intake to Source	93°	Calculated in Attachment H	From true north
Release Height	92 ft = 28 m	Calculated in Attachment G	Center of the projected plane above the Office Building
Alternate Release Height	73 ft = 22.3 m	Calculated in Attachment G	Center of the Reactor Building; to be utilized with alternate sigma z
Intake Height	45 ft	Reference 10 (provided in Attachment D)	Center of Intake; (68 ft – 23 ft grade)
Building Area	1632 m^2	Calculated in Attachment G	Projected area of the Reactor Building above the Office Building perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Alternate Building Area	2205 m^2	Calculated in Attachment G	Projected area of the entire Reactor Building perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Sigma y	8.3 m	Calculated in Attachment G	Calculated based on the projected width
Sigma z	5.5 m	Calculated in Attachment G	Calculated based on the Reactor Buidling height above the Office Building
Alternate Sigma z	7.4 m	Calculated in Attachment G	Calculated based on the height of the entire Reactor Building; to be utilized with alternate release height
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS11.inp		Reactor Building Wall to Intake A
	OYS12.inp		Reactor Building Wall to Intake A utilizing alternate release height, alternate building area and alternate sigma z
Reactor Building Wall to Intake B (Diffuse Area)			
Horizontal Distance	49.4 ft = 15.1 m	Calculated in Attachment G	From the center of the projected plane perpendicular to the line of sight from the building center to Intake B
Direction from Intake to Source	79°	Calculated in Attachment H	From true north
Release Height	92 ft = 28 m	Calculated in Attachment G	Center of the projected plane above the Office Building
Alternate Release Height	73 ft = 22.3 m	Calculated in Attachment G	Center of the Reactor Building; to be utilized with alternate sigma z
Intake Height	59.5 ft	Reference 10 (provided in Attachment D)	Center of Intake; (bottom (79)+((top (86) – bottom(79))/2)-23 ft grade)
Building Area	1456 m^2	Calculated in Attachment G	Projected area of the Reactor Building above the Office Building perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Alternate Building Area	1968 m^2	Calculated in Attachment G	Projected area of the entire Reactor Building perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Sigma y	7.4 m	Calculated in Attachment G	Calculated based on the projected width
Sigma z	5.5 m	Calculated in Attachment G	Calculated based on the Reactor Buidling height above the Office Building
Alternate Sigma z	7.4 m	Calculated in Attachment G	Calculated based on the height of the entire Reactor Building; to be utilized with alternate release height
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS13.inp		Reactor Building Wall to Intake B
	OYS14.inp		Reactor Building Wall to Intake B utilizing alternate release height, alternate building area and alternate sigma z

ITEM 10			
Commodities Penetration on the Reactor Building South Wall to Intake A			
Horizontal Distance	181.3 ft = 55.3 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	118°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	144°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	6.5 ft = 2.0 m	Reference 11	
Intake Height	6.5 ft = 2.0 m	Reference 7 and Reference 11	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2337 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2032 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS19.inp		Commodities Penetration on the Reactor Building South Wall to Intake A
	OYS20.inp		Commodities Penetration on the Reactor Building South Wall to Intake A utiilzing redirected direction from intake to source
Commodities Penetration on the Reactor Building South Wall to Intake B			
Horizontal Distance	169.7 ft = 51.7 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	107°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	130°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	6.5 ft = 2.0 m	Reference 11	
Intake Height	6.5 ft = 2.0 m	Reference 7 and Reference 11	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2334 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2244 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS21.inp		Commodities Penetration on the Reactor Building South Wall to Intake B
	OYS22.inp		Commodities Penetration on the Reactor Building South Wall to Intake B utiilzing redirected direction from intake to source

ITEM 11			
Commodities Penetration on the Reactor Building North Wall to Intake A			
Horizontal Distance	101.3 ft = 30.9 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	47°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	31°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	3.75 ft = 1.14 m	Reference 11	
Intake Height	3.75 ft = 1.14 m	Reference 7 and Reference 11	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2318 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2334 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS23.inp		Commodities Penetration on the Reactor Building North Wall to Intake A
	OYS24.inp		Commodities Penetration on the Reactor Building North Wall to Intake A utiilzing redirected direction from intake to source
Commodities Penetration on the Reactor Building North Wall to Intake B			
Horizontal Distance	130.7 ft = 39.7 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	39°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	26°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	3.75 ft = 1.14 m	Reference 11	
Intake Height	3.75 ft = 1.14 m	Reference 7 and Reference 11	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2345 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2303 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS25.inp		Commodities Penetration on the Reactor Building North Wall to Intake B
	OYS26.inp		Commodities Penetration on the Reactor Building North Wall to Intake B utiilzing redirected direction from intake to source

ITEM 12			
MAC Facility Personnel Airlock to Intake A			
Horizontal Distance	88.1 ft = 26.9 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	32°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	31°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	5.5 ft = 1.7 m	Reference 12	Assumed to exit out of the vertical center of the tornado/missile shield
Intake Height	5.5 ft = 1.7 m	Reference 7 and Reference 12	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	2334 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2334 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS27.inp		MAC Facility Personnel Airlock to Intake A
	OYS28.inp		MAC Facility Personnel Airlock to Intake A utiilzing redirected direction from intake to source
MAC Facility Personnel Airlock to Intake B			
Horizontal Distance	117.0 ft = 35.7 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	27°	Calculated in Attachment H	From true north
Redirected Direction from Intake to Source	26°	Calculated in Attachment E	From true north; direction adjusted to account for redirected flow from the nearest taut string building edge to the intake per Reg. Guide 1.194, Table A-2.
Release Height	5.5 ft = 1.7 m	Reference 12	Assumed to exit out of the vertical center of the tornado/missile shield
Intake Height	5.5 ft = 1.7 m	Reference 7 and Reference 12	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	2311 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Redirected Building Area	2303 m^2	Calculated in Attachment F	1) Redirected projected area perpendicular to the redirected direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS29.inp		MAC Facility Personnel Airlock to Intake B
	OYS30.inp		MAC Facility Personnel Airlock to Intake B utiilzing redirected direction from intake to source

ITEM 13			
MAC Facility Entrance to Intake A			
Horizontal Distance	95.8 ft = 29.2 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	348°	Calculated in Attachment H	From true north
Release Height	5.8 ft = 1.8 m	References 8 (provided in Attachment A) and Reference 13	(Height of Doorway/2)+base of MAC door from ground = (6.67 ft / 2)+2.5 ft = 5.8 ft = 1.8 m
Intake Height	5.8 ft = 1.8 m	References 8 (provided in Attachment A) and References 7 and 13	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake = (68 ft – 23 ft grade) = 45 ft = 13.7 m
Building Area	1525 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS31.inp		MAC Facility Entrance to Intake A
MAC Facility Entrance to Intake B			
Horizontal Distance	123.4 ft = 37.6 m	Calculated in Attachment E	Taut String Length was utilized for horizontal distance per RG 1.194, Section 3.4
Direction from Intake to Source	355°	Calculated in Attachment H	From true north
Release Height	5.8 ft = 1.8 m	References 8 (provided in Attachment A) and Reference 13	
Intake Height	5.8 ft = 1.8 m	References 8 (provided in Attachment A) and References 7 and 13	1) Intake height set equal to the release height per phone conversation with Steve LaVie from NRC on May 17, 2004 as pertaining to the application of the taut string method. 2) Actual intake height = Center of Intake; (bottom+((top – bottom)/2))-23 ft grade) = (79+((86-79)/2))-23 = 59.5 ft = 18.1 m
Building Area	1739 m^2	Calculated in Attachment F	Projected area perpendicular to the direction from intake to source was utlized per RG 1.194, Table A-2.
Minimum Wind Speed	0.5 m/s	RG 1.194, Table A-2	
Meteorological Files	OC95LL.met OC96LL.met OC97LL.met OC98LL.met OC99LL.met	Reference 9	
Wind Measurement Levels	33 and 150 ft = 10 and 45.7 m	Reference 9	
Delta T Levels	150 - 33 ft = 45.7 - 10 m	Reference 9	
Input File Names	OYS32.inp		MAC Facility Entrance to Intake B

3.0 RESULTS AND CONCLUSIONS

The X/Q values resulting from the ARCON96 modeling analysis of each source/intake scenario are presented in Table 3 below. The modeling details and computer output for these scenarios are contained in Attachment I and the corresponding WGI Computer Disclosure Sheet is contained in Attachment J.

TABLE 3
ARCON96 X/Q Summary

Source	Receptor	X/Q (sec/m³)					Filename	Notes
		0 - 2 hours	2 - 8 hours	8 - 24 hours	1 - 4 days	4 - 30 days		
Reactor Building Roof Hatch	Intake A	1.49E-03	8.73E-04	3.46E-04	2.24E-04	1.70E-04	OYS1	
	Intake B	1.82E-03	1.09E-03	4.32E-04	2.71E-04	2.04E-04	OYS2	
Stack Tunnel Door	Intake A	7.70E-04	4.44E-04	1.78E-04	1.26E-04	8.71E-05	OYS3	
		8.19E-04	4.66E-04	1.85E-04	1.27E-04	9.64E-05	OYS4	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
	Intake B	8.55E-04	5.21E-04	2.05E-04	1.44E-04	9.42E-05	OYS5	
		8.29E-04	4.43E-04	1.84E-04	1.22E-04	9.21E-05	OYS6	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
East Airlock Door	Intake A	1.37E-03	9.67E-04	3.96E-04	2.66E-04	1.63E-04	OYS7	
		1.40E-03	1.06E-03	4.41E-04	2.63E-04	1.83E-04	OYS8	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
	Intake B	1.08E-03	7.85E-04	3.27E-04	2.21E-04	1.35E-04	OYS9	
		1.10E-03	8.18E-04	3.36E-04	1.98E-04	1.44E-04	OYS10	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.

Reactor Building Wall (Diffuse Area)	Intake A	2.05E-03	1.27E-03	5.56E-04	3.59E-04	2.97E-04	OYS11	Utilizes the release height, sigma z and building area based on the height of the Reactor Building above the Office Building.
		1.70E-03	1.10E-03	5.08E-04	3.22E-04	3.21E-04	OYS12	Utilizes the alternate release height, alternate sigma z, and alternate projected area based on the height of the entire Reactor Building
	Intake B	2.15E-03	1.25E-03	5.51E-04	3.84E-04	2.81E-04	OYS13	Utilizes the release height, sigma z and building area based on the height of the Reactor Building above the Office Building.
		1.64E-03	1.01E-03	4.60E-04	3.10E-04	2.43E-04	OYS14	Utilizes the alternate release height, alternate sigma z, and alternate projected area based on the height of the entire Reactor Building
D/W Access Facility (West Door)	Intake A	1.61E-03	1.20E-03	4.83E-04	2.94E-04	2.00E-04	OYS15	
	Intake B	1.22E-03	9.13E-04	3.69E-04	2.24E-04	1.53E-04	OYS17	
D/W Access Facility (South Door)	Intake A	1.93E-03	1.45E-03	6.16E-04	3.61E-04	2.55E-04	OYS16	
	Intake B	1.45E-03	1.08E-03	4.47E-04	2.65E-04	1.87E-04	OYS18	
Commodities Penetration on the Reactor Building South Wall	Intake A	1.55E-03	8.44E-04	3.56E-04	2.31E-04	1.73E-04	OYS19	
		1.67E-03	9.50E-04	3.74E-04	2.60E-04	1.95E-04	OYS20	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
	Intake B	1.76E-03	9.97E-04	4.03E-04	2.80E-04	2.01E-04	OYS21	
		1.77E-03	9.38E-04	3.88E-04	2.59E-04	1.93E-04	OYS22	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.

Commodities Penetration on the Reactor Building North Wall	Intake A	5.17E-03	4.02E-03	1.68E-03	1.06E-03	7.01E-04	OYS23	
		5.21E-03	3.91E-03	1.63E-03	9.67E-04	6.82E-04	OYS24	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
	Intake B	3.20E-03	2.51E-03	1.05E-03	6.43E-04	4.31E-04	OYS25	
		3.22E-03	2.43E-03	9.91E-04	5.84E-04	4.18E-04	OYS26	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
MAC Facility Personnel Airlock	Intake A	6.75E-03	5.13E-03	2.14E-03	1.27E-03	8.74E-04	OYS27	
		6.75E-03	5.10E-03	2.13E-03	1.26E-03	8.78E-04	OYS28	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
	Intake B	3.97E-03	2.95E-03	1.22E-03	7.18E-04	5.10E-04	OYS29	
		3.98E-03	2.96E-03	1.21E-03	7.17E-04	5.15E-04	OYS30	Utilizes the redirected projected area and direction to account for the redirected flow from the nearest taut string building edge to the intake per RG 1.194, Table A-2.
MAC Facility Entrance	Intake A	6.62E-03	5.05E-03	1.92E-03	1.33E-03	1.01E-03	OYS31	
	Intake B	3.90E-03	2.97E-03	1.10E-03	7.90E-04	5.63E-04	OYS32	

*** Shaded cells indicate the maximum X/Q value.**

4.0 References

1) *Regulatory Guide 1.183, "Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors"*; U.S. Nuclear Regulatory Commission; July 2000.

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

3) *Regulatory Guide 1.194; Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants*; U.S. Nuclear Regulatory Commission; June 2003.

4) *Regulatory Guide 1.23 (Safety Guide 23), Onsite Meteorological Programs*; U. S. Nuclear Regulatory Commission; USNRC Office of Standards Development; Washington, D.C.; 1972.

5) *XOQDOQ: Computer Program for the Meteorological Evaluation of Routine Releases at Nuclear Power Stations*; NUREG/CR-2919; J. F. Sagendorf, J. T. Goll, and W. F. Sandusky, U.S. Nuclear Regulatory Commission; Washington, D.C; 1982.

6) *Atmospheric Dispersion Estimates in the Vicinity of Buildings*; J. V. Ramsdell and C. J. Fosmire, Pacific Northwest Laboratory; 1995.

7) Washington Group International phone conversation with Mr. Steve LaVie of NRC, May 17, 2004.

8) Sketch by Russell Smith (Exelon); provided via e-mail on 9/19/07.

9) Oyster Creek 1995-1999 Meteorological Tower Data; provided via e-mail from Tom Mscisz (Exelon) on 2/23/2007.

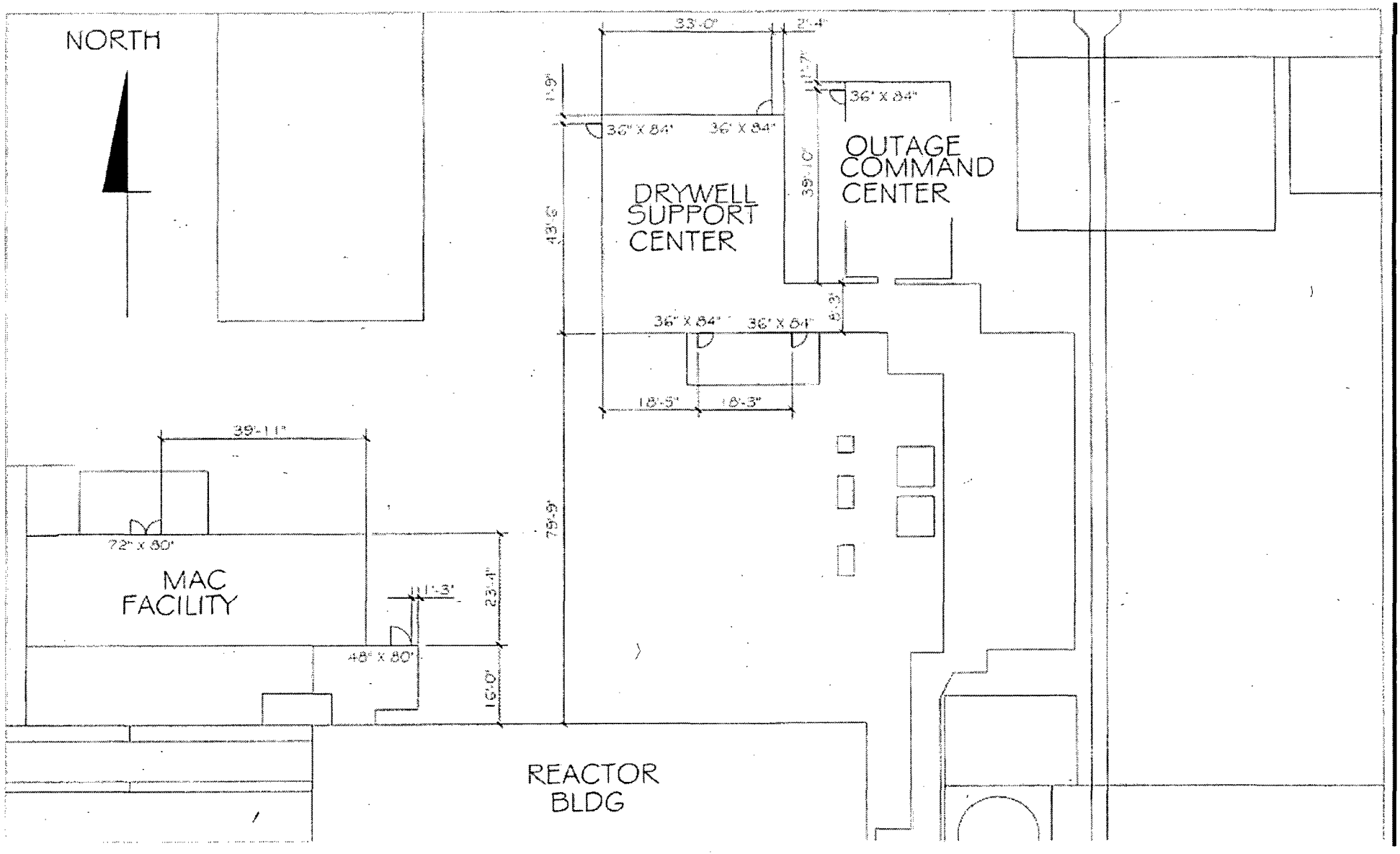
10) Sketches by John Yuen (Exelon); provided via e-mail from Tom Mscisz (Exelon) on 9/7/2007.

11) Drawing 3E-153-02-002, *General Arrangement, Reactor Building, Plan Floor Elevation 23'-6"*, Revision 10, 12/6/96.

12) Drawing 3E-153-32-001, *Reactor Bldg. El. 23'-6", Tornado Missile Shield Concrete Plans and Sections*, Revision 0, 9/26/90.

13) Height of the base of the MAC Facility Door and the MAC Facility building height, provided via e-mail from Jessica DeLaRosa (Exelon) on 9/20/07.

14) Drawing 3E-153-02-007, *General Arrangement, Reactor Building, Section A-A*, Revision 4.


NORTH
33'-0"
2'-4"
1'-7"
36" X 84"
1'-9"
36" X 84"
36" X 84"
OUTAGE
COMMAND
CENTER
39'-10"
DRYWELL
SUPPORT
CENTER
43'-6"
8'-3"
36" X 84"
36" X 84"
18'-5"
18'-3"
39'-11"
72" X 80"
MAC
FACILITY
11'-3"
23'-1"
48" X 80"
16'-0"
79'-9"
REACTOR
BLDG

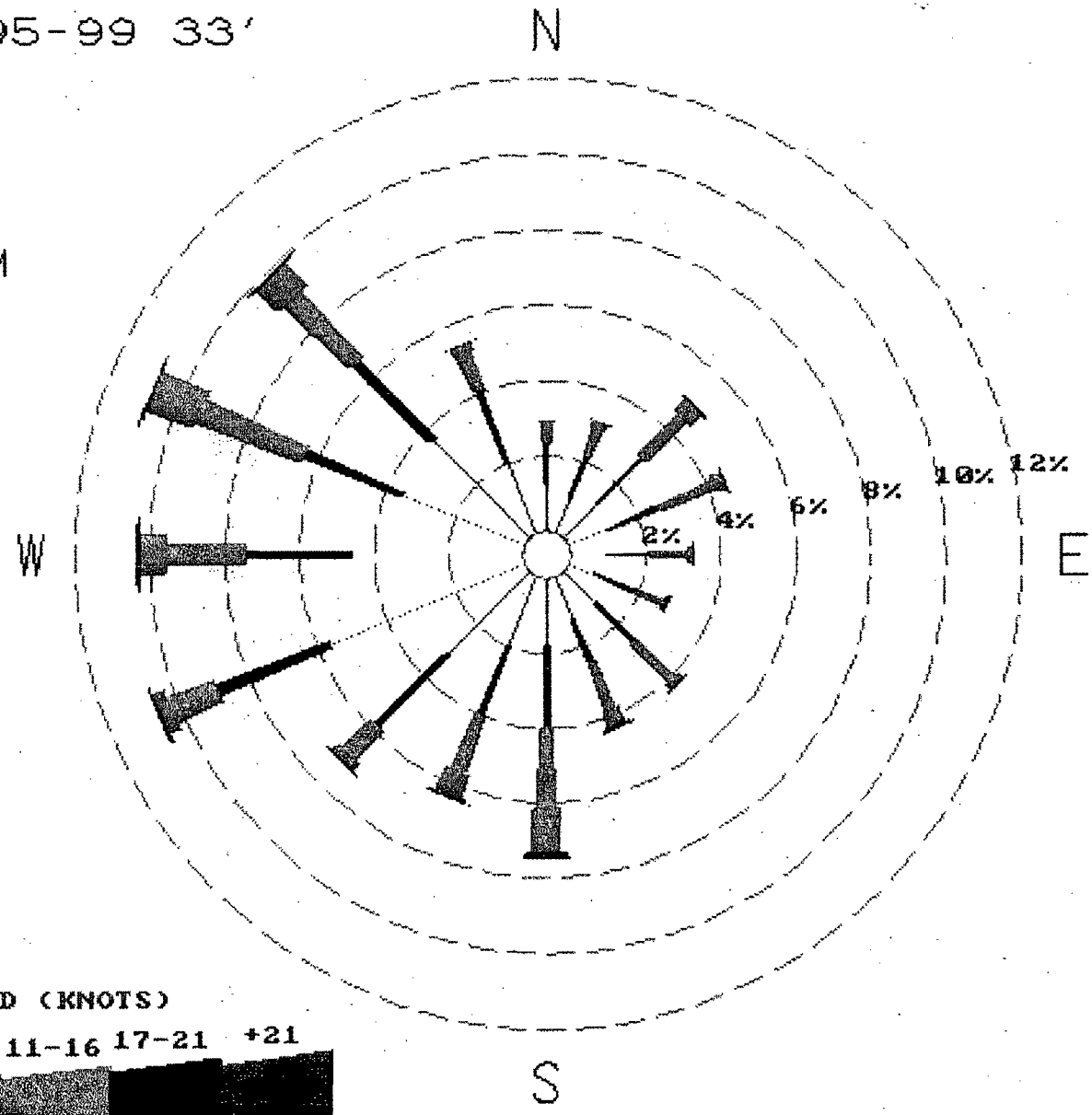
Oyster Creek 95-99 33'

January 1

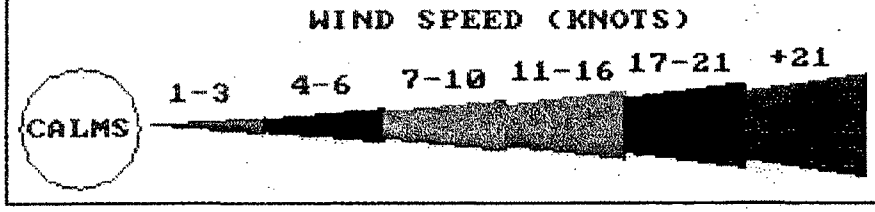
December 31

Midnight-11 PM

NOTE: Frequencies indicate direction from which the wind is blowing.



CALM WINDS 1.61%



Oyster Creek 95-99 150'

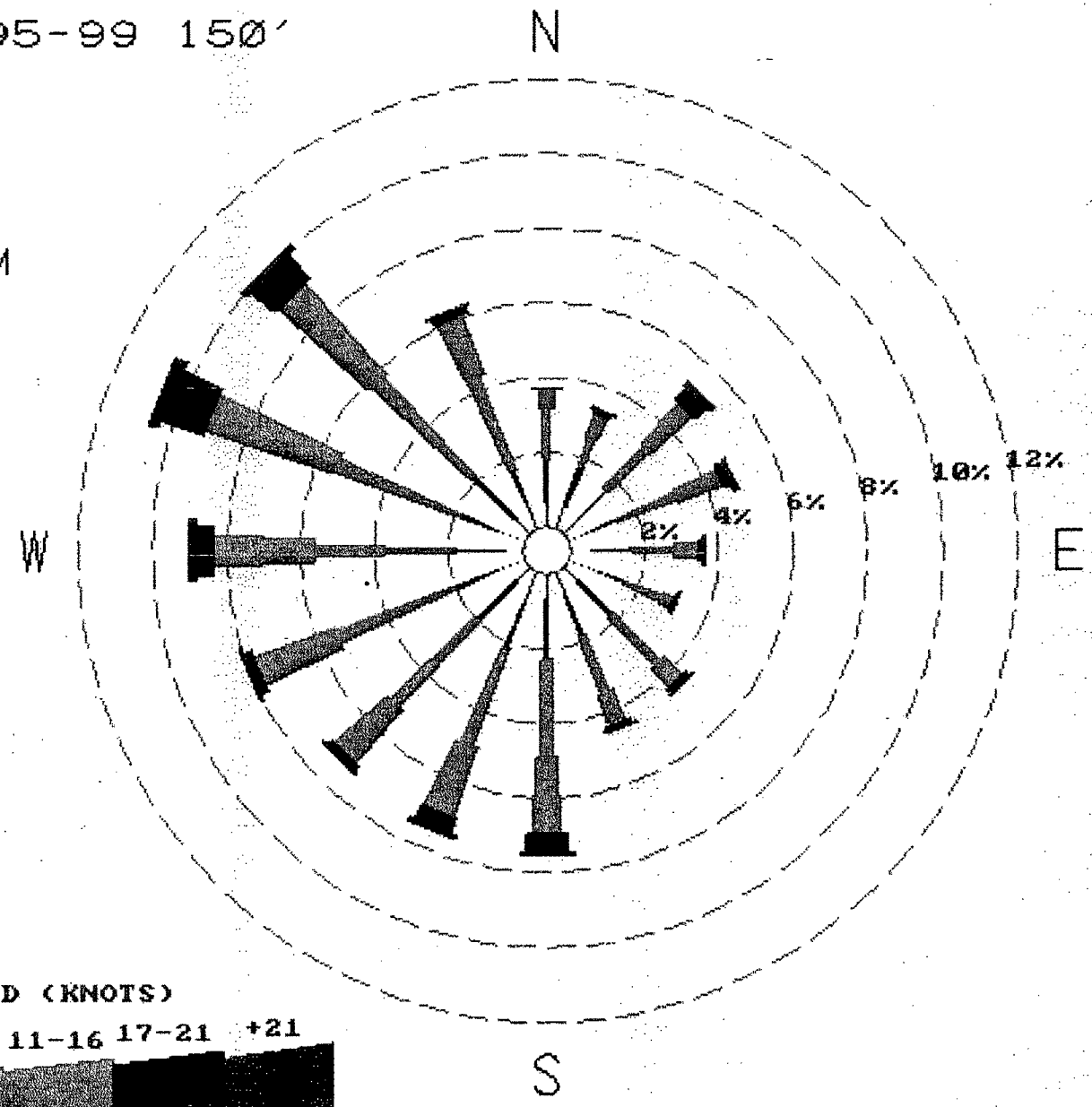
January 1

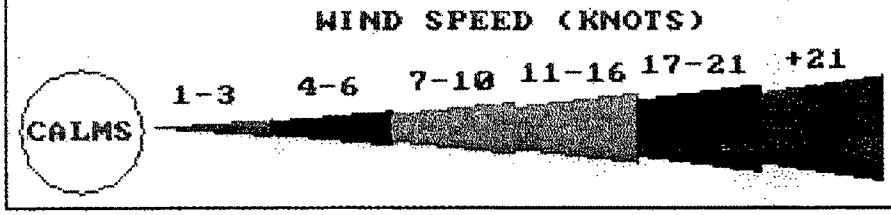
December 31

Midnight-11 PM

NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 0.28%





Oyster Creek
Joint Frequency Distribution
1995-1999
33 ft wind
150-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category																			
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	Calms	Total
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1		
	3	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3		
	4	0	0	1	2	1	0	1	0	1	0	0	0	0	3	0	1	10		
	5	0	1	2	0	2	3	1	2	1	2	2	2	2	6	2	1	29		
	6	3	4	2	11	12	4	4	4	4	4	5	4	8	9	8	5	91		
	7	11	9	13	42	38	24	29	14	15	11	18	17	20	21	33	15	330		
	8	29	25	44	63	96	110	92	31	76	42	56	60	58	71	68	58	979		
	9	26	30	97	188	166	182	198	69	54	32	41	92	111	126	146	85	1643		
	10	27	13	80	159	92	58	179	134	109	57	60	84	133	179	217	71	1652		
	11	6	6	31	59	24	7	53	79	179	51	28	49	85	220	163	52	1092		
	12	3	0	13	13	4	0	3	26	142	69	20	26	72	165	140	25	721		
	13	0	0	0	0	0	0	0	0	19	14	5	3	16	17	10	2	86		
	14	0	0	0	0	0	0	0	0	0	1	3	0	0	6	3	1	14	1	6652
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	4		
	4	0	2	1	2	1	0	1	0	0	1	1	0	1	0	0	0	10		
	5	1	0	3	2	2	0	2	0	1	2	1	1	1	0	5	1	22		
	6	5	6	5	3	7	3	3	5	2	1	3	6	2	2	4	2	59		
	7	9	6	7	11	18	10	9	10	7	7	7	10	16	12	10	3	152		
	8	21	26	35	42	43	29	42	29	31	28	30	45	29	34	47	42	553		
	9	16	15	30	42	30	35	43	68	33	21	22	43	55	63	52	36	604		
	10	9	2	14	18	7	5	19	34	46	26	12	30	43	44	46	33	388		
	11	1	0	8	6	9	8	6	8	32	18	5	11	21	38	28	16	215		
	12	0	1	2	0	2	0	2	5	32	23	7	13	13	45	34	6	185		
	13	0	0	0	0	0	0	0	0	2	2	1	0	4	6	3	0	18		
	14	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	4	0	2214
3 (C)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	4		
	4	0	3	3	0	1	0	1	0	0	0	0	0	1	1	0	0	10		
	5	1	1	1	2	0	3	0	0	1	2	2	3	0	0	1	0	17		
	6	2	2	2	2	2	4	3	3	1	1	3	1	2	4	2	2	36		
	7	4	6	10	6	7	5	9	5	4	8	6	6	10	7	10	8	111		
	8	23	18	21	14	22	18	14	12	19	9	12	19	28	21	29	22	301		
	9	8	3	23	22	10	10	38	27	20	9	8	17	19	26	21	21	282		
	10	5	2	4	11	3	2	12	15	31	17	6	13	16	20	17	14	188		
	11	1	0	4	3	6	1	1	1	22	10	3	4	9	21	9	6	101		
	12	0	0	0	0	1	0	1	3	10	9	2	3	15	20	14	3	81		
	13	0	0	0	0	0	0	0	0	0	1	2	1	1	5	3	0	13		
	14	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	3	0	1147
4 (D)	2	2	4	1	3	0	2	1	0	1	1	2	2	1	0	5	5	30		
	3	10	10	10	3	4	2	5	3	7	7	7	5	5	9	5	5	97		
	4	15	18	21	11	11	10	14	12	12	9	11	11	11	8	11	18	203		
	5	17	20	22	20	16	11	28	15	19	13	12	12	21	22	20	22	290		
	6	31	37	36	40	22	17	34	26	23	26	23	23	35	39	26	27	465		
	7	67	76	87	76	65	35	74	52	68	48	36	47	57	51	89	79	1007		
	8	158	157	252	143	133	104	171	171	203	129	94	121	133	149	217	194	2529		
	9	90	94	226	150	93	92	102	124	197	140	76	121	145	161	179	135	2125		
	10	44	52	138	133	95	47	36	50	146	129	52	73	96	135	124	67	1417		
	11	9	17	76	86	48	19	26	23	82	98	24	35	54	110	90	36	833		
	12	12	5	51	41	24	16	28	29	80	105	28	24	45	97	65	26	678		
	13	3	3	11	7	10	6	4	10	32	38	6	2	6	17	10	1	166		
	14	0	0	0	0	0	2	1	1	5	13	0	0	1	1	0	0	24	26	9888
5 (E)	2	6	2	2	1	3	5	3	3	4	6	6	4	2	6	4	3	60		
	3	19	13	19	6	6	8	8	9	15	16	11	15	14	13	17	14	203		
	4	25	24	18	20	18	3	26	37	45	38	47	35	39	33	47	32	487		
	5	18	28	34	23	25	15	18	27	30	43	47	42	42	40	51	31	514		
	6	23	37	36	30	34	15	26	31	55	65	71	81	66	56	77	55	758		
	7	61	42	68	62	54	21	68	75	118	158	171	214	134	148	154	108	1656		
	8	120	92	139	101	92	39	74	83	234	309	398	445	394	380	387	260	3547		
	9	106	76	102	57	70	44	51	48	152	276	261	218	209	288	239	167	2364		
	10	51	64	63	41	48	18	35	45	113	159	89	69	112	207	139	79	1332		
	11	25	55	39	21	16	7	11	44	50	76	35	15	34	122	94	38	682		
	12	12	25	45	26	6	13	28	40	51	62	13	13	29	62	37	24	486		
	13	1	0	11	9	3	0	3	18	23	11	1	1	3	11	2	2	99		
	14	0	0	0	2	2	0	1	8	9	0	0	0	0	0	1	0	23	58	12269
6 (F)	2	2	4	1	0	0	1	1	4	2	5	5	3	2	4	2	4	40		
	3	3	8	7	6	8	5	8	9	11	16	18	17	20	17	16	9	178		
	4	13	6	9	5	9	6	8	15	17	22	22	34	52	40	49	26	333		
	5	7	13	7	3	2	2	6	16	20	36	43	40	53	41	41	18	348		
	6	10	9	3	6	6	4	10	25	37	39	50	81	94	56	53	37	520		
	7	24	5	14	9	8	3	10	20	50	76	102	212	157	145	163	85	1083		
	8	21	8	6	6	4	4	12	11	37	86	142	317	222	171	177	108	1332		
	9	2	2	4	2	1	1	0	4	9	10	31	32	31	25	22	13	189		
	10	1	0	2	0	1	4	1	0	5	8	6	4	7	10	5	4	58		
	11	0	0	1	0	0	0	3	0	4	0	2	1	3	4	0	0	18		
	12	0	0	2	0	0	1	0	0	1	1	0	0	3	6	3	0	17		
	13	0	0	1	2	0	0	0	0	1	0	0	0	0	0	0	0	4		
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	4194
7 (G)	2	11	7	4	2	2	1	0	0	4	11	10	14	32	23	30	9	160		
	3	19	9	5	5	8	5	7	10	24	20	31	69	114	96	79	32	533		
	4	17	7	8	5	5	6	9	10	32	33	62	187	178	137	101	54	851		
	5	12	3	7	1	2	3	6	5	13	29	59	172	213	123	94	33	775		
	6	5	4	1	5	3	1	8	14	28	27	87	284	317	146	120	60	1110		
	7	24	7	7	5	6	0	4	10	24	29	105	493	367	119	155	116	1471		
	8	17	1	8	1	1	2	2	4	15	15	56	216	120	44	56	80	638		
	9	2	2	5	1	1	1	4	1	3	3	1	2	1	4	1	4	36		
	10	1	1	8	0	0	0	0	2	3	0	1	0	3	3	2	0	24		
	11	0	0	1	0	0	0	0	2	2	0	2	1	2	4	1	0	15		
	12	0	0	0	0	0	0	0	0	2	0	1	2	1	0	0	0	6		
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231	5851
																				42215

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
1 (Calm)	<0.93
2	>=0.93 to <1.12
3	>=1.12 to <1.68
4	>=1.68 to <2.24
5	>=2.24 to <2.80
6	>=2.80 to <3.36
7	>=3.36 to <4.47
8	>=4.47 to <6.71
9	>=6.71 to <8.95
10	>=8.95 to <11.18
11	>=11.18 to <13.42
12	>=13.42 to <17.90
13	>=17.90 to <22.37
14	>=22.37

Oyster Creek

Joint Frequency Distribution
1995-1999
33 ft wind
150-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	0.002369	0	0	0	0.002369		
	3	0.002368826	0	0	0	0	0	0	0	0	0.002369	0	0.002369	0	0	0	0	0.007106		
	4	0	0	0.002369	0.004738	0.002369	0	0.002369	0	0.002369	0	0	0	0	0.007106	0	0.002369	0.023688		
	5	0	0.002369	0.004738	0	0.004738	0.007106	0.002369	0.004738	0.002369	0.004738	0.004738	0.004738	0.004738	0.014213	0.004738	0.002369	0.068696		
	6	0.007106479	0.009475	0.004738	0.026057	0.028426	0.009475	0.009475	0.009475	0.009475	0.009475	0.011844	0.009475	0.018951	0.021319	0.018951	0.011844	0.215563		
	7	0.026057089	0.021319	0.030795	0.099491	0.090015	0.056852	0.068696	0.033164	0.035532	0.026057	0.042639	0.04027	0.047377	0.049745	0.078171	0.035532	0.781713		
	8	0.068695961	0.059221	0.104228	0.149236	0.227407	0.260571	0.217932	0.073434	0.180031	0.099491	0.132654	0.14213	0.137392	0.168187	0.16108	0.137392	2.319081		
	9	0.061589482	0.071065	0.229776	0.445339	0.393225	0.431126	0.469028	0.163449	0.127917	0.075802	0.097122	0.217932	0.26294	0.298472	0.345849	0.20135	3.891982		
	10	0.063958309	0.030795	0.189506	0.376643	0.217932	0.137392	0.42402	0.317423	0.258202	0.135023	0.14213	0.198981	0.315054	0.42402	0.514035	0.168187	3.913301		
	11	0.014212957	0.014213	0.073434	0.139761	0.056852	0.016582	0.125548	0.187137	0.42402	0.12081	0.066327	0.116072	0.20135	0.521142	0.386119	0.123179	2.586758		
	12	0.007106479	0	0.030795	0.030795	0.009475	0	0.007106	0.061589	0.336373	0.163449	0.047377	0.061589	0.170555	0.390856	0.331636	0.059221	1.707924		
	13	0	0	0	0	0	0	0	0	0.045008	0.033164	0.011844	0.007106	0.037901	0.04027	0.023688	0.004738	0.203719		
	14	0	0	0	0	0	0	0	0	0	0.002369	0.007106	0	0	0.014213	0.007106	0.002369	0.033164	0.002369	15.75743
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0.002369	0	0.002369	0	0	0.002369	0	0	0	0	0	0	0	0.002369	0	0.009475		
	4	0	0.004738	0.002369	0.004738	0.002369	0	0.002369	0	0	0.002369	0.002369	0	0.002369	0	0	0	0.023688		
	5	0.002368826	0	0.007106	0.004738	0.004738	0	0.004738	0	0.002369	0.004738	0.002369	0.002369	0.002369	0	0.011844	0.002369	0.052114		
	6	0.011844131	0.014213	0.011844	0.007106	0.016582	0.007106	0.007106	0.011844	0.004738	0.002369	0.007106	0.014213	0.004738	0.004738	0.009475	0.004738	0.139761		
	7	0.021319436	0.014213	0.016582	0.026057	0.042639	0.023688	0.021319	0.023688	0.016582	0.016582	0.016582	0.023688	0.037901	0.028426	0.023688	0.007106	0.360062		
	8	0.049745351	0.061589	0.082909	0.099491	0.10186	0.068696	0.099491	0.068696	0.073434	0.066327	0.071065	0.106597	0.068696	0.08054	0.111335	0.099491	1.309961		
	9	0.03790122	0.035532	0.071065	0.099491	0.071065	0.082909	0.10186	0.16108	0.078171	0.049745	0.052114	0.10186	0.130285	0.149236	0.123179	0.085278	1.430771		
	10	0.021319436	0.004738	0.033164	0.042639	0.016582	0.011844	0.045008	0.08054	0.108966	0.061589	0.028426	0.071065	0.10186	0.104228	0.108966	0.078171	0.919105		
	11	0.002368826	0	0.018951	0.014213	0.021319	0.018951	0.014213	0.018951	0.075802	0.042639	0.011844	0.026057	0.049745	0.090015	0.066327	0.037901	0.509298		
	12	0	0.002369	0.004738	0	0.004738	0	0.004738	0.011844	0.075802	0.054483	0.016582	0.030795	0.030795	0.106597	0.08054	0.014213	0.438233		
	13	0	0	0	0	0	0	0	0	0.004738	0.004738	0.002369	0	0.009475	0.014213	0.007106	0	0.042639		
	14	0	0	0	0	0	0	0	0	0.002369	0	0	0	0	0.007106	0	0	0.009475	0	5.244581
3 (C)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0.002369	0	0.002369	0	0	0.002369	0	0	0	0	0	0	0.002369	0	0.009475		
	4	0	0.007106	0.007106	0	0.002369	0	0.002369	0	0	0	0	0	0.002369	0.002369	0	0	0.023688		
	5	0.002368826	0.002369	0.002369	0.004738	0	0.007106	0	0	0.002369	0.004738	0.004738	0.007106	0	0	0.002369	0	0.04027		
	6	0.004737652	0.004738	0.004738	0.004738	0.004738	0.009475	0.007106	0.007106	0.002369	0.002369	0.007106	0.002369	0.004738	0.009475	0.004738	0.004738	0.085278		
	7	0.009475305	0.014213	0.023688	0.014213	0.016582	0.011844	0.021319	0.011844	0.009475	0.018951	0.014213	0.014213	0.023688	0.016582	0.023688	0.018951	0.26294		
	8	0.054483004	0.042639	0.049745	0.033164	0.052114	0.042639	0.033164	0.028426	0.045008	0.021319	0.028426	0.045008	0.066327	0.049745	0.068696	0.052114	0.713017		
	9	0.01895061	0.007106	0.054483	0.052114	0.023688	0.023688	0.090015	0.063958	0.047377	0.021319	0.018951	0.04027	0.045008	0.061589	0.049745	0.049745	0.668009		
	10	0.011844131	0.004738	0.009475	0.026057	0.007106	0.004738	0.028426	0.035532	0.073434	0.04027	0.014213	0.030795	0.037901	0.047377	0.04027	0.033164	0.445339		
	11	0.002368826	0	0.009475	0.007106	0.014213	0.002369	0.002369	0.002369	0.052114	0.023688	0.007106	0.009475	0.021319	0.049745	0.021319	0.014213	0.239251		
	12	0	0	0	0	0.002369	0	0.002369	0.007106	0.023688	0.021319	0.004738	0.007106	0.035532	0.047377	0.033164	0.007106	0.191875		
	13	0	0	0	0	0	0	0	0	0	0.002369	0.004738	0.002369	0.002369	0.011844	0.007106	0	0.030795		
	14	0	0	0	0	0	0	0	0	0.002369	0	0.002369	0	0	0	0.002369	0	0.007106	0	2.717044
4 (D)	2	0.004737652	0.009475	0.002369	0.007106	0	0.004738	0.002369	0	0.002369	0.002369	0.004738	0.004738	0.002369	0	0.011844	0.011844	0.071065		
	3	0.023688262	0.023688	0.023688	0.007106	0.009475	0.004738	0.011844	0.007106	0.016582	0.016582	0.016582	0.011844	0.011844	0.021319	0.011844	0.011844	0.229776		
	4	0.035532394	0.042639	0.049745	0.026057	0.026057	0.023688	0.033164	0.028426	0.028426	0.021319	0.026057	0.026057	0.026057	0.018951	0.026057	0.042639	0.480872		
	5	0.040270046	0.047377	0.052114	0.047377	0.037901	0.026057	0.066327	0.035532	0.045008	0.030795	0.028426	0.028426	0.049745	0.052114	0.047377	0.052114	0.68696		
	6	0.073433614	0.087647	0.085278	0.094753	0.052114	0.04027	0.08054	0.061589	0.054483	0.061589	0.054483	0.054483	0.082909	0.092384	0.061589	0.063958	1.101504		
	7	0.158711359	0.180031	0.206088	0.180031	0.153974	0.082909	0.175293	0.123179	0.16108	0.113704	0.085278	0.111335	0.135023	0.12081	0.210826	0.187137	2.385408		
	8	0.374274547	0.371906	0.596944	0.338742	0.315054	0.246358	0.405069	0.405069	0.480872	0.305579	0.22267	0.286628	0.315054	0.352955	0.514035	0.459552	5.990762		
	9	0.213194362	0.22267	0.535355	0.355324	0.220301	0.217932	0.24162	0.293734	0.466659	0.331636	0.180031	0.286628	0.34348	0.381381	0.42402	0.319792	5.033756		
	10	0.104228355	0.123179	0.326898	0.315054	0.225038	0.111335	0.085278	0.118441	0.345849	0.305579	0.123179	0.172924	0.227407	0.319792	0.293734	0.158711	3.356627		
	11	0.021319436	0.04027	0.180031	0.203719	0.113704	0.045008	0.061589	0.054483	0.194244	0.232145	0.056852	0.082909	0.127917	0.260571	0.213194	0.085278	1.973232		
	12	0.028425915	0.011844	0.12081	0.097122	0.056852	0.037901	0.066327	0.068696	0.189506	0.248727	0.066327	0.056852	0.106597	0.229776	0.153974	0.061589	1.601327		
	13	0.007106479	0.007106	0.026057	0.016582	0.023688	0.014213	0.009475	0.023688	0.075802	0.090015	0.014213	0.004738	0.014213	0.04027	0.023688	0.002369	0.393225		
	14	0	0	0	0	0	0.004738	0.002369	0.002369	0.011844	0.030795	0	0	0.002369	0.002369	0	0	0.056852	0.061589	23.42295
5 (E)	2	0.014212957	0.004738	0.004738	0.002369	0.007106	0.011844	0.007106	0.007106	0.009475	0.014213	0.014213	0.009475	0.004738	0.014213	0.009475	0.007106	0.14213		
	3	0.045007699	0.030795	0.045008	0.014213	0.014213	0.018951	0.018951	0.021319	0.035532	0.037901	0.026057	0.035532	0.033164	0.030795	0.04027	0.033164	0.480872		
	4	0.059220656	0.056852	0.042639	0.047377	0.042639	0.007106	0.061589	0.087647	0.106597	0.090015	0.111335	0.082909	0.092384	0.078171	0.111335	0.075802	1.153618		
	5	0.042638872	0.066327	0.08054	0.054483	0.059221	0.035532	0.042639	0.063958	0.071065	0.10186	0.111335	0.099491	0.099491	0.094753	0.12081	0.073434	1.217577		
	6	0.054483004	0.087647	0.085278	0.071065	0.08054	0.035532	0.061589	0.073434	0.130285	0.153974	0.168187	0.191875	0.156343	0.132654	0.1824	0.130285	1.79557		
	7	0.144498401	0.099491	0.16108	0.146867	0.127917	0.049745	0.16108	0.177662	0.279521	0.374275	0.405069	0.506929	0.317423	0.350586	0.364799	0.255833	3.922776		
	8	0.28425915	0.217932	0.329267	0.239251	0.217932	0.092384	0.175293	0.196613	0.554305	0.731967	0.942793	1.054128	0.933318	0.900154	0.916736	0.615895	8.402227		
	9	0.251095582	0.180031	0.24162	0.135023	0.165818	0.104228	0.12081	0.113704	0.360062	0.653796	0.618264	0.516404	0.495085	0.682222	0.566149	0.395594	5.599905		
	10	0.120810139	0.151605	0.149236	0.097122	0.113704	0.042639	0.082909	0.106597	0.267677	0.376643	0.210826	0.163449	0.265309	0.490347	0.329267	0.187137	3.155277		
	11	0.059220656	0.130285	0.092384	0.049745	0.037901	0.016582	0.026057	0.104228	0.118441	0.180031	0.082909	0.035532	0.08054	0.288997	0.22267	0.090015	1.61554		
	12	0.028425915	0.059221	0.106597	0.061589	0.014213	0.030795	0.066327	0.094753	0.12081	0.146867	0.030795	0.030795	0.068696	0.146867	0.087647	0.056852	1.15125		
	13	0.002368826	0	0.026057	0.021319	0.007106	0	0.007106	0.042639	0.054483	0.026057	0.002369	0.002369	0.007106	0.026057	0.004738	0.004738	0.234514		
	14	0	0	0	0.004738	0.004738	0	0.002369	0.018951	0.021319	0	0	0	0	0	0.002369	0	0.054483	0.137392	29.06313
6 (F)	2	0.004737652	0.009475	0.002369	0	0	0.002369	0.002369	0.009475	0.004738	0.011844	0.011844	0.007106	0.004738	0.009475	0.004738	0.009475	0.094753		
	3	0.007106479	0.018951	0.016582	0.014213	0.018951	0.011844	0.018951	0.021319	0.026057	0.037901	0.042639	0.04027	0.047377	0.04027	0.037901	0.021319	0.421651		
	4	0.030794741	0.014213	0.021319	0.011844	0.021319	0.014213	0.018951	0.035532	0.04027	0.052114	0.052114	0.08054	0.123179	0.094753	0.116072	0.061589	0.788819		
	5	0.016581784	0.030795	0.016582	0.007106	0.004738	0.004738	0.014213	0.037901	0.047377	0.085278	0.10186	0.094753	0.125548	0.097122	0.097122	0.042639	0.824352		
	6	0.023688262	0.021319	0.007106	0.014213	0.014213	0.009475	0.023688	0.059221	0.087647	0.092384	0.118441	0.191875	0.22267	0.132654	0.125548	0.087647	1.23179		
	7	0.05685183	0.011844	0.033164	0.021319	0.018951	0.007106	0.023688	0.047377	0.118441	0.180031	0.24162	0.502191	0.371906	0.34348	0.386119	0.20135	2.565439		
	8	0.049745351	0.018951	0.014213	0.014213	0.009475	0.009475	0.028426	0.026057	0.087647	0.203719	0.336373	0.750918	0.525879	0.405069	0.419282	0.255833	3.155277		
	9	0.004737652	0.004738	0.009475	0.004738	0.002369	0.002369	0	0.009475	0.021319	0.023688	0.073434	0.075802	0.073434	0.059221	0.052114	0.030795	0.447708		
	10	0.002368826	0	0.004738	0	0.002369	0.009475	0.002369	0	0.011844	0.018951	0.014213	0.009475	0.016582	0.023688	0.011844	0.009475	0.137392		
	11	0	0	0.002369	0	0	0	0.007106	0	0.009475	0	0.004738	0.002369	0.007106	0.009475	0	0	0.042639		
	12	0	0	0.004738	0	0	0.002369	0	0	0.002369	0.002369	0	0	0.007106	0.014213	0.007106	0	0.04027		
	13	0	0	0.002369	0.004738	0	0	0	0	0.002369	0	0	0	0	0	0	0	0.009475		
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.175293	9.934857
7 (G)	2	0.026057089	0.016582	0.009475	0.004738	0.004738	0.002369	0	0	0.009475	0.026057	0.023688	0.033164	0.075802	0.054483	0.071065	0.021319	0.379012		
	3	0.045007699	0.021319	0.011844	0.011844	0.018951	0.011844	0.016582	0.023688	0.056852	0.047377	0.073434	0.163449	0.270046	0.227407	0.187137	0.075802	1.262584		
	4	0.040270046	0.016582	0.018951	0.011844	0.011844	0.014213	0.021319	0.023688	0.075802	0.078171	0.146867	0.442971	0.421651	0.324529	0.239251	0.127917	2.015871		
	5	0.028425915	0.007106	0.016582	0.002369	0.004738	0.007106	0.014213	0.011844	0.030795	0.068696	0.139761	0.407438	0.50456	0.291366	0.22267	0.078171	1.83584		
	6	0.011844131	0.009475	0.002369	0.011844	0.007106	0.002369	0.018951	0.033164	0.066327	0.063958	0.206088	0.672747	0.750918	0.345849	0.284259	0.14213	2.629397		
	7	0.05685183	0.016582	0.016582	0.011844	0.014213	0	0.009475	0.023688	0.056852	0.068696	0.248727	1.167831	0.869359	0.28189	0.367168	0.274784	3.484543		
	8	0.040270046	0.002369	0.018951	0.002369	0.002369	0.004738	0.004738	0.009475	0.035532	0.035532	0.132654	0.511666	0.284259	0.104228	0.132654	0.189506	1.511311		
	9	0.004737652	0.004738	0.011844	0.002369	0.002369	0.002369	0.009475	0.002369	0.007106	0.007106	0.002369	0.004738	0.002369	0.009475	0.002369	0.009475	0.085278		
	10	0.002368826	0.002369	0.018951	0	0	0	0	0.004738	0.007106	0	0.002369	0	0.007106	0.007106	0.004738	0	0.056852		
	11	0	0	0.002369	0	0	0	0	0.004738	0.004738	0	0.004738	0.002369	0.004738	0.009475	0.002369	0	0.035532		
	12	0	0	0	0	0	0	0	0	0.004738	0	0.002369	0.004738	0.002369	0	0	0	0.014213		
	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002369	0	0.002369		
	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.547199	13.86
																		99.07616		100

All Stability Classes	2	0.049745351	0.04027	0.018951	0.014213	0.011844	0.021319	0.011844	0.016582	0.026057	0.054483	0.054483	0.054483	0.090015	0.078171	0.097122	0.049745	0.689328
	3	0.080540092	0.078171	0.106597	0.037901	0.045008	0.035532	0.052114	0.056852	0.085278	0.094753	0.087647	0.090015	0.099491	0.099491	0.099491	0.066327	1.215208
	4	0.144498401	0.20135	0.267677	0.248727	0.177662	0.092384	0.220301	0.381381	0.743811	0.440602	0.251096	0.296103	0.506929	1.073078	0.840933	0.369537	6.25607
	5	0.063958309	0.073434	0.267677	0.189506	0.087647	0.071065	0.146867	0.243989	0.753287	0.637214	0.168187	0.191875	0.421651	0.935686	0.694066	0.198981	5.145091
	6	0.009475305	0.007106	0.054483	0.042639	0.030795	0.014213	0.016582	0.066327	0.1824	0.156343	0.035532	0.016582	0.071065	0.132654	0.068696	0.011844	0.916736
	7	0	0	0	0.004738	0.004738	0.004738	0.004738	0.021319	0.037901	0.033164	0.009475	0	0.002369	0.023688	0.011844	0.002369	0.16108

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
1 (Calm)	<0.93
2	>=0.93 to <1.12
3	>=1.12 to <1.68
4	>=1.68 to <2.24
5	>=2.24 to <2.80
6	>=2.80 to <3.36
7	>=3.36 to <4.47
8	>=4.47 to <6.71
9	>=6.71 to <8.95
10	>=8.95 to <11.18
11	>=11.18 to <13.42
12	>=13.42 to <17.90
13	>=17.90 to <22.37
14	>=22.37

Oyster Creek

Joint Frequency Distribution
1995-1999
150 ft wind
150-33 ft Delta T

	Wind Speed Category(1)	Wind Direction Category																		
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total	Calms	Total
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		
	4	0	0	0	1	0	0	0	2	1	0	0	0	1	0	0	0	5		
	5	1	1	0	1	1	3	0	1	2	0	0	0	0	1	1	0	12		
	6	0	1	2	1	0	2	1	3	1	2	2	2	0	1	0	1	19		
	7	3	7	6	5	21	16	10	3	2	6	8	4	3	8	7	3	112		
	8	21	13	27	64	58	57	72	30	31	29	24	24	30	22	33	19	554		
	9	25	19	18	62	88	118	108	33	37	38	43	50	47	57	64	39	846		
	10	30	21	51	129	111	114	185	73	45	31	23	54	73	78	83	46	1147		
	11	24	11	57	135	64	32	122	119	84	49	37	81	94	87	111	51	1158		
	12	13	14	83	122	56	11	67	100	217	92	43	92	159	216	272	87	1644		
	13	4	5	32	26	7	0	2	14	82	72	23	32	76	199	174	50	798		
	14	0	0	10	3	3	0	0	2	17	28	12	16	46	108	97	14	356	0	6652
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	4	1	0	0	1	1	0	1	1	0	0	0	1	0	0	1	0	7		
	5	0	2	1	2	0	0	0	1	0	1	0	0	1	0	0	1	9		
	6	3	0	1	3	1	3	2	0	2	1	2	2	1	0	1	1	23		
	7	3	5	3	7	10	10	5	1	7	2	2	5	3	1	8	2	74		
	8	16	19	13	21	32	11	32	22	18	22	18	21	28	20	16	9	318		
	9	17	11	18	26	28	28	31	27	17	21	17	27	23	26	38	24	379		
	10	16	6	22	33	22	14	30	58	34	16	8	28	35	33	39	20	414		
	11	4	5	15	16	8	7	18	25	36	13	11	24	46	42	33	26	329		
	12	4	1	19	19	10	10	7	17	39	35	8	28	41	45	49	29	361		
	13	0	2	6	6	4	0	2	2	27	19	8	12	20	43	39	10	200		
	14	0	0	3	0	1	0	1	1	3	6	5	6	9	37	22	6	100	0	2214
3 (C)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1		
	4	1	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	6		
	5	0	0	1	0	0	2	1	1	0	0	0	0	1	1	0	0	7		
	6	1	2	2	2	0	1	0	1	0	3	3	3	0	0	1	3	22		
	7	5	6	6	1	4	6	4	4	4	2	0	1	2	3	2	2	52		
	8	11	11	13	12	19	14	17	6	12	6	13	12	16	14	16	12	204		
	9	16	8	7	5	11	10	18	13	12	9	6	10	20	11	20	15	191		
	10	5	4	12	17	9	5	15	25	19	4	2	5	12	20	17	8	179		
	11	4	3	9	7	4	2	15	11	21	14	7	11	19	17	15	9	168		
	12	4	1	8	9	6	1	2	3	26	27	4	14	13	22	23	9	172		
	13	1	0	4	4	2	0	1	2	6	9	3	5	8	20	12	6	83		
	14	0	0	0	0	0	0	1	0	1	4	4	2	11	19	18	2	62	0	1147
4 (D)	2	1	2	3	0	0	1	0	0	2	0	0	0	1	0	1	0	11		
	3	5	3	5	2	4	3	2	3	2	4	4	2	2	2	2	2	47		
	4	7	7	9	4	6	4	8	3	3	3	5	5	5	3	7	9	88		
	5	9	14	5	6	8	5	7	7	13	3	4	3	7	2	6	4	103		
	6	13	16	14	13	11	12	14	14	12	13	11	8	10	7	11	11	190		
	7	27	32	37	20	32	30	46	36	29	15	34	17	31	29	27	31	473		
	8	79	93	94	83	96	82	98	117	97	93	54	56	69	84	92	119	1406		
	9	118	84	110	95	90	51	101	142	152	102	59	80	80	79	117	109	1569		
	10	97	69	109	87	72	60	89	95	143	104	59	68	104	100	112	123	1491		
	11	58	60	117	87	54	64	48	54	114	107	52	74	96	107	123	92	1307		
	12	43	61	171	177	96	43	42	35	121	196	57	93	133	179	172	102	1721		
	13	14	14	103	77	51	17	28	24	58	86	29	41	60	124	117	41	884		
	14	11	5	60	43	25	17	19	17	49	92	21	18	29	84	69	20	579	19	9888
5 (E)	2	0	3	1	0	1	0	0	0	2	1	0	0	0	1	1	0	10		
	3	3	3	5	1	2	3	2	2	3	2	2	4	6	2	4	1	45		
	4	4	8	4	5	6	12	6	3	2	3	9	7	4	5	3	4	85		
	5	7	13	6	4	8	4	11	1	9	8	15	4	4	5	3	6	108		
	6	7	20	7	7	3	11	6	11	17	8	5	11	5	5	7	7	137		
	7	32	28	19	18	10	28	26	41	28	46	41	21	23	20	22	16	419		
	8	61	78	83	56	72	70	54	79	116	138	128	120	71	62	95	78	1361		
	9	88	63	99	67	50	50	73	91	180	183	173	172	128	115	139	130	1801		
	10	108	65	92	69	59	45	48	52	151	259	228	270	238	236	213	190	2323		
	11	68	40	84	70	48	25	41	52	125	245	288	280	236	267	250	193	2312		
	12	57	63	117	89	48	25	45	58	110	247	267	201	203	401	300	186	2417		
	13	14	29	74	37	15	10	35	28	36	78	46	25	50	143	115	58	793		
	14	11	9	77	27	17	10	16	25	49	34	10	8	21	68	37	19	438	20	12269
6 (F)	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1		
	3	3	2	1	2	4	2	1	2	2	2	1	1	1	1	2	2	29		
	4	1	3	3	4	2	2	2	2	0	2	1	3	3	4	2	0	34		
	5	4	4	2	3	1	0	2	1	2	2	2	1	0	0	2	0	26		
	6	3	6	1	4	3	3	3	3	5	10	2	4	3	3	4	2	59		
	7	12	12	7	6	2	15	4	7	15	13	16	12	8	17	13	4	163		
	8	23	30	14	13	16	15	12	21	31	51	43	44	45	50	50	40	498		
	9	45	16	23	13	7	12	15	35	50	93	67	43	83	70	65	35	672		
	10	45	5	10	13	5	4	9	18	60	117	112	133	167	116	139	82	1035		
	11	32	0	6	6	2	3	1	4	21	70	129	221	168	153	193	133	1142		
	12	1	1	6	3	1	3	0	3	6	12	71	88	66	84	57	81	483		
	13	0	0	1	0	0	0	1	0	1	2	2	1	5	7	4	0	24		
	14	0	0	2	1	0	1	0	0	1	0	0	0	2	6	5	0	18	10	4194
7 (G)	2	0	1	2	0	1	0	1	1	3	1	0	1	0	1	1	0	13		
	3	7	6	2	3	5	6	5	3	3	3	3	4	3	4	4	5	66		
	4	10	6	6	6	7	4	7	4	10	8	8	6	0	4	9	3	98		
	5	5	10	5	4	8	12	8	9	7	8	4	7	4	3	5	9	108		
	6	11	12	11	7	13	12	5	8	11	13	11	8	9	5	11	10	157		
	7	33	31	18	4	12	14	9	23	31	21	19	14	30	21	17	17	314		
	8	80	78	64	29	32	31	35	48	67	82	93	93	95	96	78	61	1062		
	9	71	46	45	30	26	20	38	47	97	125	113	78	113	120	104	84	1157		
	10	95	11	15	18	16	9	18	21	61	101	118	119	206	175	128	114	1225		
	11	51	4	5	2	1	0	3	6	22	38	124	193	182	188	135	156	1110		
	12	15	2	7	0	0	0	0	1	9	5	43	104	74	63	97	66	486		
	13	1	0	3	0	0	0	0	1	1	0	2	2	2	4	0	1	17		
	14	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	35	5849
																				42213

Notes:
(1) Wind Speed Categories defined as follows:

Category	Wind Speed (mph)
1 (Calm)	<0.93
2	>=0.93 to <1.12
3	>=1.12 to <1.68
4	>=1.68 to <2.24
5	>=2.24 to <2.80
6	>=2.80 to <3.36
7	>=3.36 to <4.47
8	>=4.47 to <6.71
9	>=6.71 to <8.95
10	>=8.95 to <11.18
11	>=11.18 to <13.42
12	>=13.42 to <17.90
13	>=17.90 to <22.37
14	>=22.37

Oyster Creek
Joint Frequency Distribution
1995-1999
150 ft wind
150-33 ft Delta T

	Wind Speed Category[1]	Wind Direction Category 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total		
1 (A)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.002369	0	0.002369		
	4	0	0	0	0.002369	0	0	0	0.004738	0.002369	0	0	0	0.002369	0	0	0	0.011845		
	5	0.002368938	0.002369	0	0.002369	0.002369	0.007107	0	0.002369	0.004738	0	0	0	0	0.002369	0.002369	0	0.028427		
	6	0	0.002369	0.004738	0.002369	0	0.004738	0.002369	0.007107	0.002369	0.004738	0.004738	0.004738	0	0.002369	0	0.002369	0.04501		
	7	0.007106815	0.016583	0.014214	0.011845	0.049748	0.037903	0.023689	0.007107	0.004738	0.014214	0.018952	0.009476	0.007107	0.018952	0.016583	0.007107	0.265321		
	8	0.049747708	0.030796	0.063961	0.151612	0.137398	0.135029	0.170564	0.071068	0.073437	0.068699	0.056855	0.056855	0.071068	0.052117	0.078175	0.04501	1.312392		
	9	0.059223462	0.04501	0.042641	0.146874	0.208467	0.279535	0.255845	0.078175	0.087651	0.09002	0.101864	0.118447	0.11134	0.135029	0.151612	0.092389	2.004122		
	10	0.071068154	0.049748	0.120816	0.305593	0.262952	0.270059	0.438254	0.172933	0.106602	0.073437	0.054486	0.127923	0.172933	0.184777	0.196622	0.108971	2.717172		
	11	0.056854523	0.026058	0.135029	0.319807	0.151612	0.075806	0.28901	0.281904	0.198991	0.116078	0.087651	0.191884	0.22268	0.206098	0.262952	0.120816	2.743231		
	12	0.0307962	0.033165	0.196622	0.28901	0.132661	0.026058	0.158719	0.236894	0.51406	0.217942	0.101864	0.217942	0.376661	0.511691	0.644351	0.206098	3.894535		
	13	0.009475754	0.011845	0.075806	0.061592	0.016583	0	0.004738	0.033165	0.194253	0.170564	0.054486	0.075806	0.180039	0.471419	0.412195	0.118447	1.890413		
	14	0	0	0.023689	0.007107	0.007107	0	0	0.004738	0.040272	0.06633	0.028427	0.037903	0.108971	0.255845	0.229787	0.033165	0.843342	0	15.75818
2 (B)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	4	0.002368938	0	0	0.002369	0.002369	0	0.002369	0.002369	0	0	0	0.002369	0	0	0.002369	0	0.016583		
	5	0	0.004738	0.002369	0.004738	0	0	0	0.002369	0	0.002369	0	0	0.002369	0	0	0.002369	0.02132		
	6	0.007106815	0	0.002369	0.007107	0.002369	0.007107	0.004738	0	0.004738	0.002369	0.004738	0.004738	0.002369	0	0.002369	0.002369	0.054486		
	7	0.007106815	0.011845	0.007107	0.016583	0.023689	0.023689	0.011845	0.002369	0.016583	0.004738	0.004738	0.011845	0.007107	0.002369	0.018952	0.004738	0.175301		
	8	0.037903016	0.04501	0.030796	0.049748	0.075806	0.026058	0.075806	0.052117	0.042641	0.052117	0.042641	0.049748	0.06633	0.047379	0.037903	0.02132	0.753322		
	9	0.040271954	0.026058	0.042641	0.061592	0.06633	0.06633	0.073437	0.063961	0.040272	0.049748	0.040272	0.063961	0.054486	0.061592	0.09002	0.056855	0.897828		
	10	0.037903016	0.014214	0.052117	0.078175	0.052117	0.033165	0.071068	0.137398	0.080544	0.037903	0.018952	0.06633	0.082913	0.078175	0.092389	0.047379	0.980741		
	11	0.009475754	0.011845	0.035534	0.037903	0.018952	0.016583	0.042641	0.059223	0.085282	0.030796	0.026058	0.056855	0.108971	0.099495	0.078175	0.061592	0.779381		
	12	0.009475754	0.002369	0.04501	0.04501	0.023689	0.023689	0.016583	0.040272	0.092389	0.082913	0.018952	0.06633	0.097126	0.106602	0.116078	0.068699	0.855187		
	13	0	0.004738	0.014214	0.014214	0.009476	0	0.004738	0.004738	0.063961	0.04501	0.018952	0.028427	0.047379	0.101864	0.092389	0.023689	0.473788		
	14	0	0	0.007107	0	0.002369	0	0.002369	0.002369	0.007107	0.014214	0.011845	0.014214	0.02132	0.087651	0.052117	0.014214	0.236894	0	5.24483
3 (C)	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	3	0	0	0	0	0.002369	0	0	0	0	0	0	0	0	0	0	0	0.002369		
	4	0.002368938	0.002369	0.002369	0	0	0.002369	0	0.002369	0.002369	0	0	0	0	0	0	0	0.014214		
	5	0	0	0.002369	0	0	0.004738	0.002369	0.002369	0	0	0	0	0.002369	0.002369	0	0	0.016583		
	6	0.002368938	0.004738	0.004738	0.004738	0	0.002369	0	0.002369	0	0.007107	0.007107	0.007107	0	0	0.002369	0.007107	0.052117		
	7	0.011844692	0.014214	0.014214	0.002369	0.009476	0.014214	0.009476	0.009476	0.009476	0.004738	0	0.002369	0.004738	0.007107	0.004738	0.004738	0.123185		
	8	0.026058323	0.026058	0.030796	0.028427	0.04501	0.033165	0.040272	0.014214	0.028427	0.014214	0.030796	0.028427	0.037903	0.033165	0.037903	0.028427	0.483263		
	9	0.037903016	0.018952	0.016583	0.011845	0.026058	0.023689	0.042641	0.030796	0.028427	0.02132	0.014214	0.023689	0.047379	0.026058	0.047379	0.035534	0.452467		
	10	0.011844692	0.009476	0.028427	0.040272	0.02132	0.011845	0.035534	0.059223	0.04501	0.009476	0.004738	0.011845	0.028427	0.047379	0.040272	0.018952	0.42404		
	11	0.009475754	0.007107	0.02132	0.016583	0.009476	0.004738	0.035534	0.026058	0.049748	0.033165	0.016583	0.026058	0.04501	0.040272	0.035534	0.02132	0.397982		
	12	0.009475754	0.002369	0.018952	0.02132	0.014214	0.002369	0.004738	0.007107	0.061592	0.063961	0.009476	0.033165	0.030796	0.052117	0.054486	0.02132	0.407457		
	13	0.002368938	0	0.009476	0.009476	0.004738	0	0.002369	0.004738	0.014214	0.02132	0.007107	0.011845	0.018952	0.047379	0.028427	0.014214	0.196622		
	14	0	0	0	0	0	0	0.002369	0	0.002369	0.009476	0.009476	0.004738	0.026058	0.04501	0.042641	0.004738	0.146874	0	2.717172
4 (D)	2	0.002368938	0.004738	0.007107	0	0	0.002369	0	0	0.004738	0	0	0	0.002369	0	0.002369	0	0.026058		
	3	0.011844692	0.007107	0.011845	0.004738	0.009476	0.007107	0.004738	0.007107	0.004738	0.009476	0.009476	0.004738	0.004738	0.004738	0.004738	0.004738	0.11134		
	4	0.016582569	0.016583	0.02132	0.009476	0.014214	0.009476	0.018952	0.007107	0.007107	0.007107	0.011845	0.011845	0.011845	0.007107	0.016583	0.02132	0.208467		
	5	0.021320446	0.033165	0.011845	0.014214	0.018952	0.011845	0.016583	0.016583	0.030796	0.007107	0.009476	0.007107	0.016583	0.004738	0.014214	0.009476	0.244001		
	6	0.0307962	0.037903	0.033165	0.030796	0.026058	0.028427	0.033165	0.033165	0.028427	0.030796	0.026058	0.018952	0.023689	0.016583	0.026058	0.026058	0.450098		
	7	0.063961339	0.075806	0.087651	0.047379	0.075806	0.071068	0.108971	0.085282	0.068699	0.035534	0.080544	0.040272	0.073437	0.068699	0.063961	0.073437	1.120508		
	8	0.18714614	0.220311	0.22268	0.196622	0.227418	0.194253	0.232156	0.277166	0.229787	0.220311	0.127923	0.132661	0.163457	0.198991	0.217942	0.281904	3.330728		
	9	0.27953474	0.198991	0.260583	0.225049	0.213204	0.120816	0.239263	0.336389	0.360079	0.241632	0.139767	0.189515	0.189515	0.187146	0.277166	0.258214	3.716864		
	10	0.229787032	0.163457	0.258214	0.206098	0.170564	0.142136	0.210836	0.225049	0.338758	0.24637	0.139767	0.161088	0.24637	0.236894	0.265321	0.291379	3.532087		
	11	0.137398432	0.142136	0.277166	0.206098	0.127923	0.151612	0.113709	0.127923	0.270059	0.253476	0.123185	0.175301	0.227418	0.253476	0.291379	0.217942	3.096203		
	12	0.101864355	0.144505	0.405088	0.419302	0.227418	0.101864	0.099495	0.082913	0.286642	0.464312	0.113029	0.220311	0.315069	0.42404	0.407457	0.241632	4.076943		
	13	0.033165139	0.033165	0.244001	0.182408	0.120816	0.040272	0.06633	0.056855	0.137398	0.203729	0.068699	0.097126	0.142136	0.293748	0.277166	0.097126	2.094142		
	14	0.026058323	0.011845	0.142136	0.101864	0.059223	0.040272	0.04501	0.040272	0.116078	0.217942	0.049748	0.042641	0.068699	0.198991	0.163457	0.047379	1.371615	0.04501	23.42406
5 (E)	2	0	0.007107	0.002369	0	0.002369	0	0	0	0.004738	0.002369	0	0	0	0.002369	0.002369	0	0.023689		
	3	0.007106815	0.007107	0.011845	0.002369	0.004738	0.007107	0.004738	0.004738	0.007107	0.004738	0.004738	0.009476	0.014214	0.004738	0.009476	0.002369	0.106602		
	4	0.009475754	0.018952	0.009476	0.011845	0.014214	0.028427	0.014214	0.007107	0.004738	0.007107	0.02132	0.016583	0.009476	0.011845	0.007107	0.009476	0.20136		
	5	0.016582569	0.030796	0.014214	0.009476	0.018952	0.009476	0.026058	0.002369	0.02132	0.018952	0.035534	0.009476	0.009476	0.011845	0.007107	0.014214	0.255845		
	6	0.016582569	0.047379	0.016583	0.016583	0.007107	0.026058	0.014214	0.026058	0.040272	0.018952	0.011845	0.026058	0.011845	0.011845	0.016583	0.016583	0.324545		
	7	0.075806031	0.06633	0.04501	0.042641	0.023689	0.06633	0.061592	0.097126	0.06633	0.108971	0.097126	0.049748	0.054486	0.047379	0.052117	0.037903	0.992585		
	8	0.144505247	0.184777	0.196622	0.132661	0.170564	0.165826	0.127923	0.187146	0.274797	0.326914	0.303224	0.284273	0.168195	0.146874	0.225049	0.184777	3.224125		
	9	0.208466586	0.149243	0.234525	0.158719	0.118447	0.118447	0.172933	0.215573	0.426409	0.433516	0.409826	0.407457	0.303224	0.272428	0.329282	0.307962	4.266458		
	10	0.255845356	0.153981	0.217942	0.163457	0.139767	0.106602	0.113709	0.123185	0.35771	0.613555	0.540118	0.639613	0.563807	0.559069	0.504584	0.450098	5.503044		
	11	0.161087817	0.094758	0.198991	0.165826	0.113709	0.059223	0.097126	0.123185	0.296117	0.58039	0.682254	0.663303	0.559069	0.632507	0.592235	0.457205	5.476986		
	12	0.135029493	0.149243	0.277166	0.210836	0.113709	0.059223	0.106602	0.137398	0.260583	0.585128	0.632507	0.476157	0.480895	0.949944	0.710682	0.440623	5.725724		
	13	0.033165139	0.068699	0.175301	0.087651	0.035534	0.023689	0.082913	0.06633	0.085282	0.184777	0.108971	0.059223	0.118447	0.338758	0.272428	0.137398	1.878568		
	14	0.026058323	0.02132	0.182408	0.063961	0.040272	0.023689	0.037903	0.059223	0.116078	0.080544	0.023689	0.018952	0.049748	0.161088	0.087651	0.04501	1.037595	0.047379	29.06451
6 (F)	2	0	0	0	0	0	0	0	0	0	0	0	0	0.002369	0	0	0	0.002369		
	3	0.007106815	0.004738	0.002369	0.004738	0.009476	0.004738	0.002369	0.004738	0.004738	0.004738	0.002369	0.002369	0.002369	0.002369	0.004738	0.004738	0.068699		
	4	0.002368938	0.007107	0.007107	0.009476	0.004738	0.004738	0.004738	0.004738	0	0.004738	0.002369	0.007107	0.007107	0.009476	0.004738	0	0.080544		
	5	0.009475754	0.009476	0.004738	0.007107	0.002369	0	0.004738	0.002369	0.004738	0.004738	0.004738	0.002369	0	0	0.004738	0	0.061592		
	6	0.007106815	0.014214	0.002369	0.009476	0.007107	0.007107	0.007107	0.007107	0.011845	0.023689	0.004738	0.009476	0.007107	0.007107	0.009476	0.004738	0.139767		
	7	0.028427262	0.028427	0.016583	0.014214	0.004738	0.035534	0.009476	0.016583	0.035534	0.030796	0.037903	0.028427	0.018952	0.040272	0.030796	0.009476	0.386137		
	8	0.054485585	0.071068	0.033165	0.030796	0.037903	0.035534	0.028427	0.049748	0.073437	0.120816	0.101864	0.104233	0.106602	0.118447	0.118447	0.094758	1.179731		
	9	0.106602232	0.037903	0.054486	0.030796	0.016583	0.028427	0.035534	0.082913	0.118447	0.220311	0.158719	0.101864	0.196622	0.165826	0.153981	0.082913	1.591927		
	10	0.106602232	0.011845	0.023689	0.030796	0.011845	0.009476	0.02132	0.042641	0.142136	0.277166	0.265321	0.315069	0.395613	0.274797	0.329282	0.194253	2.451851		
	11	0.075806031	0	0.014214	0.014214	0.004738	0.007107	0.002369	0.009476	0.049748	0.165826	0.305593	0.523535	0.397982	0.362448	0.457205	0.315069	2.705328		
	12	0.002368938	0.002369	0.014214	0.007107	0.002369	0.007107	0	0.007107	0.014214	0.028427	0.168195	0.208467	0.15635	0.198991	0.135029	0.191884	1.144197		
	13	0	0	0.002369	0	0	0	0.002369	0	0.002369	0.004738	0.004738	0.002369	0.011845	0.016583	0.009476	0	0.056855		
	14	0	0	0.004738	0.002369	0	0.002369	0	0	0.002369	0	0	0	0.004738	0.014214	0.011845	0	0.042641	0.023689	9.935328
7 (G)	2	0	0.002369	0.004738	0	0.002369	0	0.002369	0.002369	0.007107	0.002369	0	0.002369	0	0.002369	0.002369	0	0.030796		
	3	0.016582569	0.014214	0.004738	0.007107	0.011845	0.014214	0.011845	0.007107	0.007107	0.007107	0.007107	0.009476	0.007107	0.009476	0.009476	0.011845	0.15635		
	4	0.023689385	0.014214	0.014214	0.014214	0.016583	0.009476	0.016583	0.009476	0.023689	0.018952	0.018952	0.014214	0	0.009476	0.02132	0.007107	0.232156		
	5	0.011844692	0.023689	0.011845	0.009476	0.018952	0.028427	0.018952	0.02132	0.016583	0.018952	0.009476	0.016583	0.009476	0.007107	0.011845	0.02132	0.255845		
	6	0.026058323	0.028427	0.026058	0.016583	0.030796	0.028427	0.011845	0.018952	0.026058	0.030796	0.026058	0.018952	0.02132	0.011845	0.026058	0.023689	0.371923		
	7	0.07817497	0.073437	0.042641	0.009476	0.028427	0.033165	0.02132	0.054486	0.073437	0.049748	0.04501	0.033165	0.071068	0.049748	0.040272	0.040272	0.743847		
	8	0.189515078	0.184777	0.151612	0.068699	0.075806	0.073437	0.082913	0.113709	0.158719	0.194253	0.220311	0.220311	0.225049	0.227418	0.184777	0.144505	2.515813		
	9	0.168194632	0.118447	0.106602	0.071068	0.061592	0.047379	0.09002	0.11134	0.229787	0.296117	0.26769	0.184777	0.26769	0.284273	0.24637	0.198991	2.740862		
	10	0.225049155	0.026058	0.035534	0.042641	0.037903	0.02132	0.042641	0.049748	0.144505	0.239263	0.279535	0.281904	0.488001	0.414564	0.303224	0.270059	2.90195		
	11	0.120815862	0.009476	0.011845	0.004738	0.002369	0	0.007107	0.014214	0.052117	0.09002	0.293748	0.457205	0.431147	0.44536	0.319807	0.369554	2.629522		
	12	0.035534077	0.004738	0.016583	0	0	0	0	0.002369	0.02132	0.011845	0.101864	0.24637	0.175301	0.149243	0.229787	0.15635	1.151304		
	13	0.002368938	0	0.007107	0	0	0	0	0.002369	0.002369	0	0.004738	0.004738	0.004738	0.009476	0	0.002369	0.040272		
	14	0	0	0	0	0	0	0	0	0	0	0	0	0.002369	0	0	0	0.002369	0.082913	13.85592
																		99.80101		100

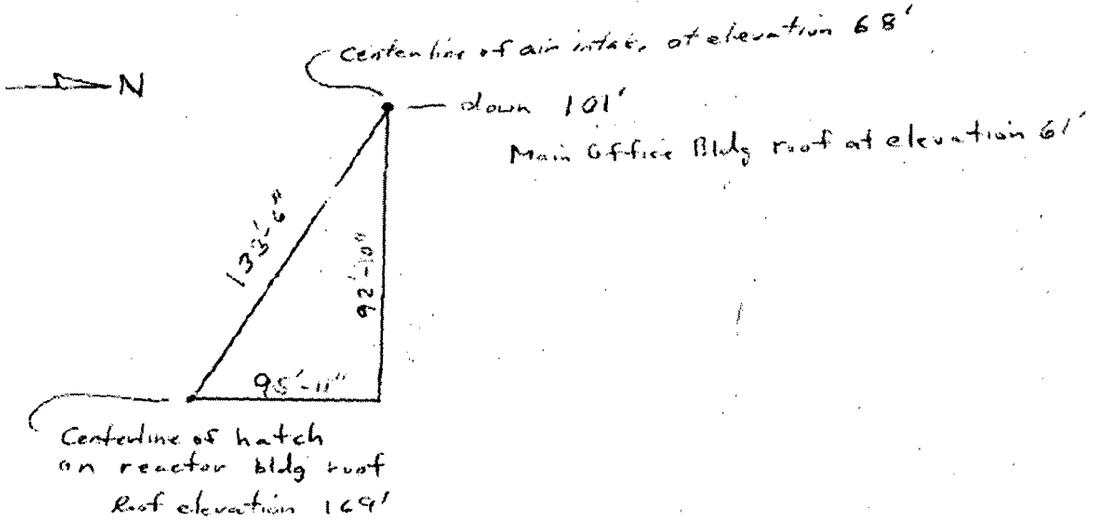
All Stability Classes	2	0.002368938	0.014214	0.014214	0	0.004738	0.002369	0.002369	0.002369	0.016583	0.004738	0	0.002369	0.004738	0.004738	0.007107	0	0.082913
	3	0.251107479	0.04501	0.061592	0.054486	0.063961	0.040272	0.054486	0.06633	0.161088	0.258214	0.296117	0.298486	0.509322	0.426409	0.324545	0.281904	3.193329
	4	0.376661218	0.172933	0.431147	0.563807	0.315069	0.170564	0.495108	0.516429	0.689361	0.862294	1.120508	1.414256	1.385829	1.440315	1.310023	1.051809	12.31611
	5	0.324544572	0.338758	0.973634	0.992585	0.51406	0.220311	0.386137	0.51406	1.2508	1.454528	1.167887	1.468742	1.632199	2.392628	2.29787	1.326606	17.25535
	6	0.080543908	0.118447	0.528273	0.355341	0.187146	0.063961	0.163457	0.168195	0.499846	0.630138	0.26769	0.279535	0.523535	1.279227	1.092081	0.393244	6.630659
	7	0.052116647	0.033165	0.360079	0.175301	0.108971	0.06633	0.087651	0.106602	0.284273	0.388506	0.123185	0.118447	0.281904	0.762798	0.587497	0.144505	3.68133

Notes:
(1) Wind Speed Categories defined as follows:

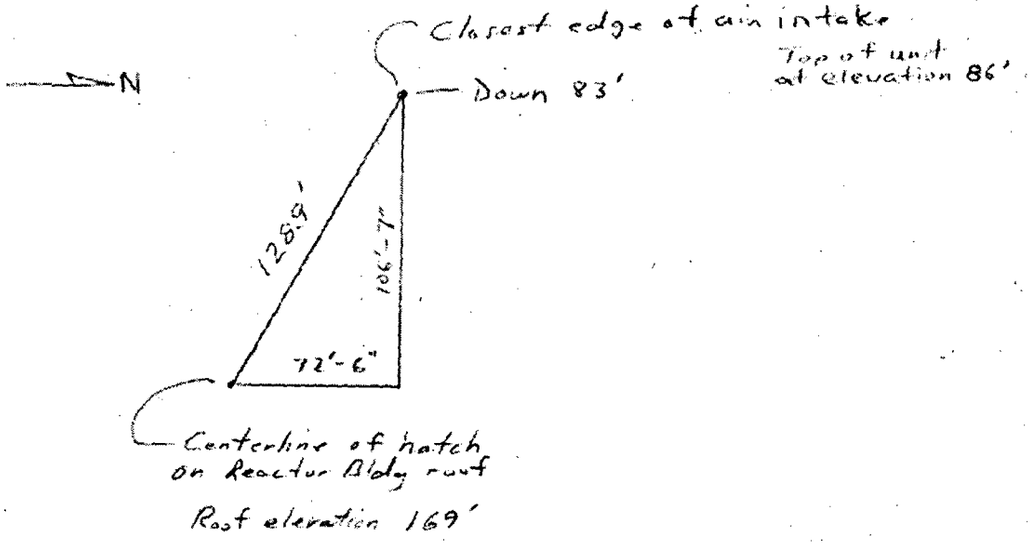
Category	Wind Speed (mph)
1 (Calm)	<0.93
2	>=0.93 to <1.12
3	>=1.12 to <1.68
4	>=1.68 to <2.24
5	>=2.24 to <2.80
6	>=2.80 to <3.36
7	>=3.36 to <4.47
8	>=4.47 to <6.71
9	>=6.71 to <8.95
10	>=8.95 to <11.18
11	>=11.18 to <13.42
12	>=13.42 to <17.90
13	>=17.90 to <22.37
14	>=22.37

Item 1

"A" Control Rm HVAC

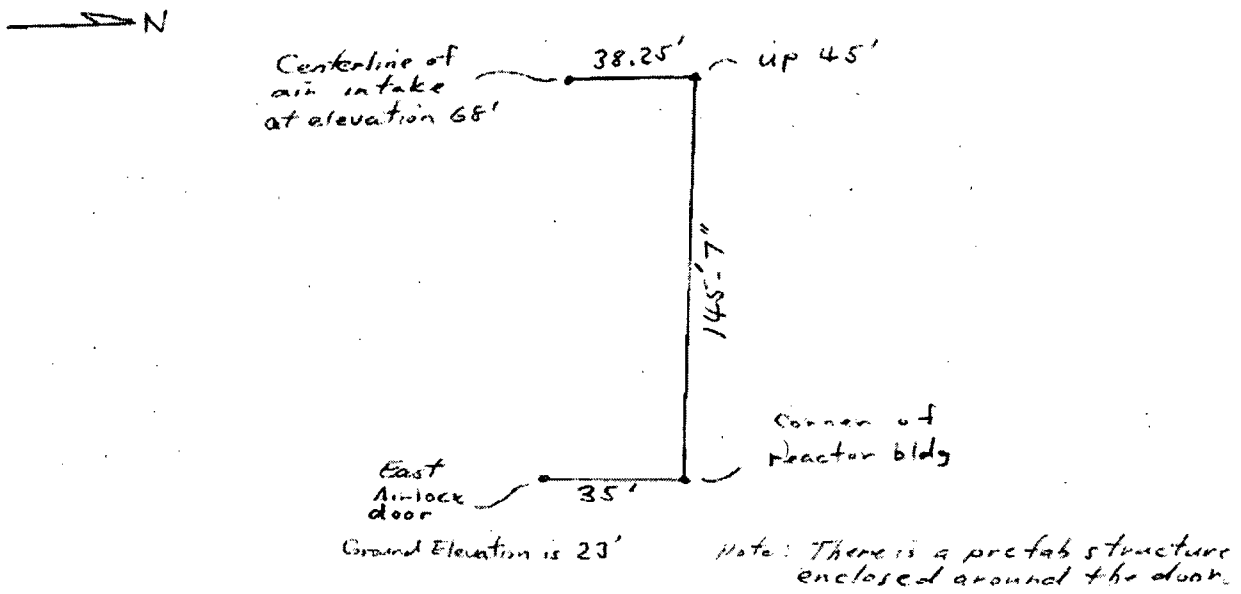


"B" Control Rm HVAC

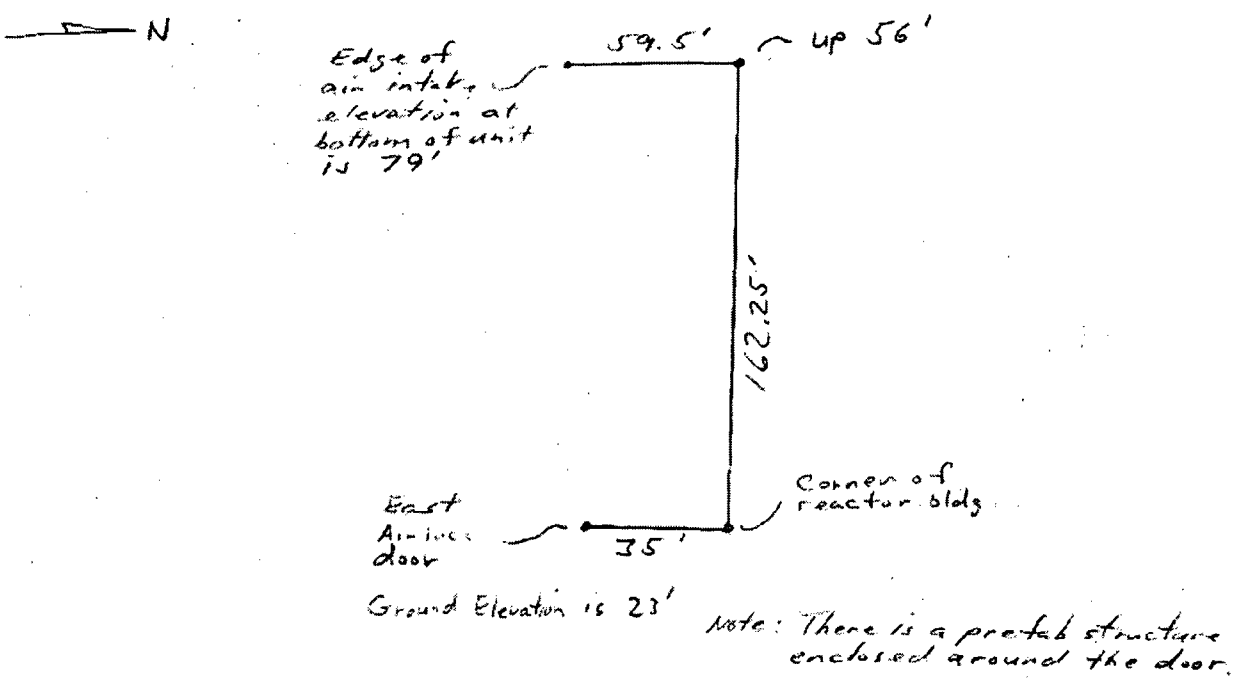


Item 6A

"A" Control Room HVAC

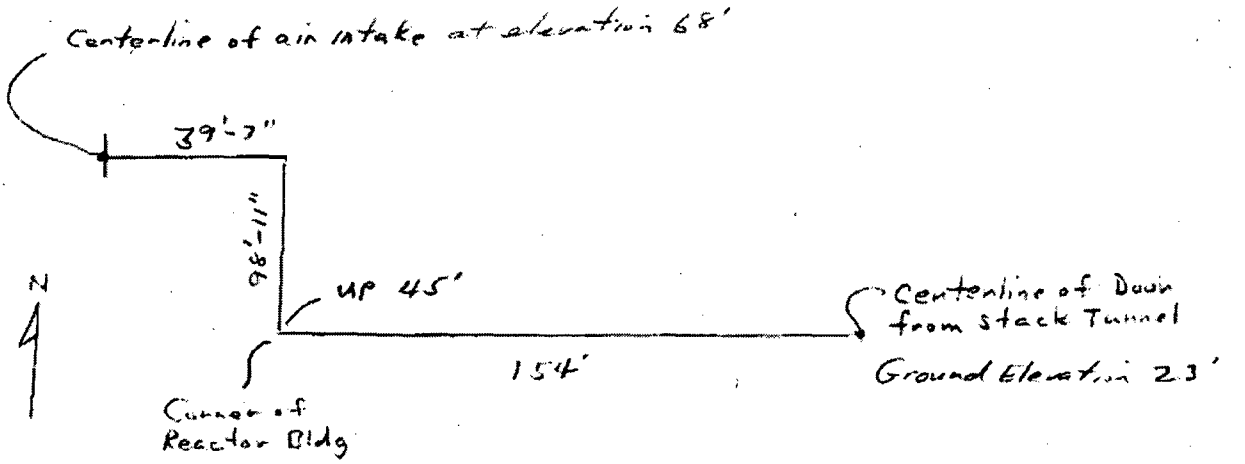


"B" Control Room HVAC

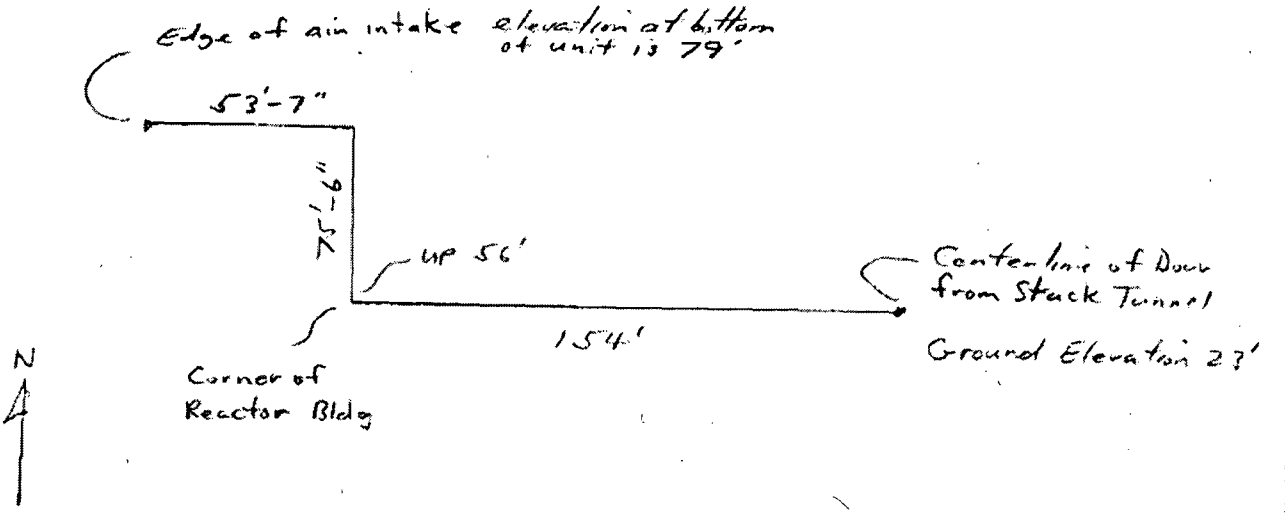


Item 5

"A" Control Room HVAC

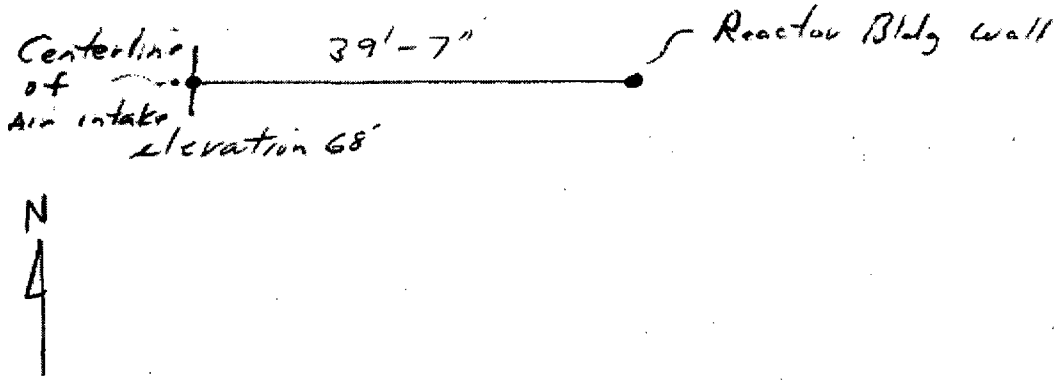


"B" Control Room HVAC

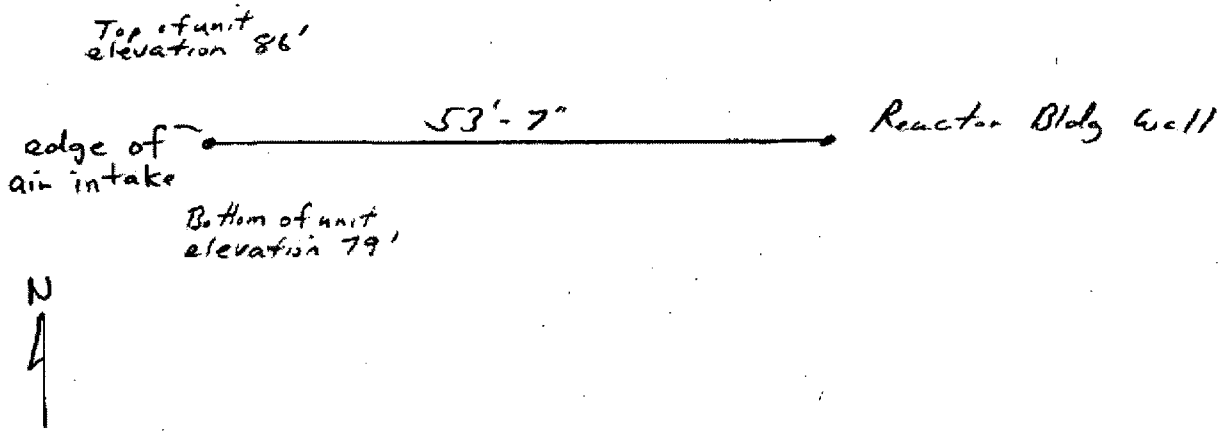


Item 9

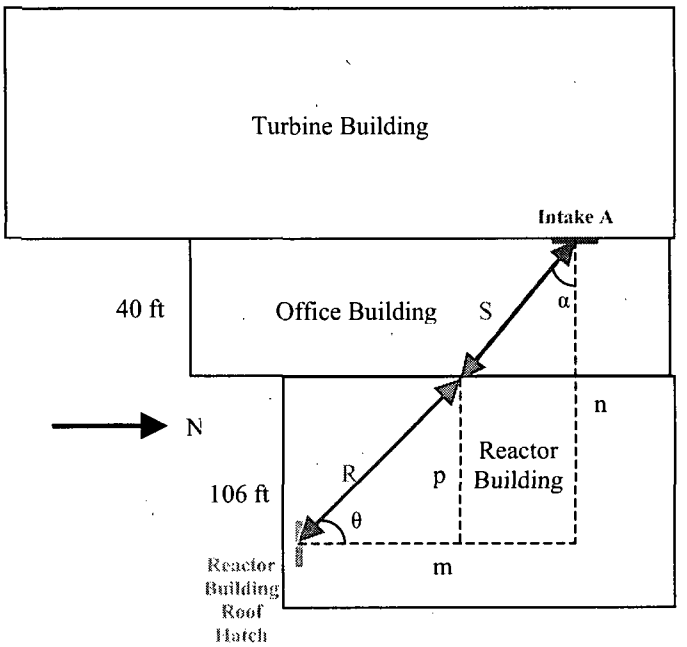
"A" Control Room HVAC



"B" Control Room HVAC



Calculation of Taut String Length
Reactor Building Roof Hatch to Control Room HVAC Intake A



R = Horizontal distance from the Reactor Building Roof Hatch to the edge of the Reactor Building in the direction of Intake A

S = Slant distance from the edge of the top of the Reactor Building to Intake A

m = plant north-south horizontal distance from the Roof Hatch to Intake A = 95.9 ft (Sketches from John Yuen, Item 1)

n = plant east-west horizontal distance from the Roof Hatch to Intake A = 92.8 ft (Sketches from John Yuen, Item 1)

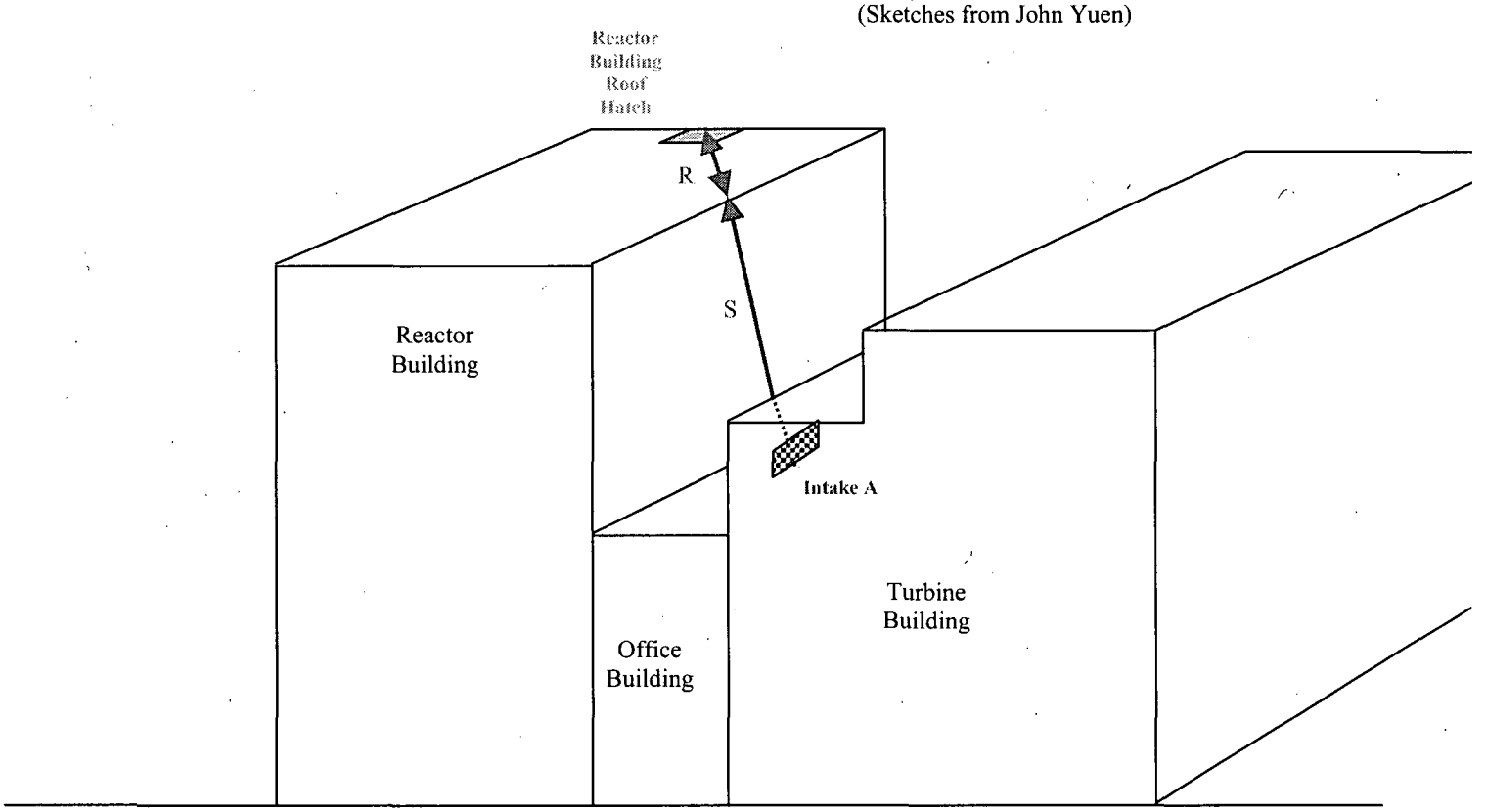
α = 45.8° (Calculated based on sketches by John Yuen)

Plant east-west horizontal distance from and normal to the edge of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 9)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

Reactor Building Width = 106 ft (from Drawing 3E-153-02-007)

Reactor Building roof height = 146 ft above grade (Sketches from John Yuen)



Calculation of Taut String Length
Reactor Building Roof Hatch to Control Room HVAC Intake A

R = Horizontal distance from the Reactor Building Roof Hatch to the edge of the Reactor Building = 75.7 ft, calculated as follows:

$\theta = 180° - (90° + \alpha)$
$= 180° - (90° + 45.8°)$
$= 180° - (135.8°)$
$= 44.2°$

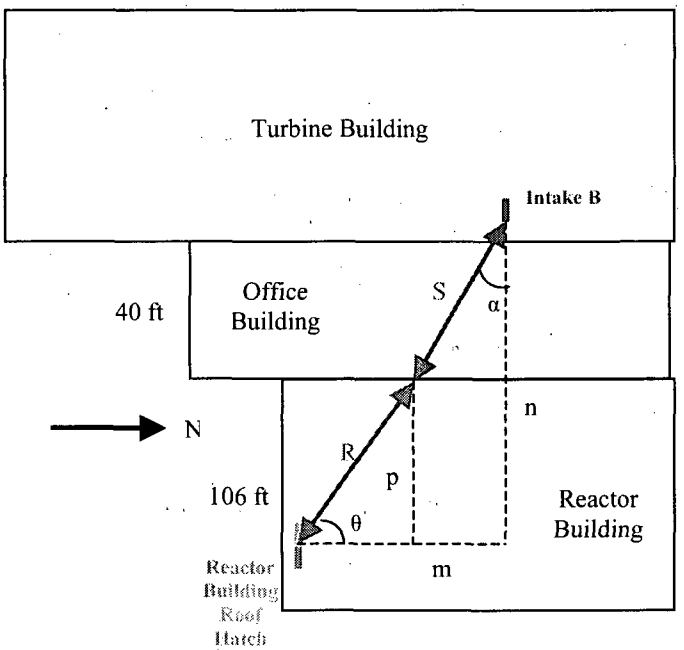
$\sin\theta = p / R$; p = n – Horizontal distance from and normal to the edge of the Reactor Building to Intake A
$\sin(44.2°) = (92.8 - 39.6) / R$
$0.6972 = 53.2 / R$
$R = 53.2 / 0.6972$
$= 76.3$ ft

S = Slant distance from the top of the Reactor Building to Intake A = 116.1 ft, calculated as follows:

$$S = \sqrt{(\text{Horizontal distance from Reactor Building Roof Hatch to Intake A - R})^2 + (\text{Reactor Building roof height - Intake A height})^2}$$
$$= \sqrt{(133.5 - 76.3)^2 + (146 - 45)^2}$$
$$= \sqrt{(57.2)^2 + (101)^2}$$
$$= \sqrt{13473}$$
$$= 116.1\,\text{ft}$$

Total Taut String Length = R + S = 76.3 + 116.1 = **192.4 ft = 58.6 m**

Calculation of Taut String Length
Reactor Building Roof Hatch to Control Room HVAC Intake B



R = Horizontal distance from the Reactor Building Roof Hatch to the edge of the Reactor Building in the direction of Intake B

S = Slant distance from the edge of the top of the Reactor Building to Intake B

m = plant north-south horizontal distance from the Roof Hatch to Intake B = 72.5 ft (Sketches from John Yuen, Item 1)

n = plant east-west horizontal distance from the Roof Hatch to Intake B = 106.6 ft (Sketches from John Yuen, Item 1)

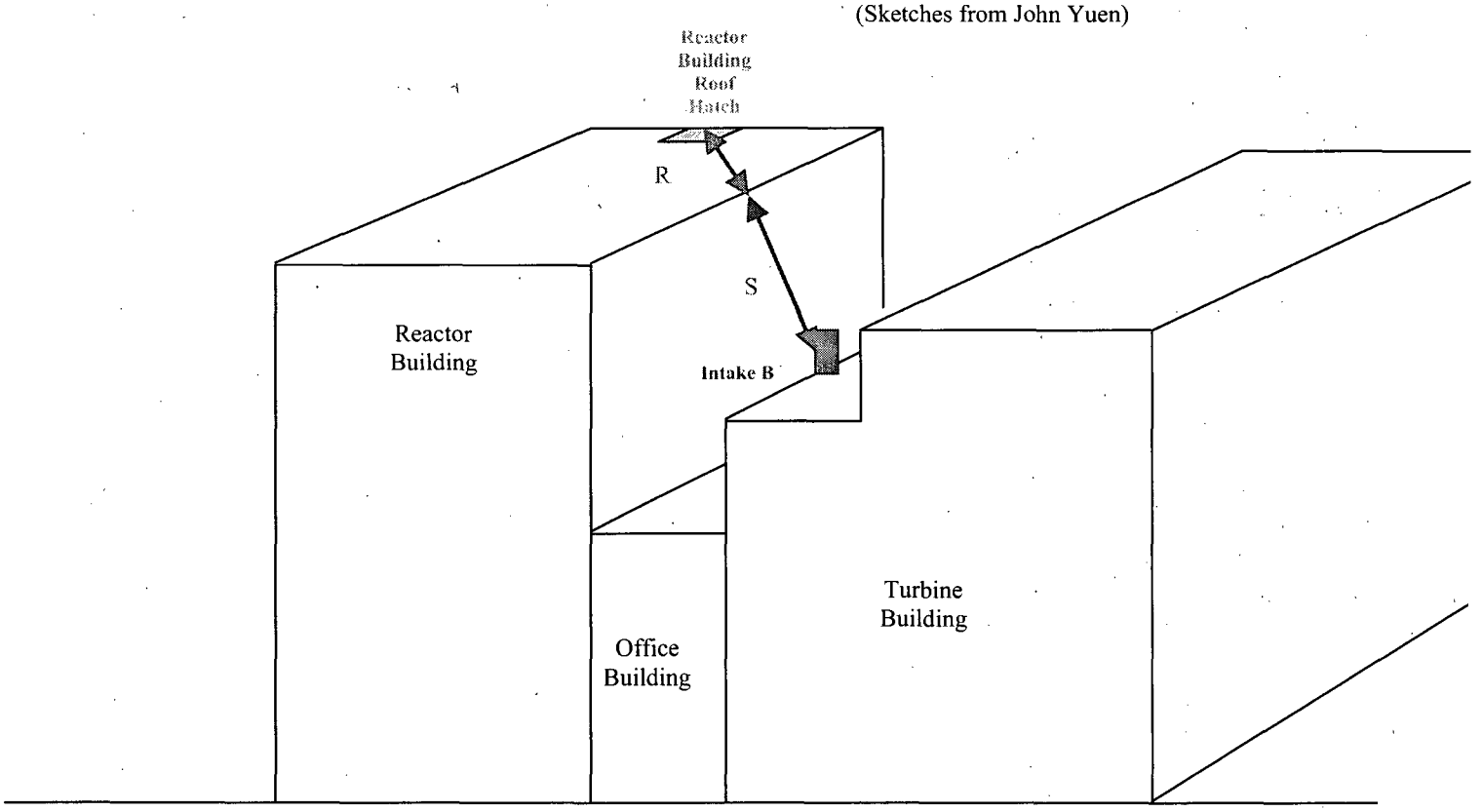
α = 34.2° (Calculated based on sketches by John Yuen)

Plant east-west horizontal distance from and normal to the edge of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 9)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Reactor Building Width = 106 ft (from Drawing 3E-153-02-007)

Reactor Building roof height = 146 ft above grade (Sketches from John Yuen)



Calculation of Taut String Length
Reactor Building Roof Hatch to Control Room HVAC Intake B

R = Horizontal distance from the Reactor Building Roof Hatch to the edge of the Reactor Building = 64.1 ft, calculated as follows:

$\theta = 180° - (90° + \alpha)$;
$= 180° - (90° + 34.2°)$
$= 180° - (124.2°)$
$= 55.8°$

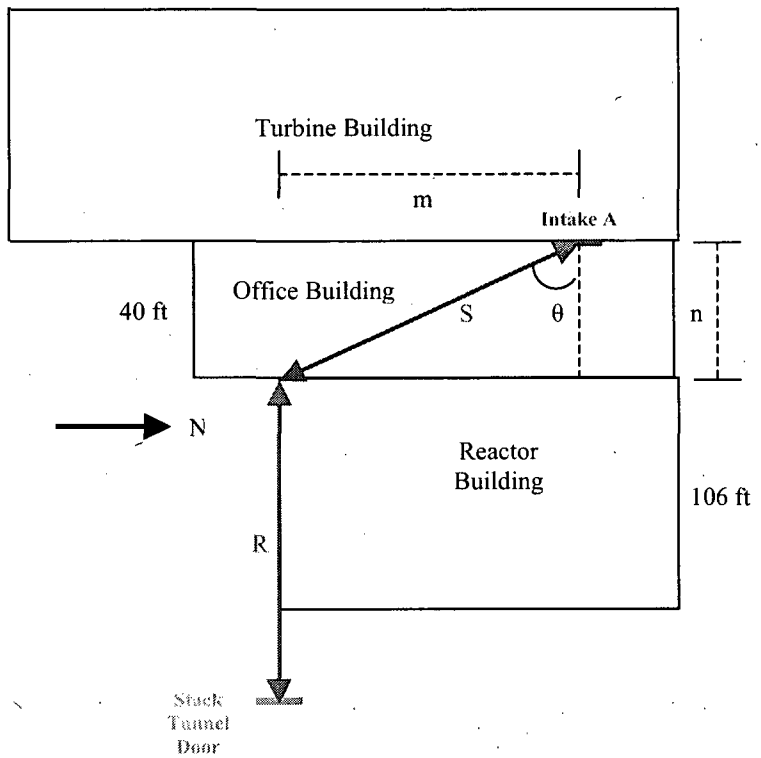
$\sin\theta = p / R$; p = n – Horizontal distance from and normal to the edge of the Reactor Building to Intake B
$\sin(55.8°) = (106.6 - 53.6) / R$
$0.8271 = 53 / R$
$R = 53 / 0.8271$
$= 64.1$ ft

S = Slant distance from the top of the Reactor Building to Intake B = 108.1 ft, calculated as follows:

$$S = \sqrt{(\text{Horizontal distance from Reactor Building Roof Hatch to Intake B} - R)^2 + (\text{Reactor Building roof height} - \text{Intake B height})^2}$$
$$= \sqrt{(128.9 - 64.1)^2 + (146 - 59.5)^2}$$
$$= \sqrt{(64.8)^2 + (86.5)^2}$$
$$= \sqrt{11681}$$
$$= 108.1\,\text{ft}$$

Total Taut String Length = R + S = 64.1 + 108.1 = **172.2 ft = 52.5 m**

Calculation of Taut String Length
Stack Tunnel Door to Control Room HVAC Intake A



R = Slant distance from the Stack Tunnel Door to the southwest corner of the Reactor Building

S = Slant distance from the southwest corner of the Reactor Building to Intake A

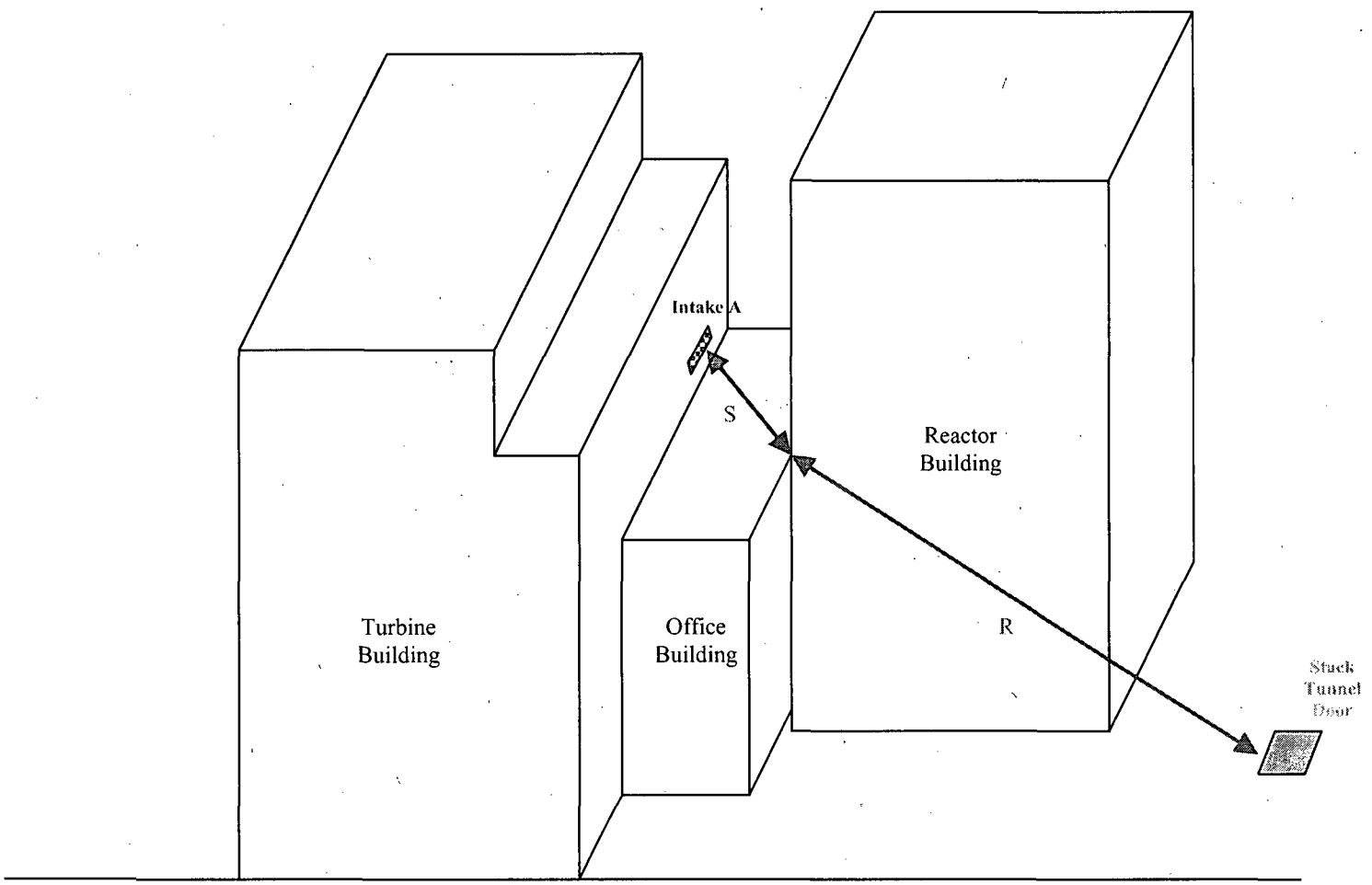
m = plant north-south horizontal distance from the south wall of the Reactor Building to Intake A = 98.9 ft (Sketches from John Yuen, Item 5)

n = plant east-west horizontal distance from the west wall of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 5)

Plant east-west horizontal distance from the Stack Tunnel Door to the southwest corner of the Reactor Building = 154 ft (Sketches from John Yuen, Item 5)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen, Item 5)

Office Building roof height = 38 ft above grade (Sketches from JohnYuen, Item 1)



Calculation of Taut String Length
Stack Tunnel Door to Control Room HVAC Intake A

R = Slant distance from the Stack Tunnel Door to the Top of the Office Building = 158.6 ft, calculated as follows:

$$R = \sqrt{(\text{Horizontal distance from the Stack Tunnel Door to the southwest edge of the Reactor Building})^2 + (\text{Office Building roof height})^2}$$
$$= \sqrt{(154)^2 + (38)^2}$$
$$= \sqrt{25160}$$
$$= 158.6 \text{ ft}$$

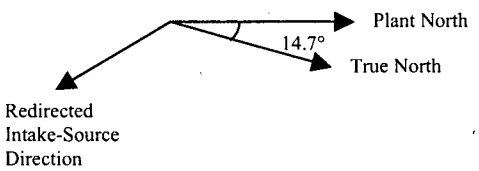
S = Slant distance from the corner of the Reactor Building (at the Office Building height) to Intake A = 106.7 ft, calculated as follows:

$$S = \sqrt{\left(\sqrt{(m)^2 + (n)^2}\right)^2 + (\text{Height of Intake A - Office Building roof height})^2}$$
$$= \sqrt{\left(\sqrt{(98.9)^2 + (39.6)^2}\right)^2 + (45 - 38)^2}$$
$$= \sqrt{\left(\sqrt{11349}\right)^2 + 7^2}$$
$$= \sqrt{(106.5)^2 + 7^2}$$
$$= \sqrt{11391}$$
$$= 106.7 \text{ ft}$$

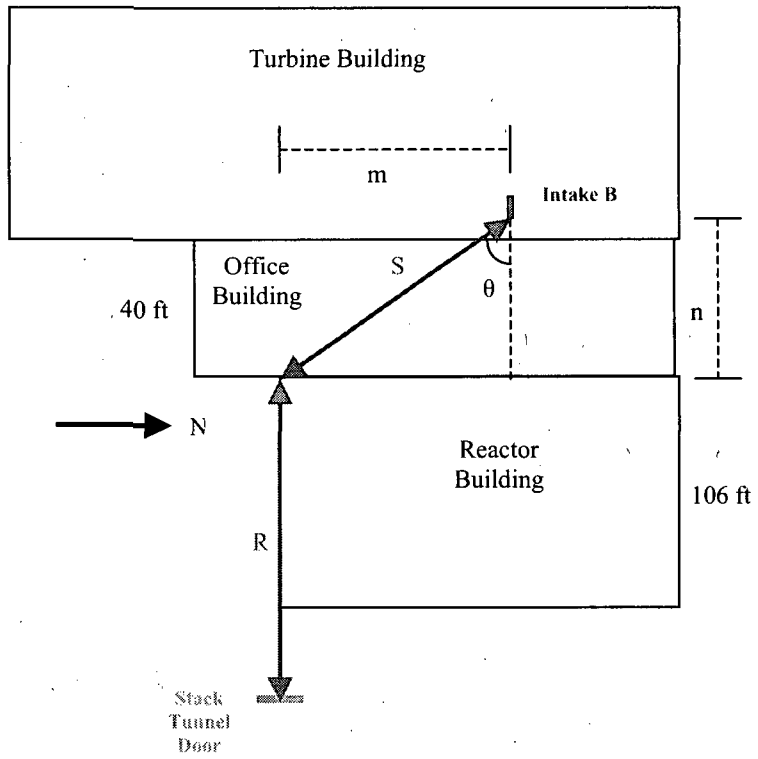
Total Taut String Length = R + S = 158.6 + 106.7 = **265.3 ft = 80.9 m**

Redirected Direction from Intake A to the Southwest Corner of the Reactor Building = 144° from true north

$$\tan\theta = \frac{m}{n} = \frac{98.9}{39.6} = 2.4975$$
$$\theta = 68.2°$$
$$90° + 68.2° = 158.2° \textit{ from plant north}$$
$$158.2° - 14.7° = 143.5° \textit{ from true north}$$



Calculation of Taut String Length
Stack Tunnel Door to Control Room HVAC Intake B



R = Slant distance from the Stack Tunnel Door to the southwest corner of the Reactor Building

S = Slant distance from the southwest corner of the Reactor Building to Intake B

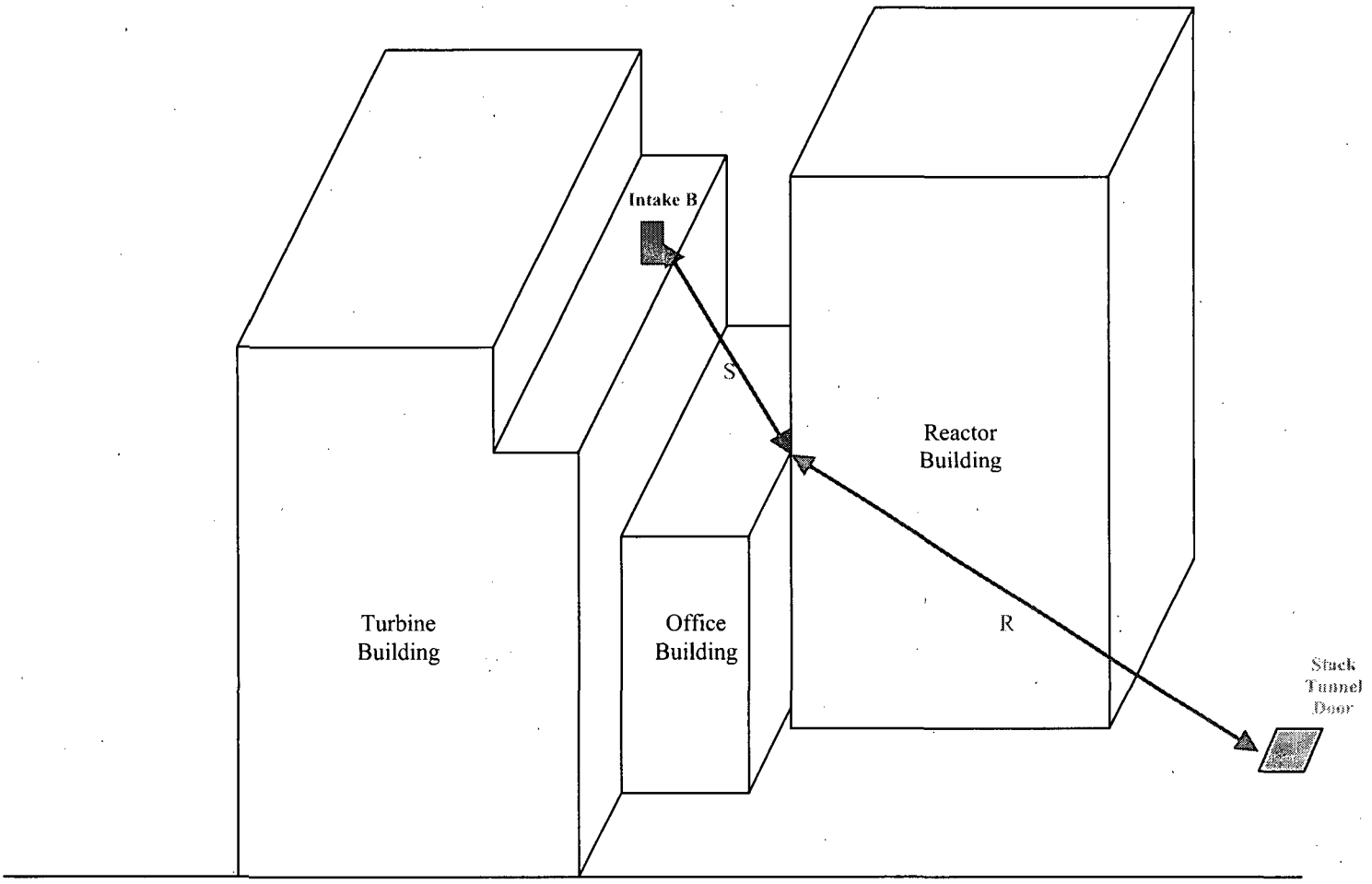
m = plant north-south horizontal distance from the south wall of the Reactor Building to Intake B = 75.5 ft (Sketches from John Yuen, Item 5)

n = east-west horizontal distance from the west wall of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 5)

Plant east-west distance from the Stack Tunnel Door to the southwest corner of the Reactor Building = 154 ft (Sketches from John Yuen, Item 5)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Office Building roof height = 38 ft above grade (Sketches from JohnYuen, Item 1)



Calculation of Taut String Length
Stack Tunnel Door to Control Room HVAC Intake B

R = Slant distance from the Stack Tunnel Door to the top of the Office Building = 158.6 ft, calculated as follows:

$$R = \sqrt{(\text{Horizontal distance from the Stack Tunnel Door to the southwest corner of the Reactor Building})^2 + (\text{Office Building roof height})^2}$$
$$= \sqrt{(154)^2 + (38)^2}$$
$$= \sqrt{25160}$$
$$= 158.6 \text{ ft}$$

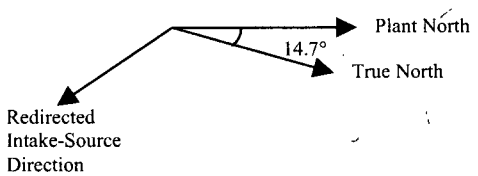
S = Slant distance from the southwest corner of the Reactor Building (at the Office Building height) to Intake B = 95.1 ft, calculated as follows:

$$S = \sqrt{\left(\sqrt{(m)^2 + (n)^2}\right)^2 + (\text{Height of Intake B - Office Building roof height})^2}$$
$$= \sqrt{\left(\sqrt{(75.5)^2 + (53.6)^2}\right)^2 + (59.5 - 38)^2}$$
$$= \sqrt{\left(\sqrt{8573}\right)^2 + 21.5^2}$$
$$= \sqrt{(92.6)^2 + 21.5^2}$$
$$= \sqrt{9037}$$
$$= 95.1 \text{ ft}$$

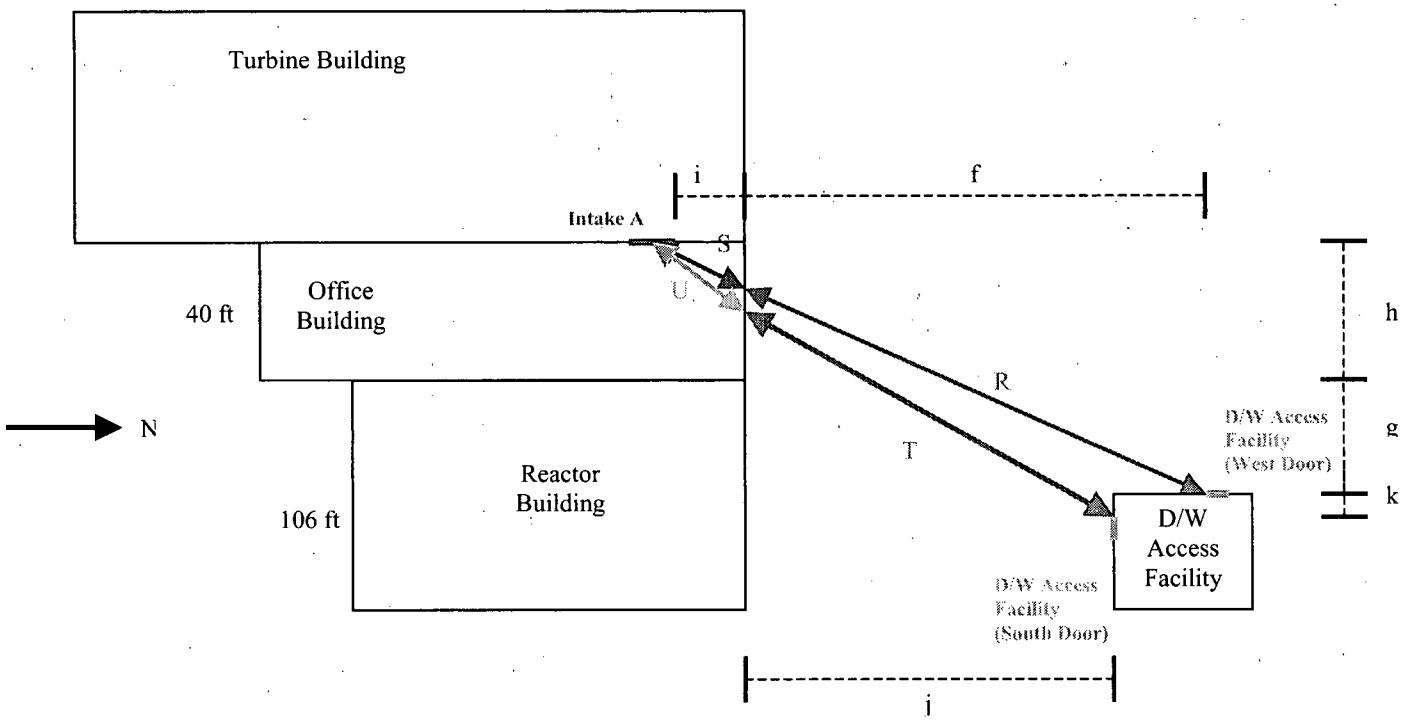
Total Taut String Length = R + S = 158.6 + 95.1 = **253.7 ft = 77.3 m**

Redirected Direction from Intake B to the Southwest Corner of the Reactor Building = 130° from true north

$$\tan\theta = \frac{m}{n} = \frac{75.5}{53.6} = 1.4086$$
$$\theta = 54.6°$$
$$90° + 54.6° = 144.6° \textit{ from plant north}$$
$$144.6° - 14.7° = 129.9° \textit{ from true north}$$



Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A



R = Slant distance from the D/W Access Facility (West Door) to the Office Building Roof

S = Slant distance from the Office Building Roof to Intake A

T = Slant distance from the D/W Access Facility (South Door) to the Office Building Roof

U = Slant distance from the Office Building Roof to Intake A

f = plant north-south horizontal distance from the D/W Access Facility (West Door) to the north wall of the Reactor Building = 120.25 (sketch from Russell Smith)

g = plant east-west horizontal distance from the D/W Access Facility (West Door) to the west wall of the Reactor Building = 56.7 ft (measured; sketch from Russell Smith)

h = plant east-west horizontal distance from the west wall of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 5)

i= plant north-south horizontal distance from the north wall of the Office Building to Intake A = 38.25 ft (Sketches from John Yuen, Item 6A)

j = plant north-south horizontal distance from the D/W Access Facility (South Door) to the north wall of the Reactor Building = 79.75 ft (Sketch from Russell Smith)

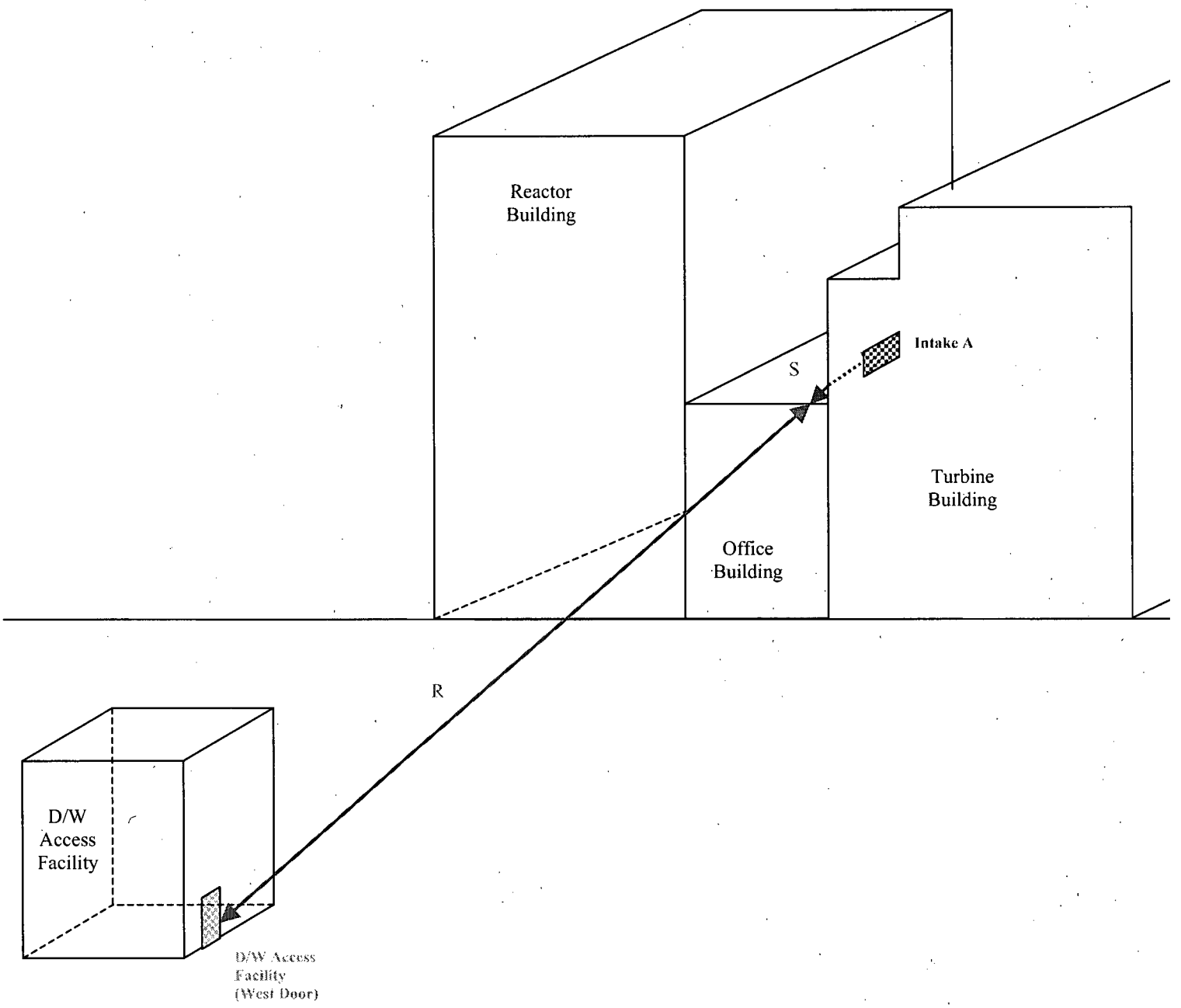
k = plant east-west horizontal distance from the D/W Access Facility (South Door) to the west wall of the D/W Access Facility = 18.4 ft (Sketch from Russell Smith)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

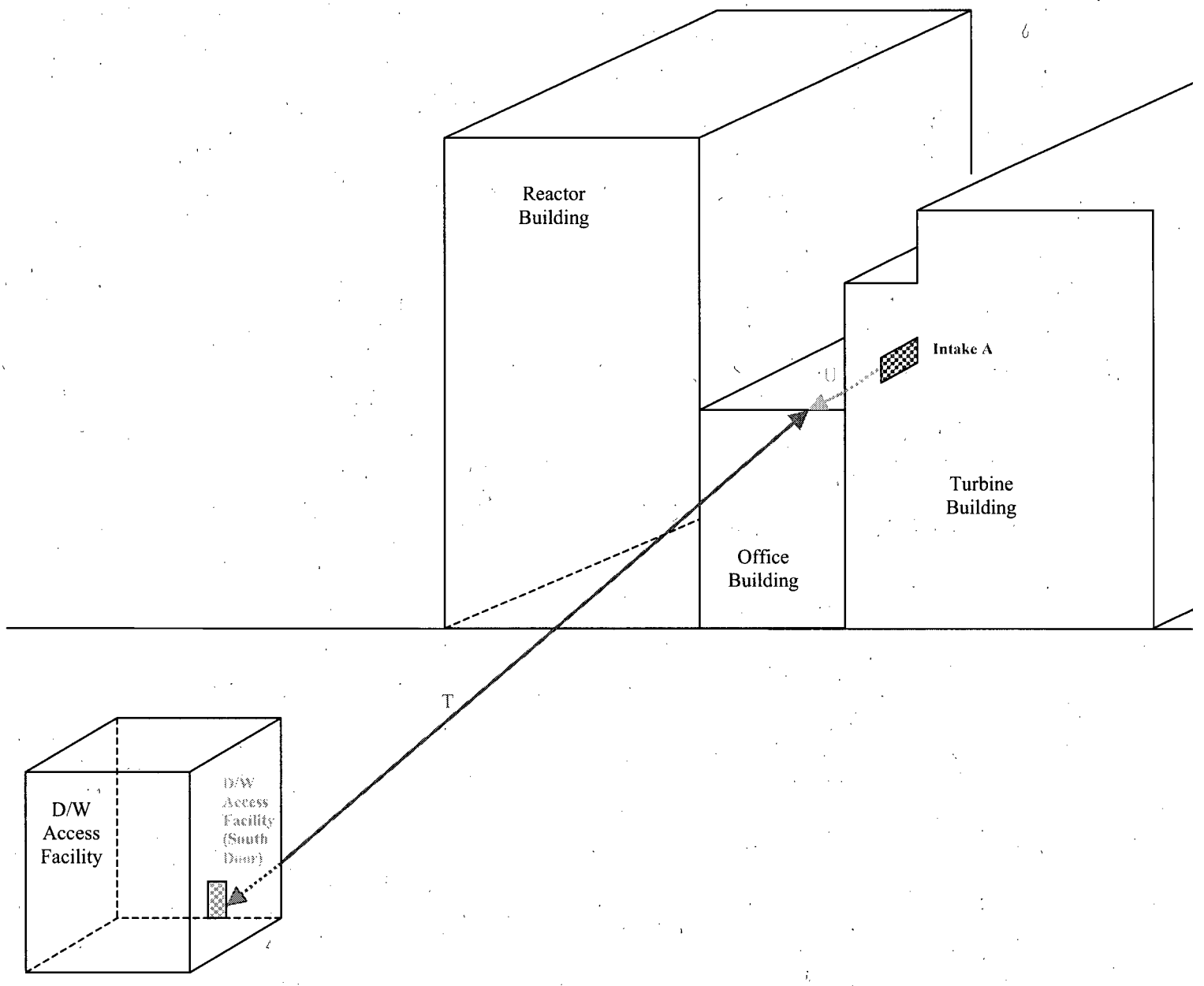
Reactor Building width = 106 ft (from Drawing 3E-153-02-007)

Office Building roof height = 38 ft above grade (Sketches from John Yuen, Item 1)

Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A



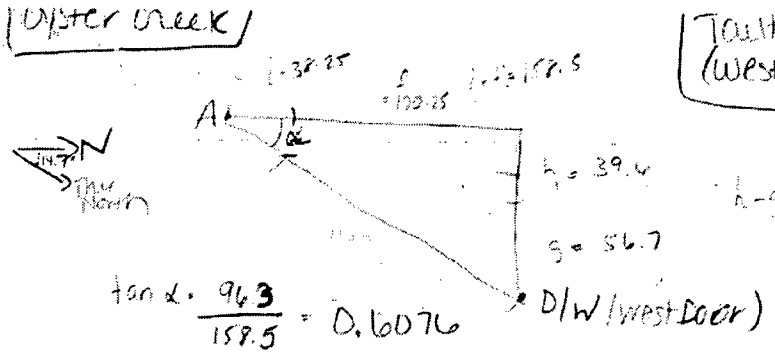
Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A



Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A

Oyster Creek

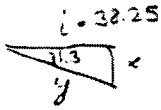
Taut String from D/W Access (West Door) to Intake A.



$h - g = 96.3$

$\tan\alpha = \frac{96.3}{158.5} = 0.6076$

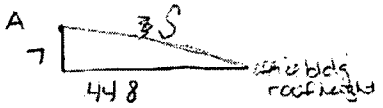
$\alpha = 31.3°$



$\tan 31.3° = \frac{x}{38.25}$ $x = 23.3$ ft

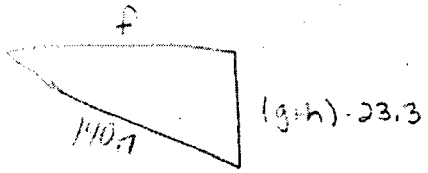
$\cos 31.3 = \frac{38.25}{y}$

$y = 44.8$ ft



$S = \sqrt{44.8^2 + 7^2} = \sqrt{2056.04} = 45.3 = S$

R



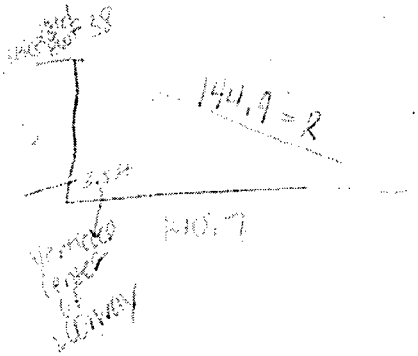
$\sqrt{f^2 + ((g+h) - 23.3)^2}$

$\sqrt{120.25^2 + [(56.7 + 39.6) - 23.3]^2}$

$= \sqrt{120.25^2 + 73^2}$

$\sqrt{19789.0625}$

$= 140.7$ ft



$\sqrt{(38 - 33.5)^2 + 140.7^2}$

$= 144.9$ ft

Total Taut String = $S + R$ = $45.3 + 144.9 =$ 190.2 ft $= 58$ m

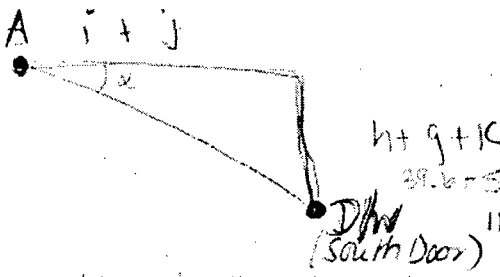
Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A

Oyster Creek

Taut string from D/W Access (South Door) to Intake A

19.7° N → True North

38.25 + 79.75 = 118 ft

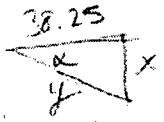


h + g + K =
38.25 + 30.7 + 18.4 =
114.7 ft

(L)

$\tan\alpha = \frac{h+g+K}{i+j} = \frac{114.7}{118} = 0.9720$

$\alpha = 44.2°$

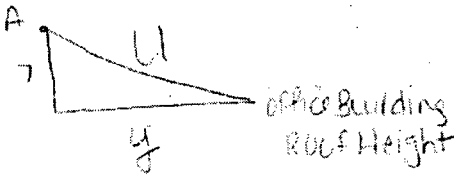


$\tan 44.2° = \frac{x}{38.25}$

$x = 37.2$ ft

$\cos 44.2 = \frac{38.25}{y}$

$53.4 \text{ ft} = y$



$L = \sqrt{y^2 + 7^2}$

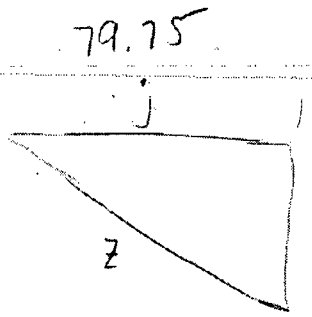
$L = \sqrt{53.4^2 + 7^2}$

$L = 53.9$ ft

Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake A

Taut String from D/W Access (South Door) to Intake A

(1)



$(h+g+k) - x$

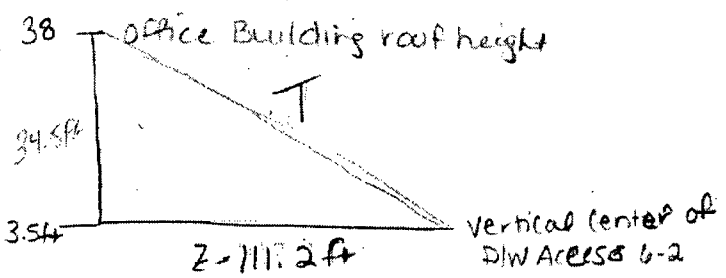
$(114.7ft) - 37.2ft$

$77.5ft$

$Z = \sqrt{j^2 + [(h+g+k) - x]^2}$

$Z = \sqrt{79.75^2 + 77.5^2}$

$Z = 111.2ft$



$T = \sqrt{34.5^2 + 111.2^2}$

$T = 116.4$

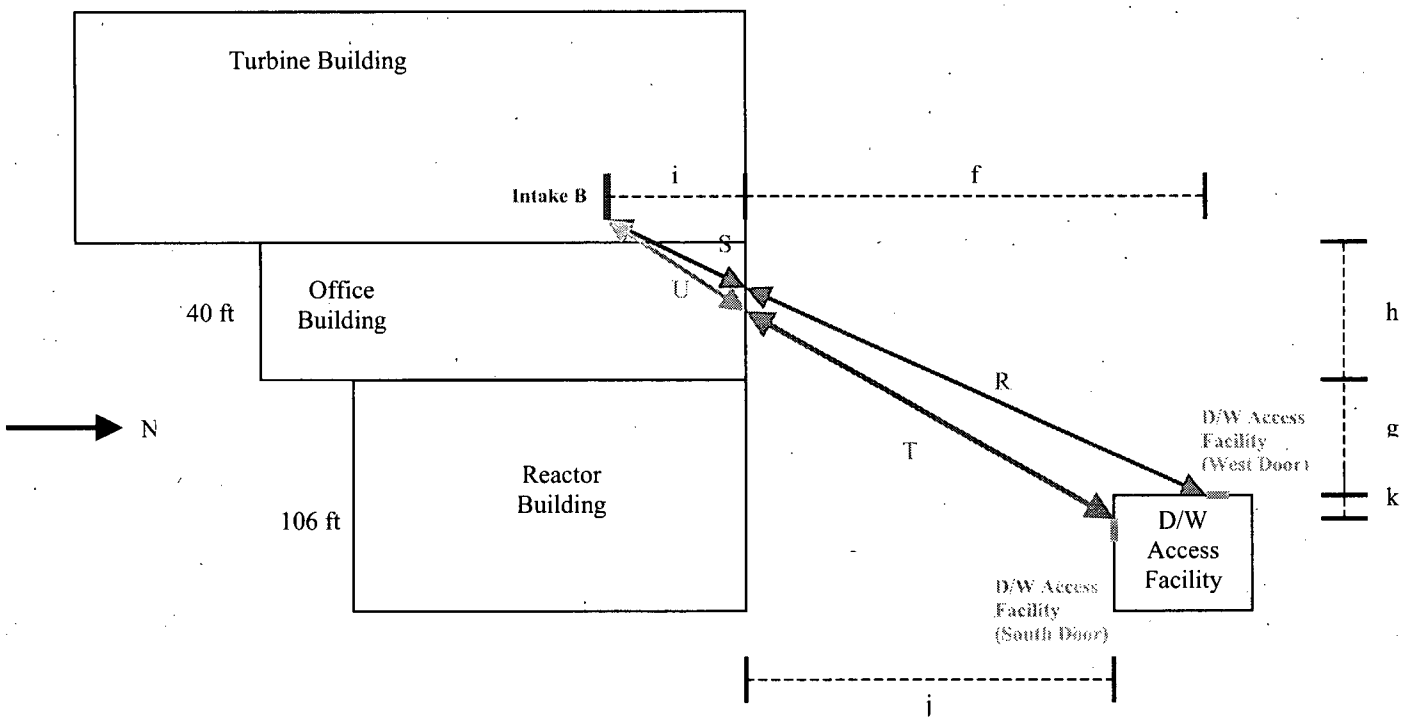
Total Taut String = T + LL

$116.4 + 53.9$

$= 170.3$ ft

$= 51.9m$

Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake B



R = Slant distance from the D/W Access Facility (West Door) to the Office Building Roof

S = Slant distance from the Office Building Roof to Intake B

T = Slant distance from the D/W Access Facility (South Door) to the Office Building Roof

U = Slant distance from the Office Building Roof to Intake B

f = plant north-south horizontal distance from the D/W Access Facility (West Door) to the north wall of the Reactor Building = 120.25 (sketch from Russell Smith)

g = plant east-west horizontal distance from the D/W Access Facility (West Door) to the west wall of the Reactor Building = 56.7 ft (measured; sketch from Russell Smith)

h = plant east-west horizontal distance from the west wall of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 9)

i= plant north-south horizontal distance from the north wall of the Office Building to Intake B = 61.5 ft (Sketches from John Yuen, Item 6A)

j = plant north-south horizontal distance from the D/W Access Facility (South Door) to the north wall of the Reactor Building = 79.75 ft (Sketch from Russell Smith)

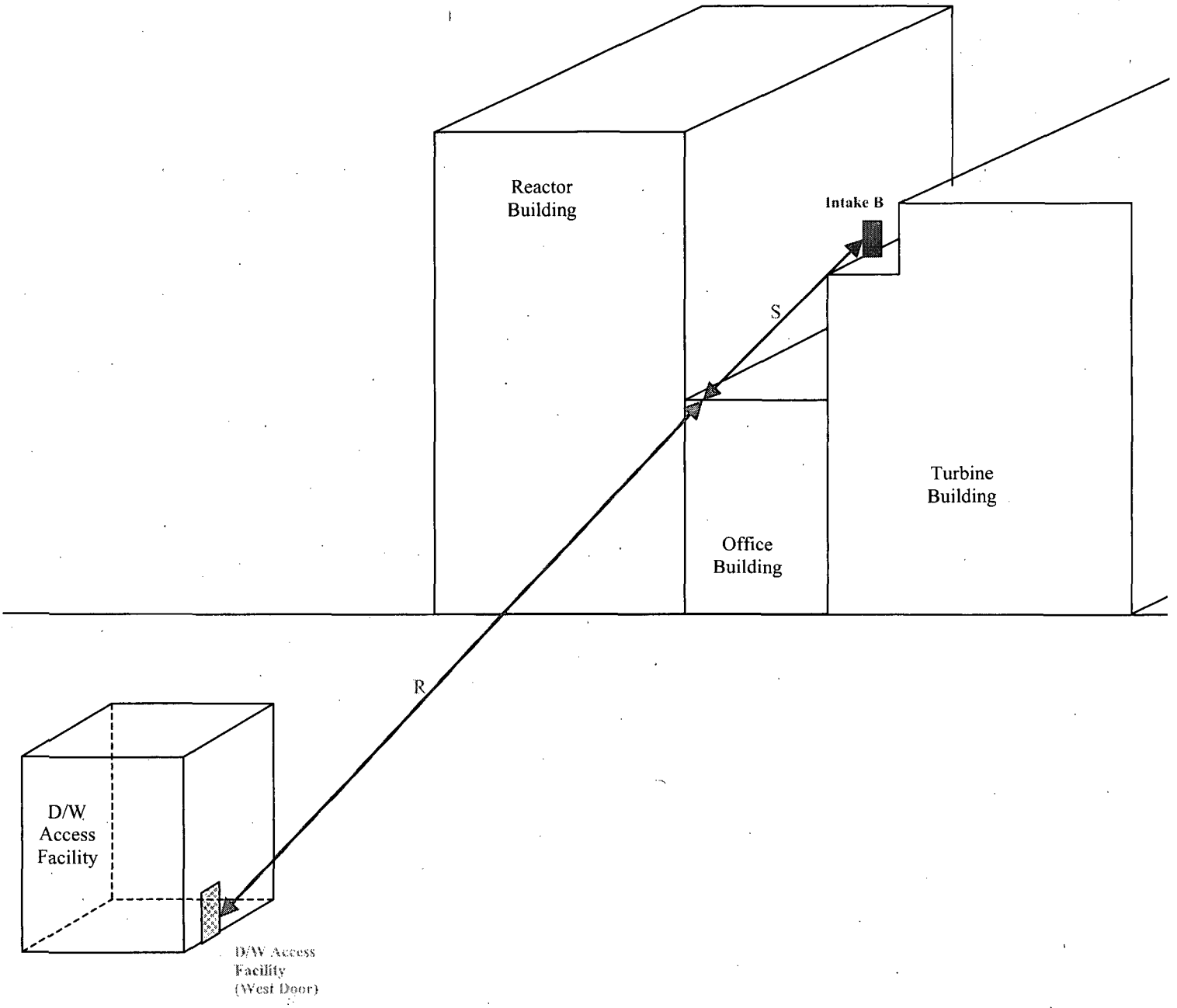
k = plant east-west horizontal distance from the D/W Access Facility (South Door) to the west wall of the D/W Access Facility = 18.4 ft (Sketch from Russell Smith)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

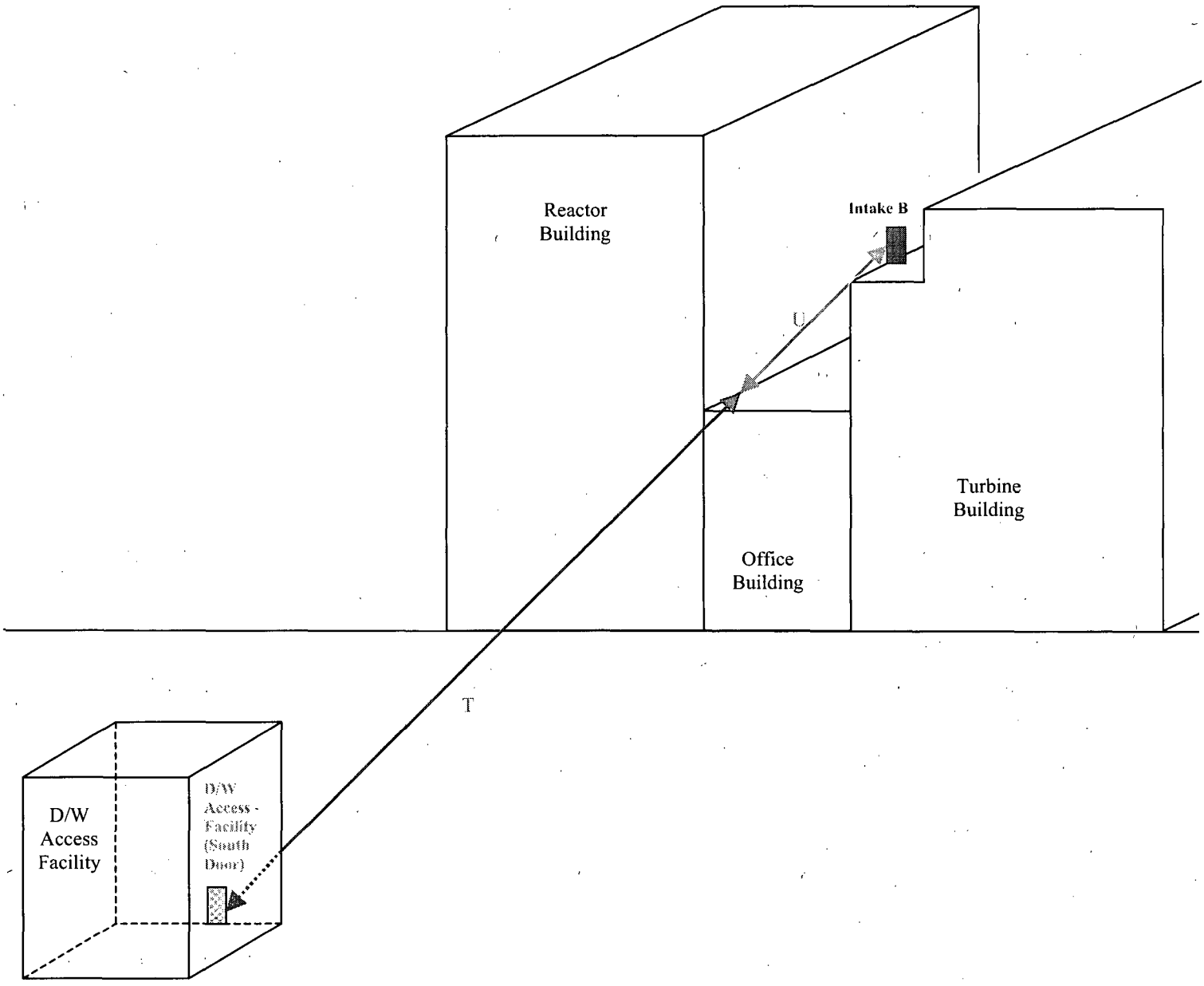
Reactor Building width = 106 ft (from Drawing 3E-153-02-007)

Office Building roof height = 38 ft above grade (Sketches from JohnYuen, Item 1)

Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake B



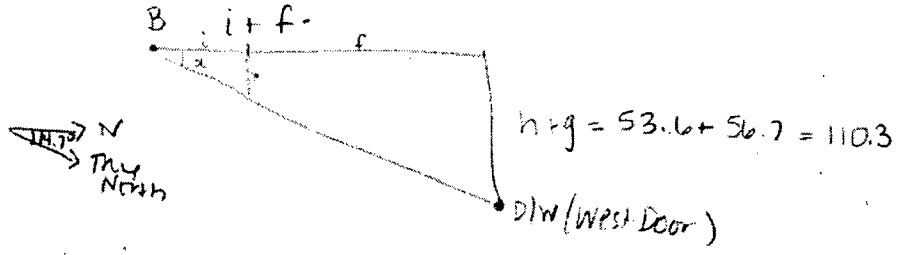
Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake B



Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake B

Taut string from D/W Access (West Door) to Intake B

61.5 + 120.25 = 181.75



h + g = 53.6 + 56.7 = 110.3

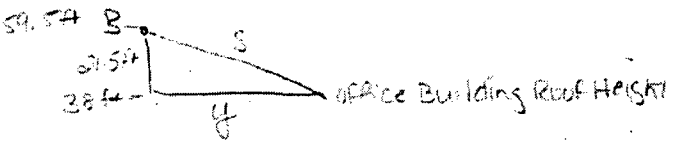
$\tan\alpha = \frac{110.3}{181.75} = 0.6069$

$\alpha = 31.3°$

$\tan\alpha = \frac{x}{i}$ $\quad$ $\cos\alpha = \frac{i}{y}$

$\tan 31.3° = \frac{x}{61.5}$ $\quad$ $\cos 31.3 = \frac{61.5}{y}$

37.4 ft = x $\quad$ y = 72.0 ft



$S = \sqrt{21.5^2 + 72^2}$

S = 75.1 ft

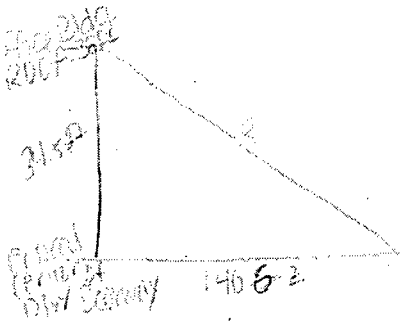
R

g + h − x = 110.3 − 37.4 = 72.9

$z = \sqrt{f^2 + [g + h - x]^2}$

$z = \sqrt{120.25^2 + 72.92^2}$

z = 140.6 ft



$R = \sqrt{31.5^2 + 140.6^2}$

R = 144.8

Total Taut String =

R + S =

144.8 + 75.1

= 219.9 ft

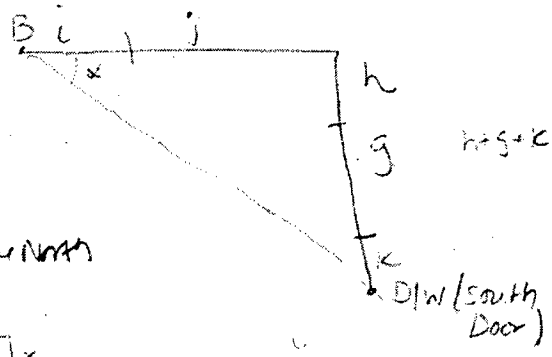
= 67.0 m

Calculation of Taut String Length
D/W Access Facility to Control Room HVAC Intake B

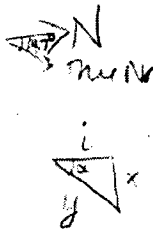
Taut String from D/W Access (South Door) to Intake B

141.25

61.5 + 79.75



h+g+k = 128.7 ft



$\tan\alpha = \frac{h+g+k}{i+j}$

$\tan\alpha = \frac{128.7}{141.25}$

$\tan\alpha = 0.9112$

$\alpha = 42.3°$

$\tan\alpha = \frac{x}{i}$

$\tan 42.3° = \frac{x}{61.5}$

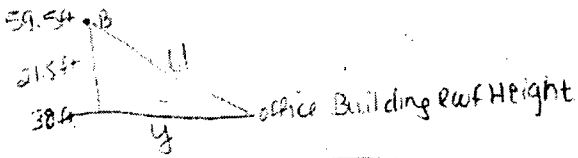
$56.0 = x$

$\cos\alpha = \frac{i}{y}$

$\cos 42.3° = \frac{61.5}{y}$

$83.1 = y$

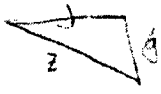
(U)



$= \sqrt{21.5^2 + 83.1^2}$

U = 85.8 ft

(T)



(g+h+k) − x

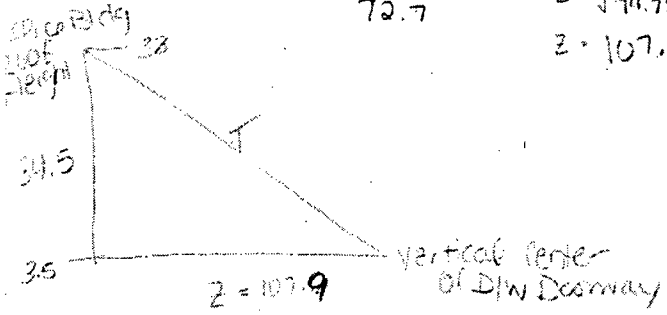
128.7 − 56.0

72.7

$z = \sqrt{j^2 + [(g+h+k) - x]^2}$

$z = \sqrt{79.75^2 + 72.7^2}$

z = 107.9 ft



z = 107.9

$T = \sqrt{34.5^2 + z^2}$

$T = \sqrt{34.5^2 + 107.9^2}$

T = 113.3 ft

Total Taut String =

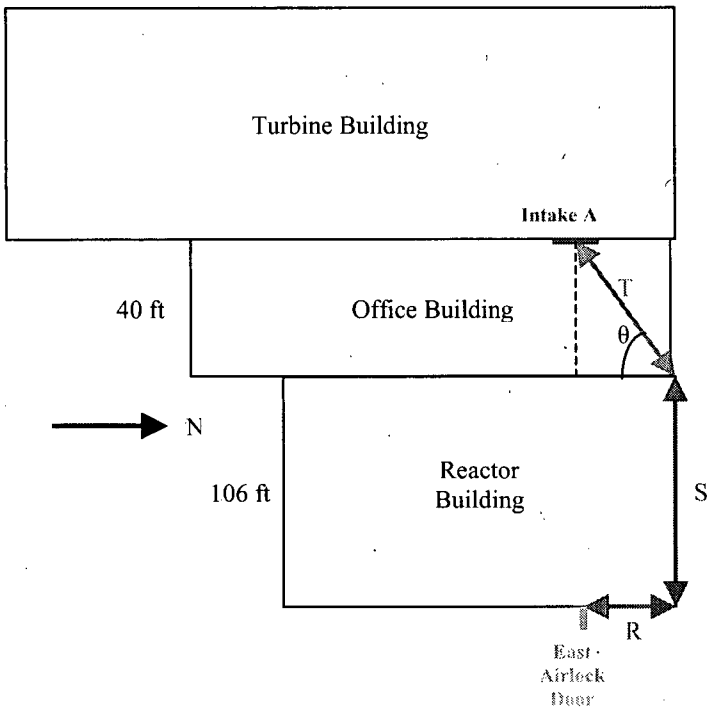
T + U =

113.3 + 85.8

= 199.1 ft

= 60.7 m

Calculation of Taut String Length
East Airlock Door to Control Room HVAC Intake A



R = Plant north-south horizontal distance from East Airlock Door to Northeast Corner of the Reactor Building

S = Slant distance along the north face of the Reactor Building to the top northeast corner of the Office Building

T = Slant distance from the top northeast corner of the Office Building to the Intake A

East Airlock Door height= 4 ft above grade (assumed middle of doorway)

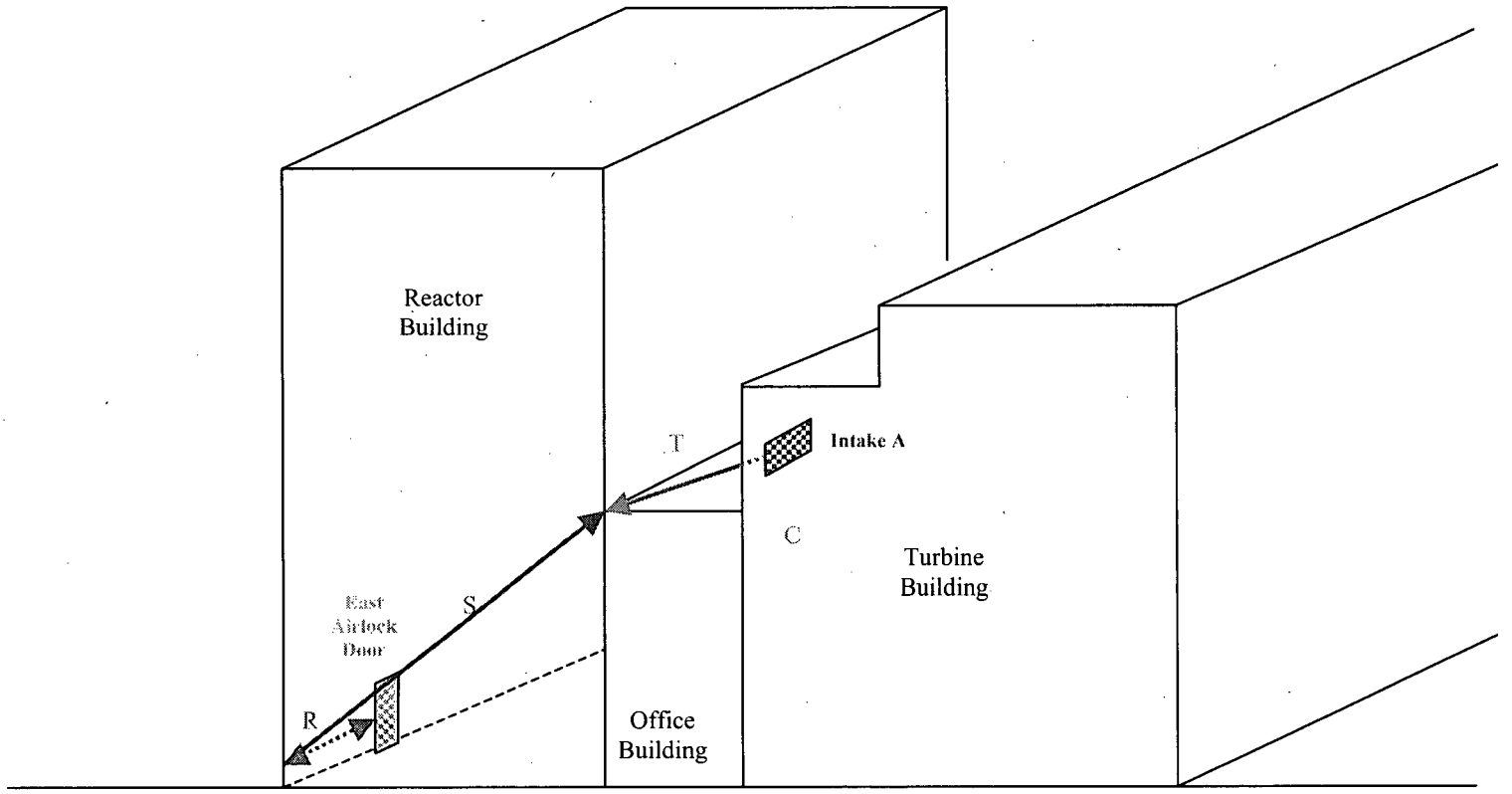
Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

Plant east-west horizontal distance from and normal to the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 9)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

Reactor Building width = 106 ft (from Drawing 3E-153-02-007)

Plant north-south horizontal distance from the northwest corner of the Office Building to Intake A = 38.25 ft (Sketches from John Yuen)



Calculation of Taut String Length
East Airlock Door to Control Room HVAC Intake A

R = Plant north-south horizontal distance from East Airlock Door to northeast corner of the Reactor Building = 35 ft (Sketches from John Yuen)

S = Slant Distance along the north face of the Reactor Building to the top northeast corner of the Office Building = 111.3 ft, calculated as follows:

$$S = \sqrt{(\text{Reactor Building width})^2 + ((\text{Office Building height - East Airlock Door height}))^2}$$
$$= \sqrt{106^2 + (38-4)^2}$$
$$= \sqrt{12392}$$
$$= 111.3\,ft$$

T = Slant distance from the top northeast corner of the Office Building to Intake A = 55.5 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake A (along the Office Building Roof height) =

$$\sqrt{(\text{Plant east - west horizontal distance from and normal to the Reactor Building to Intake A})^2 + (\text{Plant north - south horizintal distance from the northwest corner of the Office Building to Intake A})^2}$$
$$\sqrt{(39.6)^2 + (38.25)^2}$$
$$\sqrt{3031}$$
$$55.1\,ft$$

$$T = \sqrt{(\text{Intake A height above Office Building roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake A})^2}$$
$$= \sqrt{(45-38)^2 + (55.1)^2}$$
$$= \sqrt{3085}$$
$$= 55.5\,ft$$

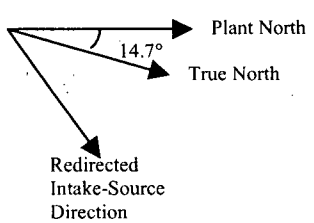
Total Taut String Length = R + S + T = 35 + 111.3 + 55.5 = **201.8 ft = 61.5 m**

Redirected Direction from Intake A to the Northwest Corner of the Reactor Building = 31° from true north

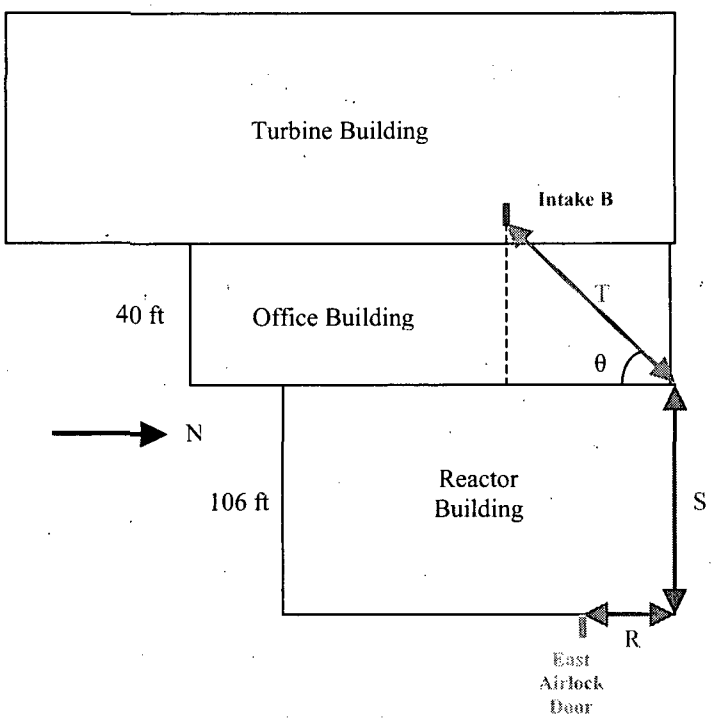
$$\tan\theta = \frac{39.6}{38.25} = 1.0353$$

$\theta = 46°$ *from plant north*

$46° - 14.7° = 31.3°$ *from true north*



Calculation of Taut String Length
East Airlock Door to Control Room HVAC Intake B



R = Plant north-south horizontal distance from East Airlock Door to northeast corner of the Reactor Building

S = Slant distance along the north face of the Reactor Building to the top northeast corner of the Office Building

T = Slant distance from the top northeast corner of the Office Building to the Intake B

East Airlock Door height= 4 ft above grade (assumed middle of doorway)

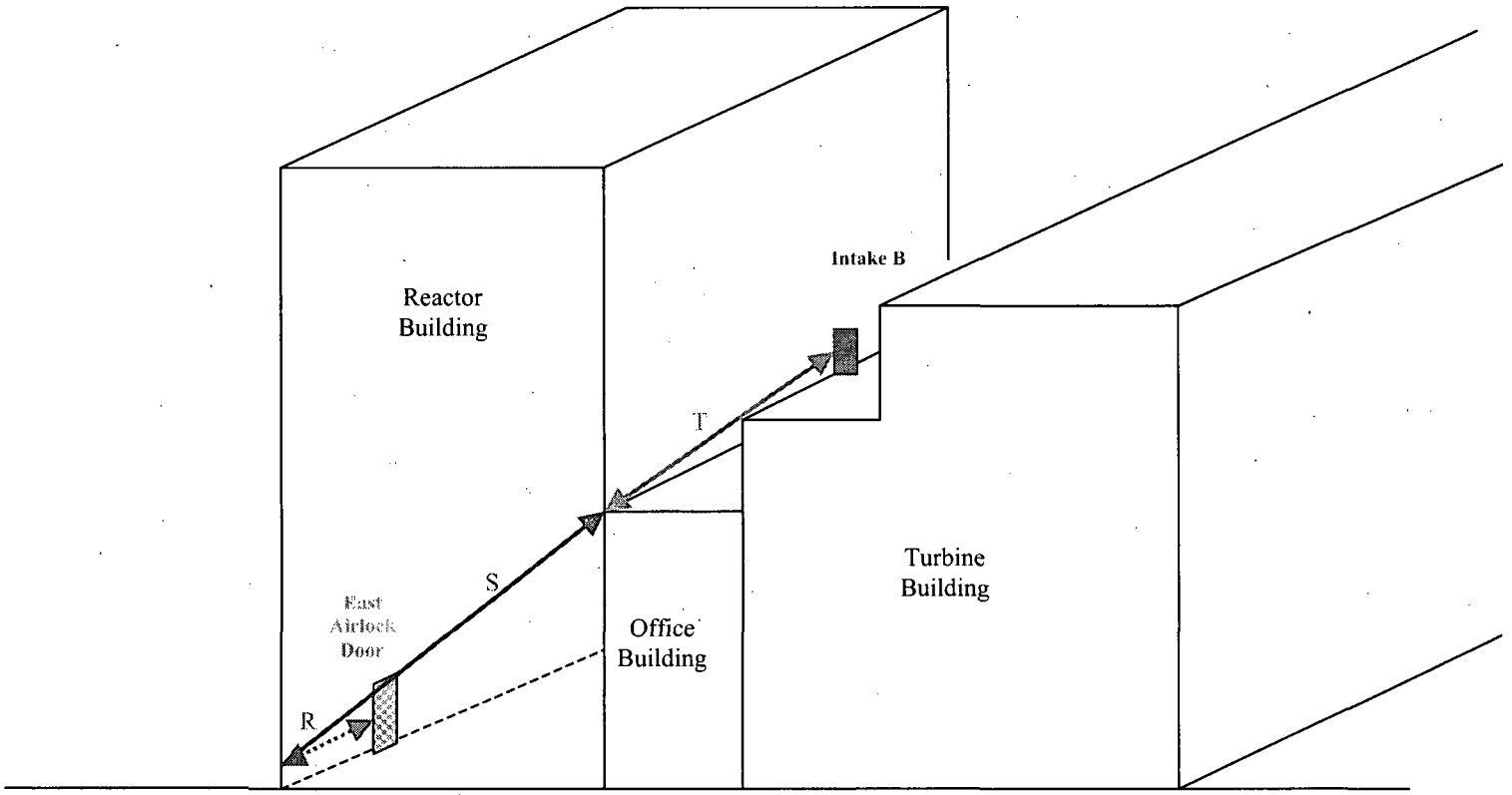
Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

Plant east-west horizontal distance from and normal to the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 9)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Reactor Building width = 106 ft (from Drawing 3E-153-02-007)

Plant north-south horizontal distance from the northwest corner of the Office Building to Intake B = 61.5 ft (Sketches from John Yuen, Item 6A)



Calculation of Taut String Length
East Airlock Door to Control Room HVAC Intake B

R = Plant north-south horizontal distance from East Airlock Door to northeast corner of the Reactor Building = 35 ft (Sketches from John Yuen)

S = Slant distance along the north face of the Reactor Building to the top northeast corner of the Office Building = 111.3 ft, calculated as follows:

$$S = \sqrt{(\text{Reactor Building width})^2 + ((\text{Office Building height - East Airlock Door height}))^2}$$
$$= \sqrt{106^2 + (38-4)^2}$$
$$= \sqrt{12392}$$
$$= 111.3\,ft$$

T = Slant distance from the top northeast corner of the Office Building to Intake B = 84.9 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake B (along the Office Building Roof height)=

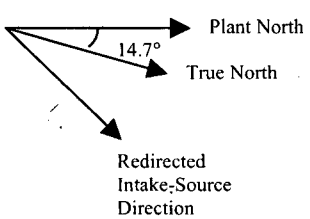
$$\sqrt{(\text{Plant east - west horizontal distance from the Reactor Building to Intake B})^2 + (\text{Plant north - south horizonal distance from the northwest corner of the Office Building to Intake B})^2}$$
$$\sqrt{(53.6)^2 + (61.5)^2}$$
$$\sqrt{6655}$$
$$81.6\,ft$$

$$T = \sqrt{(\text{Intake B height above Office Building Roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake B})^2}$$
$$= \sqrt{(59.5-38)^2 + (81.6)^2}$$
$$= \sqrt{7121}$$
$$= 84.4\,ft$$

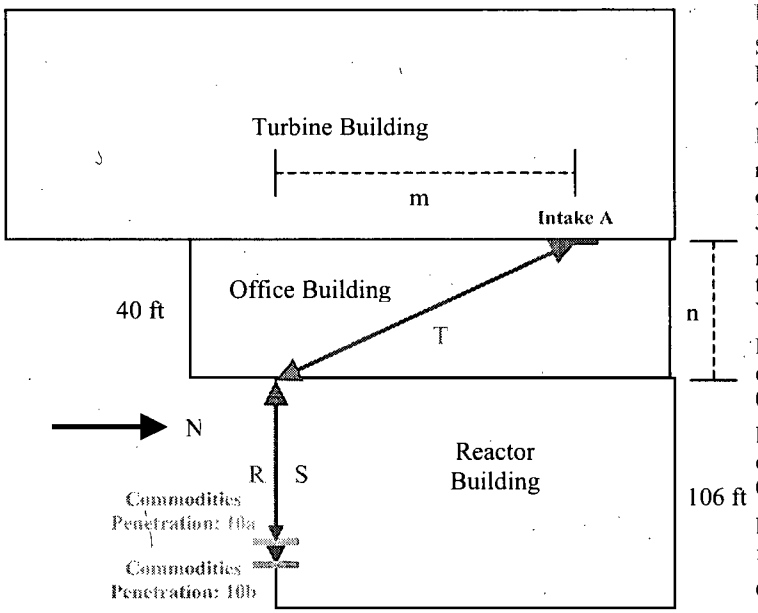
Total Taut String Length = R + S + T = 35 + 111.3 + 84.4 = **230.7 ft = 70.3 m**

Redirected Direction from Intake B to the Northwest Corner of the Reactor Building = 26° from true north

$$\tan\theta = \frac{53.6}{61.5} = 0.8715$$
$$\theta = 41.1° \textit{ from plant north}$$
$$41.1° - 14.7° = 26.4° \textit{ from true north}$$



Calculation of Taut String Length
Commodities Penetrations on the Reactor Building South Wall to Control Room HVAC Intake A



R = Slant distance from 10a to the southwest corner of the Reactor Building

S = Slant distance from 10b to the southwest corner of the Reactor Building

T = Slant distance from the southwest corner of the Reactor Building to Intake A

m = plant north-south horizontal distance from the south wall of the Reactor Building to Intake A = 98.9 ft (Sketches from John Yuen, Item 5)

n = plant east-west horizontal distance from the west wall of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 5)

Plant east-west horizontal distance from 10a to the southwest corner of the Reactor Building = 67.5 ft (Drawing 3E-153-02-002, Revision 10)

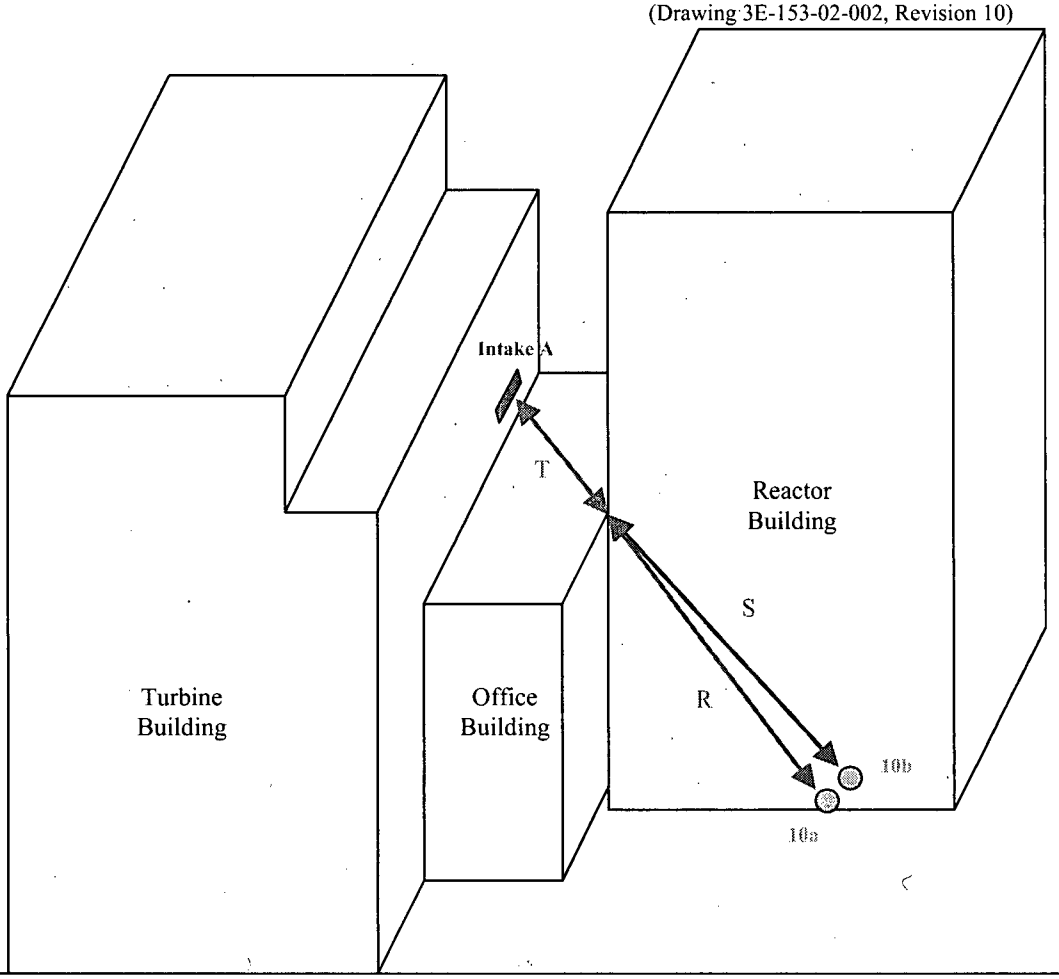
Plant east-west horizontal distance from 10b to the southwest corner of the Reactor Building = 67.67 ft (Drawing 3E-153-02-002, Revision 10)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen, Item 5)

Office Building roof height = 38 ft above grade (Sketches from JohnYuen, Item 1)

Height of 10a = 1.75 ft above grade (Drawing 3E-153-02-002, Revision 10)

Height of 10b = 6.5 ft above grade (Drawing 3E-153-02-002, Revision 10)



Calculation of Taut String Length
Commodities Penetrations on the Reactor Building South Wall to Control Room HVAC Intake A

R = Slant distance from 10a to the Top of the Office Building = 76.6 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from 10a to the southwest edge of the Reactor Building})^2 + (\text{Office Building roof height - height of 10a})^2}$$
$$= \sqrt{(67.5)^2 + (38 - 1.75)^2}$$
$$= \sqrt{5870.3}$$
$$= 76.6 \text{ ft}$$

S = Slant distance from 10b to the Top of the Office Building = 74.6 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from 10b to the southwest edge of the Reactor Building})^2 + (\text{Office Building roof height - height of 10b})^2}$$
$$= \sqrt{(67.67)^2 + (38 - 6.5)^2}$$
$$= \sqrt{5571.5}$$
$$= 74.6 \text{ ft}$$

T = Slant distance from the corner of the Reactor Building (at the Office Building height) to Intake A = 106.7 ft, calculated as follows:

$$S = \sqrt{\left(\sqrt{(m)^2 + (n)^2}\right)^2 + (\text{Height of Intake A - Office Building roof height})^2}$$
$$= \sqrt{\left(\sqrt{(98.9)^2 + (39.6)^2}\right)^2 + (45 - 38)^2}$$
$$= \sqrt{\left(\sqrt{11349}\right)^2 + 7^2}$$
$$= \sqrt{(106.5)^2 + 7^2}$$
$$= \sqrt{11391}$$
$$= 106.7 \text{ ft}$$

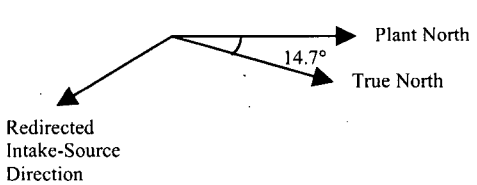
10a Total Taut String Length = R + T = 76.6 + 106.7 = 183.3 **ft = 55.9 m**

10b Total Taut String Length = S + T = 74.6 + 106.7 = 181.3 **ft = 55.3 m**

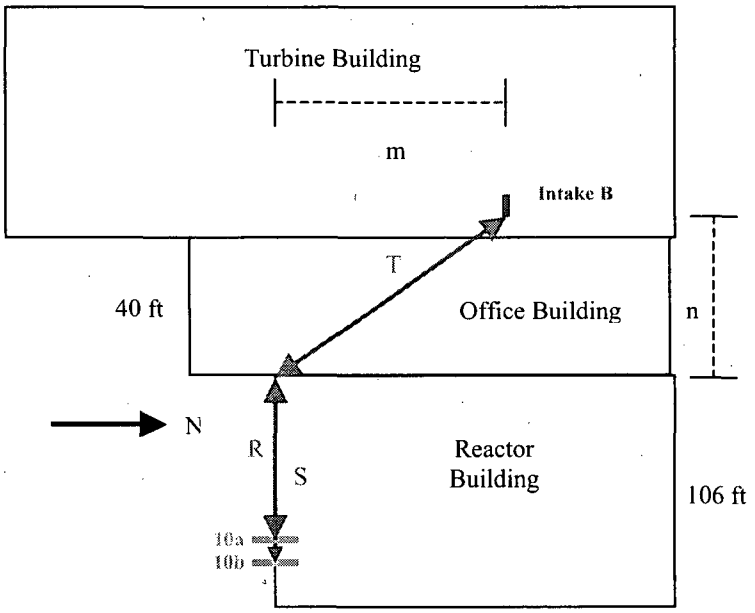
Therefore since the Commodities Penetration 10b taut string length is closer than that of Penetration 10a to Intake A, it will be modeled.

Redirected Direction from Intake A to the Southwest Corner of the Reactor Building = 144° from true north

$$\tan\theta = \frac{m}{n} = \frac{98.9}{39.6} = 2.4975$$
$$\theta = 68.2°$$
$$90° + 68.2° = 158.2° \textit{ from plant north}$$
$$158.2° - 14.7° = 143.5° \textit{ from true north}$$
$$\therefore 144° \textit{ from true north}$$



Calculation of Taut String Length
Commodities Penetrations on the Reactor Building South Wall
to Control Room HVAC Intake B



R = Slant distance from 10a to the southwest corner of the Reactor Building

S = Slant distance from 10b to the southwest corner of the Reactor Building

T = Slant distance from the southwest corner of the Reactor Building to Intake A

m = plant north-south horizontal distance from the south wall of the Reactor Building to Intake B = 75.5 ft (Sketches from John Yuen, Item 5)

n = east-west horizontal distance from the west wall of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 5)

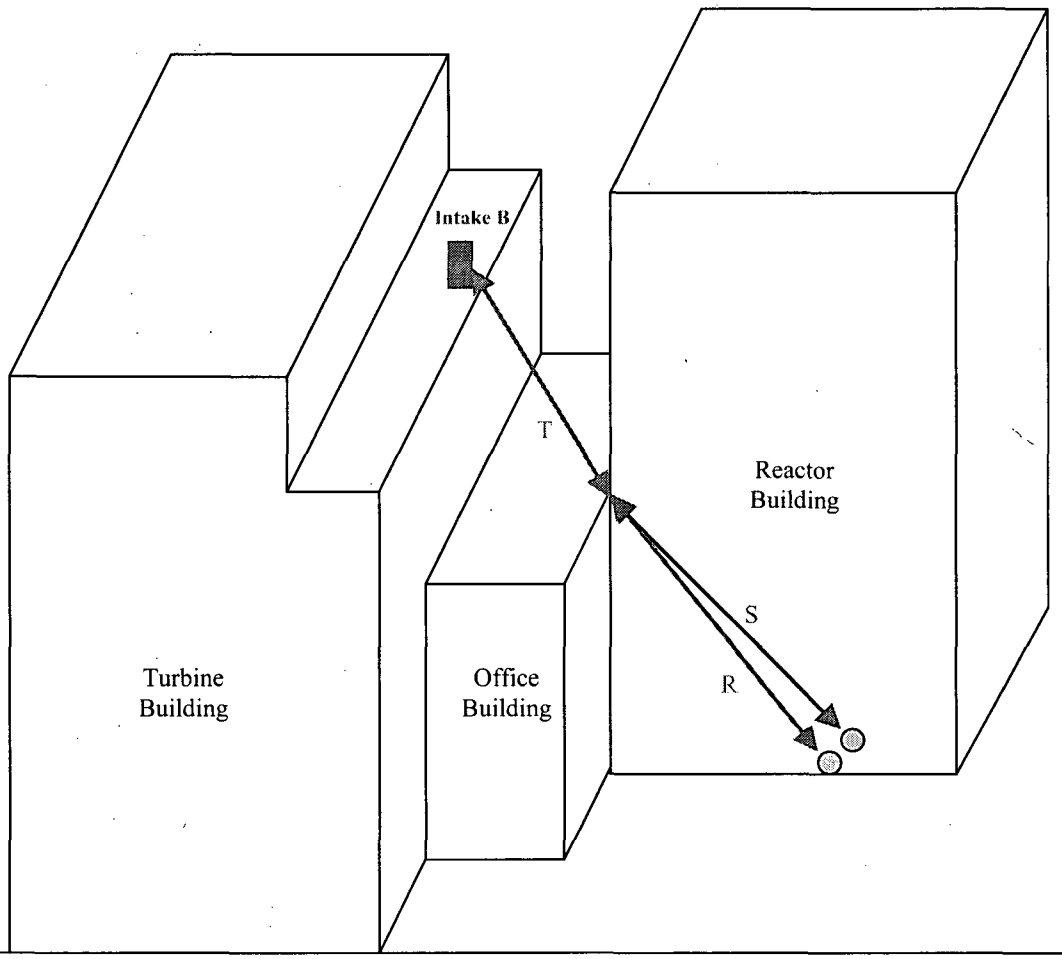
Plant east-west horizontal distance from 10a to the southwest corner of the Reactor Building = 67.5 ft (Drawing 3E-153-02-002, Revision 10)

Plant east-west horizontal distance from 10b to the southwest corner of the Reactor Building = 67.67 ft (Drawing 3E-153-02-002, Revision 10)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)
Office Building roof height = 38 ft above grade (Sketches from John Yuen, Item 1)

Height of 10a = 1.75 ft above grade
(Drawing 3E-153-02-002, Revision 10)

Height of 10b = 6.5 ft above grade
(Drawing 3E-153-02-002, Revision 10)



Calculation of Taut String Length
Commodities Penetrations on the Reactor Building South Wall
to Control Room HVAC Intake B

R = Slant distance from 10a to the top of the Office Building = 76.6 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from 10a to the southwest corner of the Reactor Building})^2 + (\text{Office Building roof height - height of 10a})^2}$$
$$= \sqrt{(67.5)^2 + (38 - 1.75)^2}$$
$$= \sqrt{5870.3}$$
$$= 76.6 \text{ ft}$$

S = Slant distance from 10b to the top of the Office Building = 74.6 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from 10b to the southwest corner of the Reactor Building})^2 + (\text{Office Building roof height - height of 10b})^2}$$
$$= \sqrt{(67.67)^2 + (38 - 6.5)^2}$$
$$= \sqrt{5571.5}$$
$$= 74.6 \text{ ft}$$

T = Slant distance from the southwest corner of the Reactor Building (at the Office Building height) to Intake B = 95.1 ft, calculated as follows:

$$S = \sqrt{\left(\sqrt{(m)^2 + (n)^2}\right)^2 + (\text{Height of Intake B - Office Building roof height})^2}$$
$$= \sqrt{\left(\sqrt{(75.5)^2 + (53.6)^2}\right)^2 + (59.5 - 38)^2}$$
$$= \sqrt{\left(\sqrt{8573}\right)^2 + 21.5^2}$$
$$= \sqrt{(92.6)^2 + 21.5^2}$$
$$= \sqrt{9037}$$
$$= 95.1 \text{ ft}$$

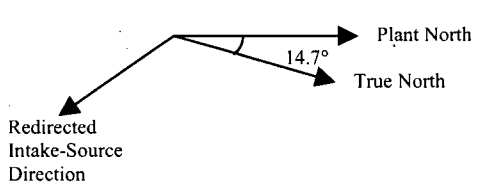
10a Total Taut String Length = R + T = 76.6 + 95.1 = **171.7 ft = 52.3 m**

10b Total Taut String Length = S + T = 74.6 + 95.1 = **169.7 ft = 51.7 m**

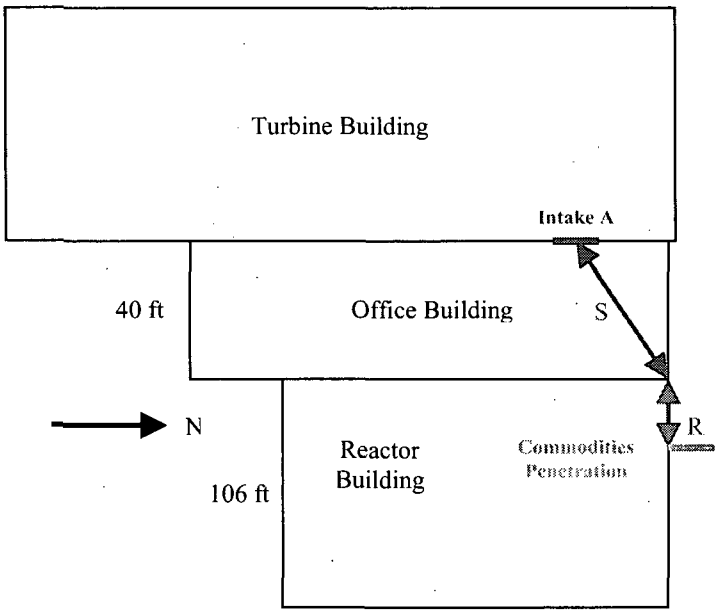
Therefore since the Commodities Penetration 10b taut string length is closer that that of Penetration 10a to Intake A, it will be modeled.

Redirected Direction from Intake B to the Southwest Corner of the Reactor Building = 130° from true north

$$\tan\theta = \frac{m}{n} = \frac{75.5}{53.6} = 1.4086$$
$$\theta = 54.6°$$
$$90° + 54.6° = 144.6° \textit{ from plant north}$$
$$144.6° - 14.7° = 129.9° \textit{ from true north}$$
$$\therefore 130° \textit{ from true north}$$



Calculation of Taut String Length
Commodities Penetration on the Reactor Building North Wall to Control Room HVAC Intake A



R = Slant distance along the north face of the Reactor Building from the Commodities Penetration to the top northeast corner of the Office Building

S = Slant distance from the top northeast corner of the Office Building to the Intake A

Commodities Penetration height = 3.75 ft above grade (Drawing 3E-153-02-002, Revision 10)

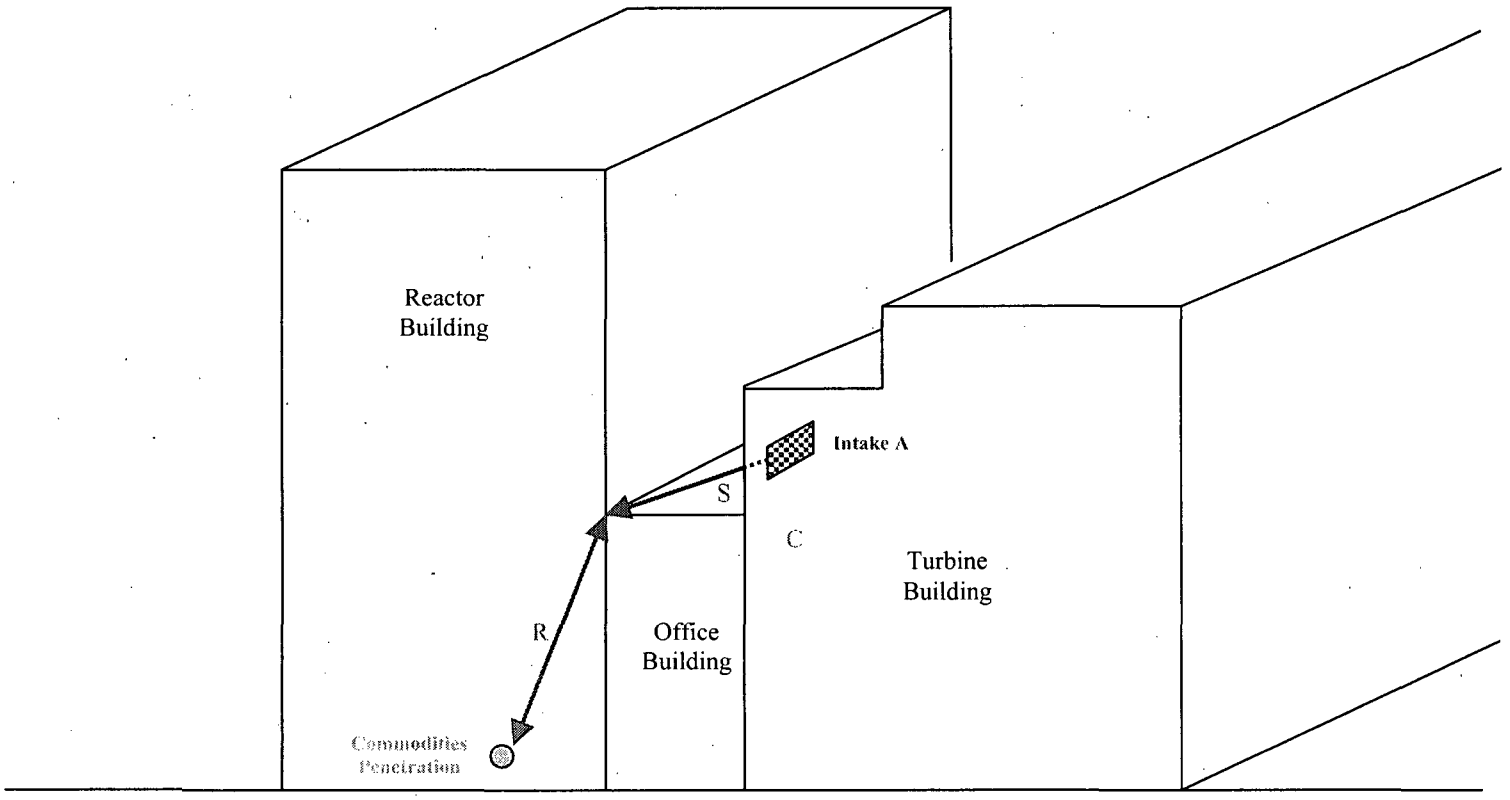
Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

Plant east-west horizontal distance from the west wall of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 5)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

Plant north-south horizontal distance from the northwest corner of the Office Building to Intake A = 38.25 ft (Sketches from John Yuen)

Plant east-west horizontal distance from the Commodities Penetration to the northwest corner of the Reactor Building = 30.42 ft ((Drawing 3E-153-02-002, Revision 10))



Calculation of Taut String Length
Commodities Penetration on the Reactor Building North Wall
to Control Room HVAC Intake A

R = Slant Distance along the north face of the Reactor Building from the Commodities Penetration to the top northeast corner of the Office Building = 45.8 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from th commodities Penetration to the northwest corner of the Reactor Building})^2 + ((\text{Office Building height - Commodities Penetration height}))^2}$$

$$= \sqrt{(30.42)^2 + (38 - 3.75)^2}$$

$$= \sqrt{2098.4}$$

$$= 45.8\,ft$$

S = Slant distance from the top northeast corner of the Office Building to Intake A = 55.5 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake A (along the Office Building Roof height) =

$$\sqrt{(\text{Plant east - west horizontal distance from the west wall of the Reactor Building to Intake A})^2 + (\text{Plnat north - south horizintal distance from the northwest corner of the Office Building to Intake A})^2}$$

$$\sqrt{(39.6)^2 + (38.25)^2}$$

$$\sqrt{3031}$$

$$55.1\,ft$$

$$S = \sqrt{(\text{Intake A height above Office Building roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake A})^2}$$

$$= \sqrt{(45 - 38)^2 + (55.1)^2}$$

$$= \sqrt{3085}$$

$$= 55.5\,ft$$

Total Taut String Length = R + S = 45.8+ 55.5 = 101.3 ft = **30.9 m**

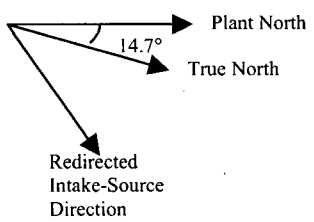
Redirected Direction from Intake A to the Northwest Corner of the Reactor Building = 31° from true north

$$\tan\theta = \frac{39.6}{38.25} = 1.0353$$

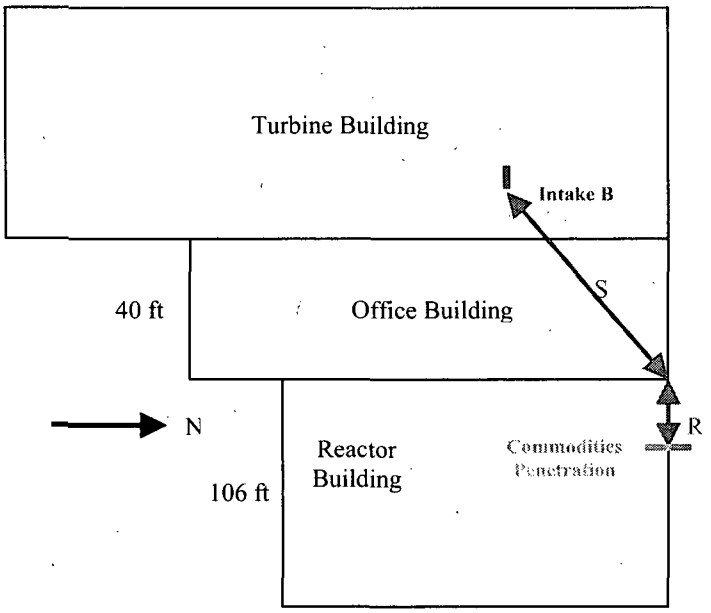
$\theta = 46°$ *from plant north*

$46° - 14.7° = 31.3°$ *from true north*

$\therefore 31°$ *from true north*



Calculation of Taut String Length
Commodities Penetration on Reactor Building North Wall
to Control Room HVAC Intake B



R = Slant distance along the north face of the Reactor Building from the Commodities Penetration to the top northeast corner of the Office Building

S = Slant distance from the top northeast corner of the Office Building to the Intake B

Commodities Penetration height = 3.75 ft above grade (Drawing 3E-153-02-002, Revision 10)

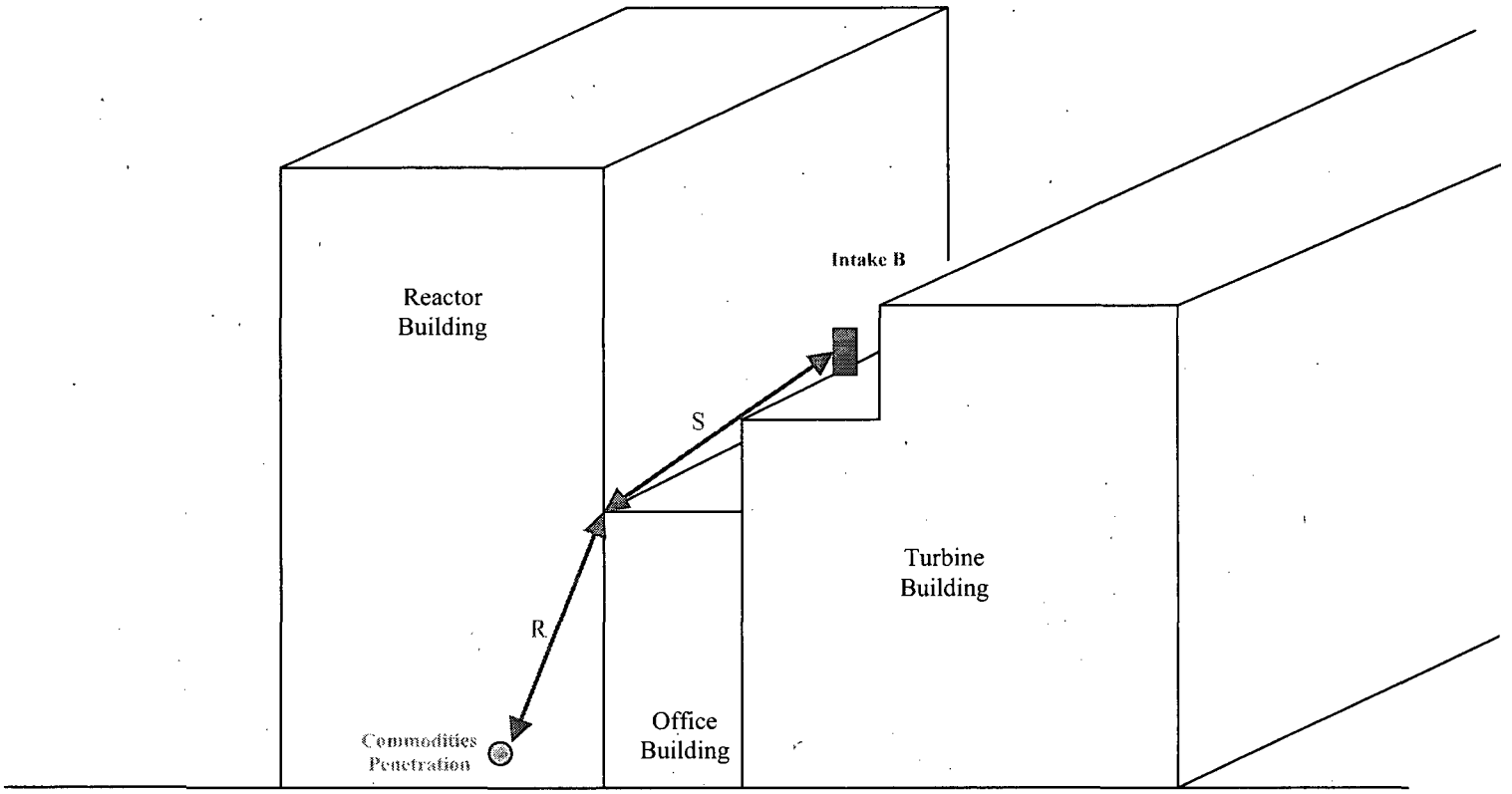
Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

Plant east-west horizontal distance from the west wall of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 9)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Plant north-south horizontal distance from the northwest corner of the Office Building to Intake B = 61.5 ft (Sketches from John Yuen, Item 6A)

Plant east-west horizontal distance from the commodities penetration to the northwest corner of the Reactor Building = 30.42 ft (Sketches, Item 11)



Calculation of Taut String Length
Commodities Penetration on Reactor Building North Wall
to Control Room HVAC Intake B

R = Slant Distance along the north face of the Reactor Building from the Commodities Penetration to the top northeast corner of the Office Building = 45.8 ft, calculated as follows:

$$R = \sqrt{(\text{Plant east - west horizontal distance from the Commodities Penetration to the northwest corner of the Reactor Building})^2 + ((\text{Office Building height - Commodities Penetration height}))^2}$$

$$= \sqrt{(30.42)^2 + (38 - 3.75)^2}$$

$$= \sqrt{2098.4}$$

$$= 45.8\,ft$$

S = Slant distance from the top northeast corner of the Office Building to Intake B = 84.9 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake B (along the Office Building Roof height)=

$$\sqrt{(\text{Plant east - west horizontal distance from the west wall of the Reactor Building to Intake B})^2 + (\text{Plant north - south horizonal distance from the northwest corner of the Office Building to Intake B})^2}$$

$$\sqrt{(53.6)^2 + (61.5)^2}$$

$$\sqrt{6655}$$

$$81.6\,ft$$

$$T = \sqrt{(\text{Intake B height above Office Building Roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake B})^2}$$

$$= \sqrt{(59.5 - 38)^2 + (81.6)^2}$$

$$= \sqrt{7121}$$

$$= 84.4\,ft$$

Total Taut String Length = R + S = 45.8 + 84. = **130.2 ft = 39.7 m**

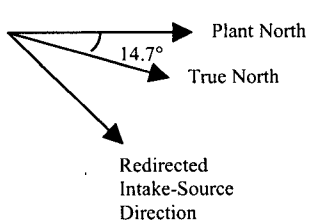
Redirected Direction from Intake B to the Northwest Corner of the Reactor Building = 26° from true north

$$\tan\theta = \frac{53.6}{61.5} = 0.8715$$

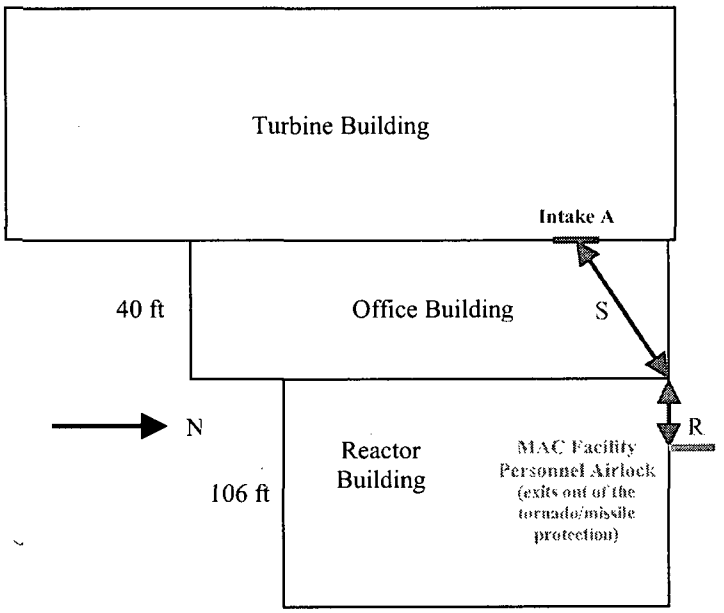
$\theta = 41.1°$ *from plant north*

$41.1° - 14.7° = 26.4°$ *from true north*

$\therefore 26°$ *from true north*



Calculation of Taut String Length
MAC Facility Personnel Airlock to Control Room HVAC Intake A



R = Slant distance MAC Facility Personnel Airlock to the top northeast corner of the Office Building

S = Slant distance from the top northeast corner of the Office Building to the Intake A

Vertical Center of the MAC Facility Personnel Airlock (tornado/missile protection) = 5.5 ft above grade (Drawing 3E-153-32-001, Revision 0)

Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

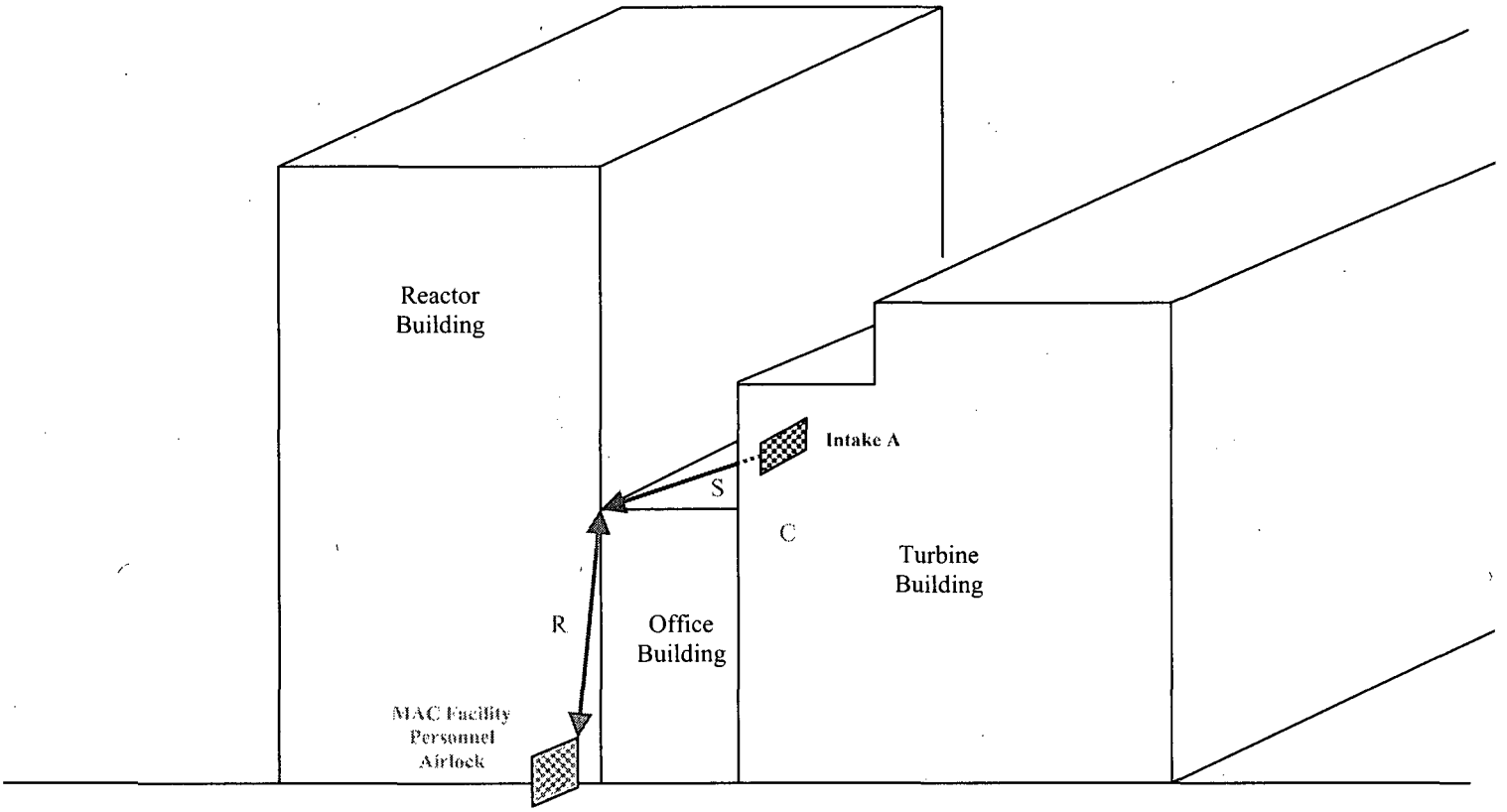
Plant east-west horizontal distance from the west wall of the Reactor Building to Intake A = 39.6 ft (Sketches from John Yuen, Item 5)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

Plant north-south distance from the northwest corner of the Office Building to Intake A = 38.25 ft (Sketches from John Yuen)

Plant east-west distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building = 2.1 ft (Drawing 3E-153-02-002, Revision 10)

Plant north-south distance from the MAC Facility Personnel Airlock to the north wall of the Reactor Building= 1.5 ft (Drawing 3E-153-32-001, Revision 0)



Calculation of Taut String Length
MAC Facility Personnel Airlock to Control Room HVAC Intake A

R = Slant Distance along the north face of the Reactor Building from the MAC Facility Personnel Airlock to the top northeast corner of the Office Building = 32.6 ft, calculated as follows:

Horizontal distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building =

$$\sqrt{(\text{Plant east - west distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building})^2 + ((\text{Plant north - south distance from the MAC Facility Personnel Airlock to the north wall of the Reactor Building}))^2}$$

$$= \sqrt{(2.1)^2 + (1.5)^2}$$

$$= \sqrt{6.66}$$

$$= 2.6\,ft$$

$$R = \sqrt{(\text{Horizontal distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building})^2 + ((\text{Office Building height - MAC Facility Personnel Airlock height}))^2}$$

$$= \sqrt{(2.6)^2 + (38 - 5.5)^2}$$

$$= \sqrt{1063}$$

$$= 32.6\,ft$$

S = Slant distance from the top northeast corner of the Office Building to Intake A = 55.5 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake A (along the Office Building Roof height) =

$$\sqrt{(\text{Plant east - west horizontal distance from the west wall of the Reactor Building to Intake A})^2 + (\text{Plant north - south horizintal distance from the northwest corner of the Office Building to Intake A})^2}$$

$$\sqrt{(39.6)^2 + (38.25)^2}$$

$$\sqrt{3031}$$

$$55.1\,ft$$

$$S = \sqrt{(\text{Intake A height above Office Building roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake A})^2}$$

$$= \sqrt{(45 - 38)^2 + (55.1)^2}$$

$$= \sqrt{3085}$$

$$= 55.5\,ft$$

Total Taut String Length = R + S = 32.6+ 55.5 = 88.1 ft = **26.9 m**

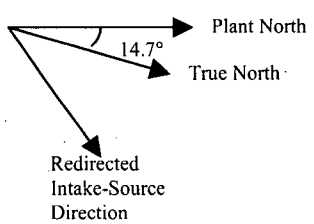
Redirected Direction from Intake A to the Northwest Corner of the Reactor Building = 31° from true north

$$\tan\theta = \frac{39.6}{38.25} = 1.0353$$

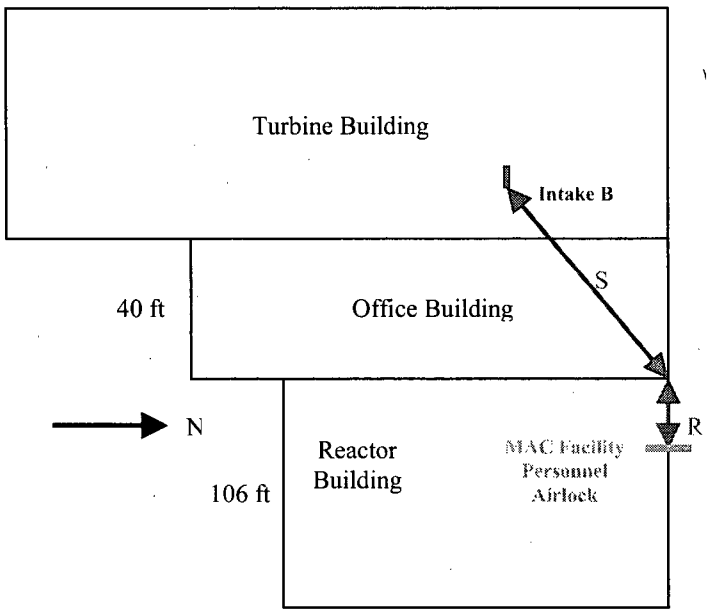
$\theta = 46°$ *from plant north*

$46° - 14.7° = 31.3°$ *from true north*

$\therefore 31°$ *from true north*



Calculation of Taut String Length
MAC Facility Personnel Airlock to Control Room HVAC Intake B



R = Slant distance from the MAC Facility Personnel Airlock to the top northeast corner of the Office Building

S = Slant distance from the top northeast corner of the Office Building to the Intake B

Vertical center of the MAC Facility Personnel Airlock (tornado/missile protection) height = 5.5 ft above grade (Drawing 3E-153-32-001, Revision 0)

Office Building height = 38 ft above grade (Sketches from John Yuen, Item 1)

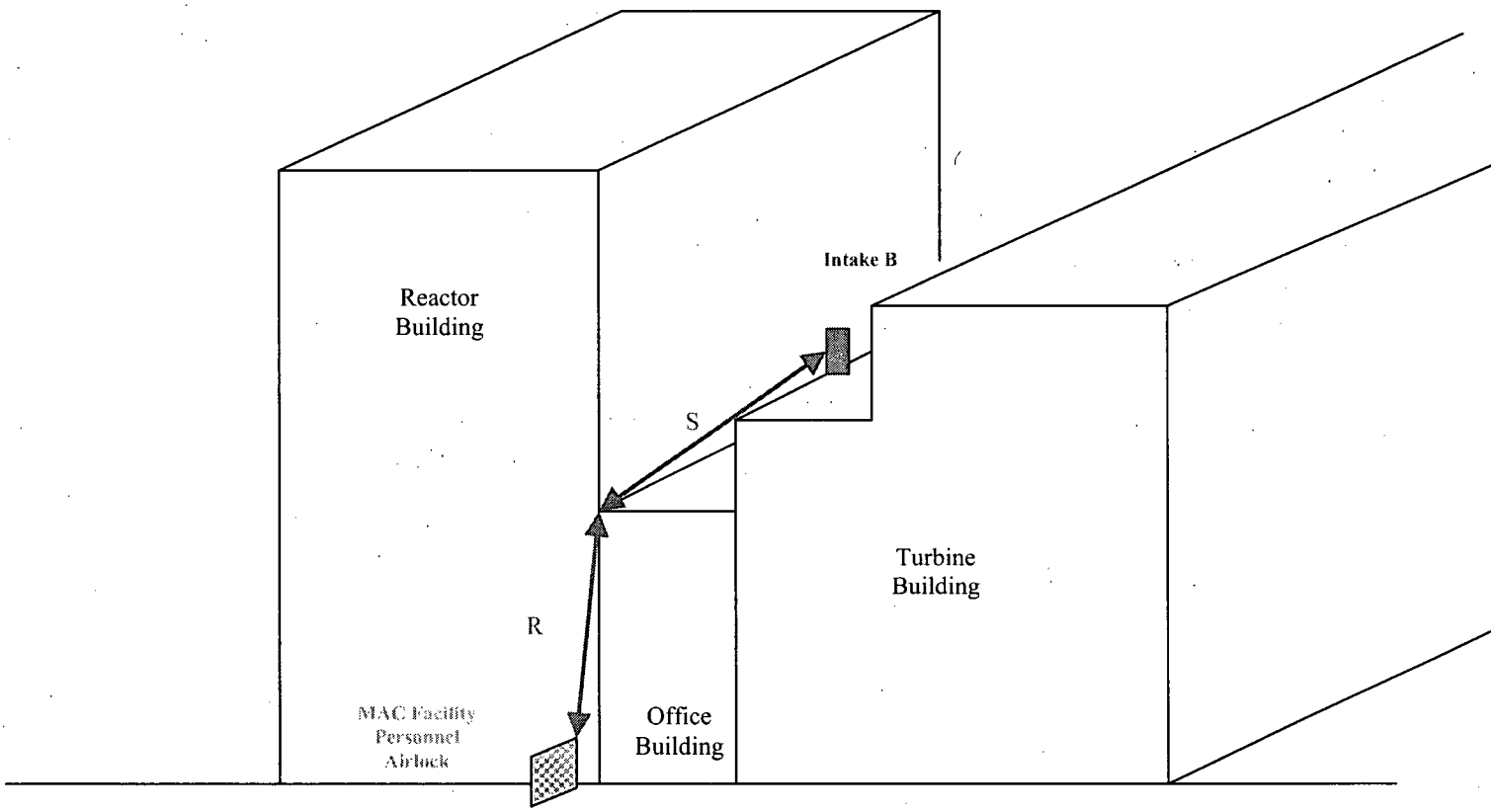
Plant east-west horizontal distance from the west wall of the Reactor Building to Intake B = 53.6 ft (Sketches from John Yuen, Item 5)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Plant north-south distance from the northwest corner of the Office Building to Intake B = 61.5 ft (Sketches from John Yuen, Item 6A)

Plant east-west distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building = 2.1 ft (Drawing 3E-153-02-002, Revision 10)

Plant north-south distance from the MAC Facility Personnel Airlock to the north wall of the Reactor Building= 1.5 ft (Drawing 3E-153-32-001, Revision 0)



Calculation of Taut String Length
MAC Facility Personnel Airlock to Control Room HVAC Intake B

R = Slant Distance along the north face of the Reactor Building from the MAC Facility Personnel Airlock to the top northeast corner of the Office Building = 32.6 ft, calculated as follows:

Horizontal distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building =

$$\sqrt{(\text{Plant east - west distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building})^2 + ((\text{Plant north - south distance from the MAC Facility Personnel Airlock to the north wall of the Reactor Building}))^2}$$

$$= \sqrt{(2.1)^2 + (1.5)^2}$$

$$= \sqrt{6.66}$$

$$= 2.6\,ft$$

$$R = \sqrt{(\text{Horizontal distance from the MAC Facility Personnel Airlock to the northwest corner of the Reactor Building})^2 + ((\text{Office Building height - MAC Facility Personnel Airlock height}))^2}$$

$$= \sqrt{(2.6)^2 + (38 - 5.5)^2}$$

$$= \sqrt{1063}$$

$$= 32.6\,ft$$

S = Slant distance from the top northeast corner of the Office Building to Intake B = 84.9 ft, calculated as follows:

Horizontal distance from the northeast corner of the Office Building to Intake B (along the Office Building Roof height)=

$$\sqrt{(\text{Plant east - west horizontal distance from the west wall of the Reactor Building to Intake B})^2 + (\text{Plant north - south distance from the northwest corner of the Office Building to Intake B})^2}$$

$$\sqrt{(53.6)^2 + (61.5)^2}$$

$$\sqrt{66551}$$

$$81.6\,ft$$

$$S = \sqrt{(\text{Intake B height above Office Building Roof})^2 + (\text{Horizontal distance from northeast corner of Office Building to Intake B})^2}$$

$$= \sqrt{(59.5 - 38)^2 + (81.6)^2}$$

$$= \sqrt{7121}$$

$$= 84.4\,ft$$

Total Taut String Length = R + S = 32.6 + 84.4 **=117.0 ft = 35.7 m**

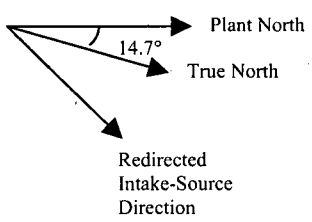
Redirected Direction from Intake B to the Northwest Corner of the Reactor Building = 26° from true north

$$\tan\theta = \frac{53.6}{61.5} = 0.8715$$

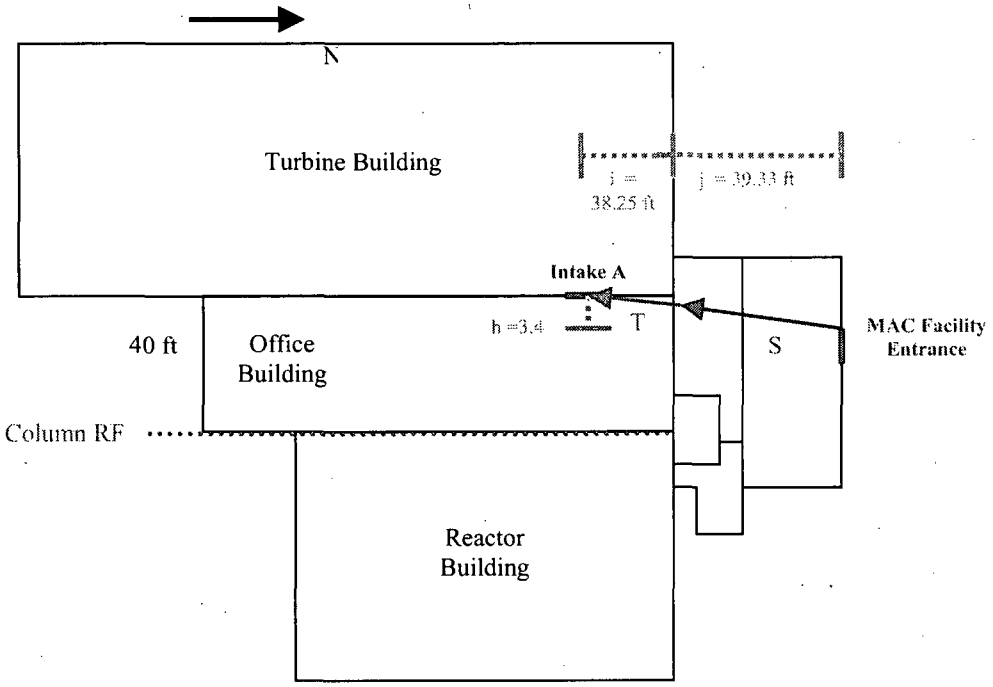
$\theta = 41.1°$ *from plant north*

$41.1° - 14.7° = 26.4°$ *from true north*

$\therefore 26°$ *from true north*

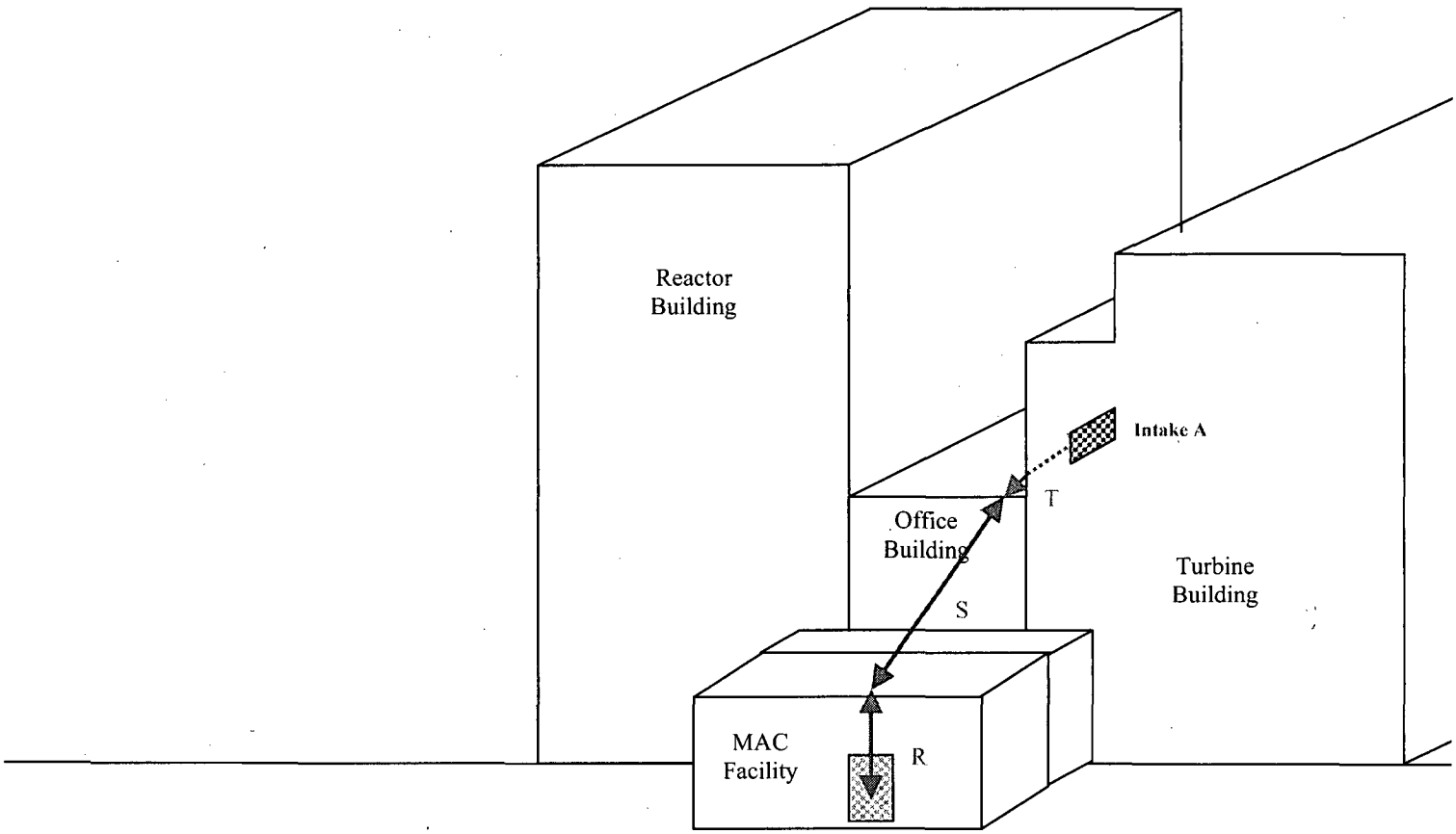


Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake A



Note: Drawing not to scale

Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake A



R = Distance from the MAC Facility Entrance to the MAC Facility Roof

S = Slant distance from the MAC Facility Roof to Office Building Roof

T = Slant distance from the Office Building Roof to Intake A

h = plant east-west horizontal distance from the MAC Facility Entrance to Intake A = 3.4ft (Sketches from Russell Smith and John Yuen)

i= plant north-south horizontal distance from the north wall of the Office Building to Intake A = 38.25 ft (Sketches from John Yuen, Item 6A)

j = plant north-south horizontal distance from the MAC Facility Entrance to the north wall of the Reactor Building = 39.33 ft (Sketch from Russell Smith)

Height of the MAC Facility Entrance = Vertical Center of the Doorway = 5.8 ft (Sketch from Russell Smith and 9/20/07 e-mail from Jessica DeLaRosa)

Height of the center of Intake A = 45 ft above grade (Sketches from John Yuen)

Height of the MAC Facility Roof = 170 in = 14.2 ft (e-mail from Russell Smith)

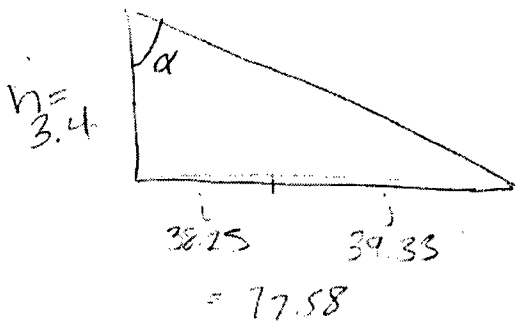
Office Building roof height = 38 ft above grade (Sketches from John Yuen, Item 1)

Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake A

Taut String Distance - MAC Facility Entrance to Intake A - page 1 of 2

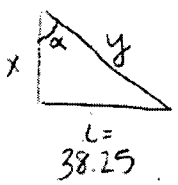
h = Vertical Distance from the MAC Facility Entrace to the MAC Facility Roof

= 14.2 - 5.8 = 8.4 ft



$\tan\alpha = \frac{77.58}{3.4} = 22.8176$

$\alpha = 87.5°$



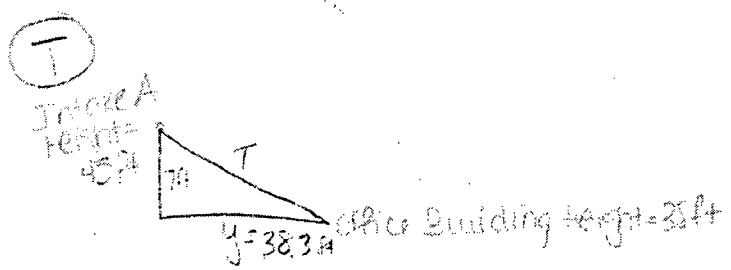
$\tan 87.5° = \frac{38.25}{x}$

$x = \frac{38.25}{\tan 87.5} = 1.7 ft$

$\sin 87.5° = \frac{38.25}{y}$

$y = \frac{38.25}{\sin 87.5°}$

$y = 38.3 ft$

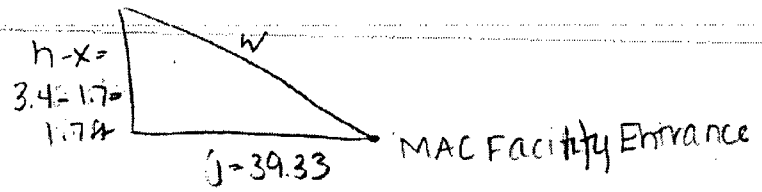


$T = \sqrt{38.3^2 + 7^2}$

$T = 38.9 ft$

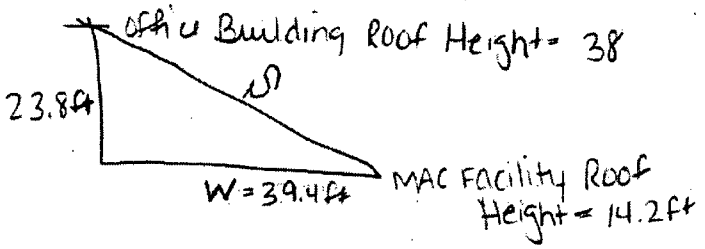
Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake A

Taut String Distance - MAC Facility Entrance to Intake A - page 2 of



$W = \sqrt{1.7^2 + 39.33^2}$

$W = 39.4ft$

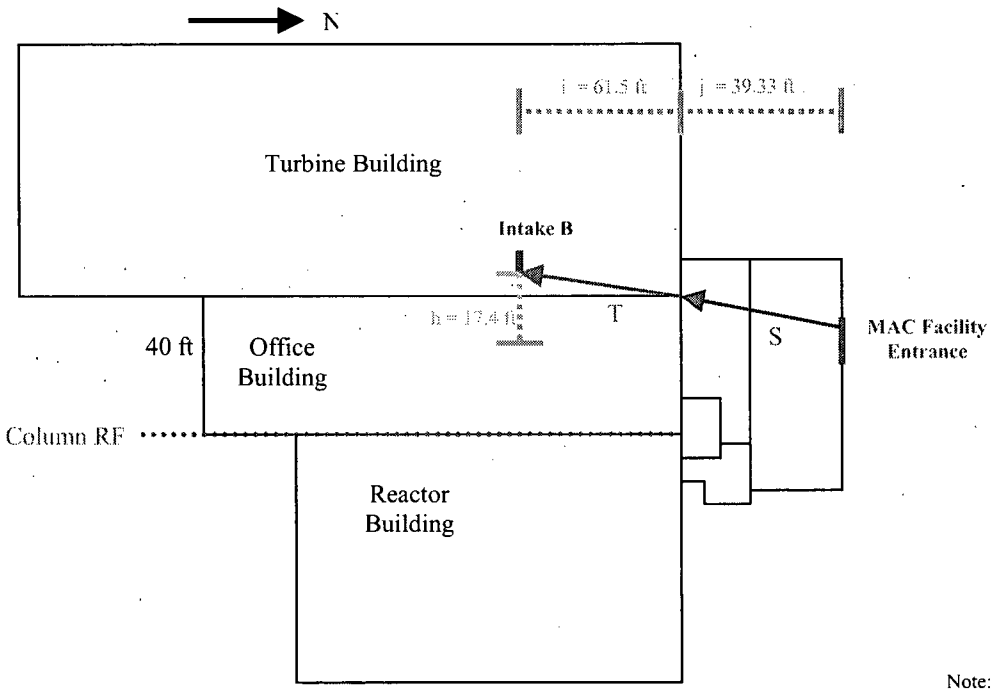


$S = \sqrt{23.8^2 + 39.4^2}$

$S = 46ft$

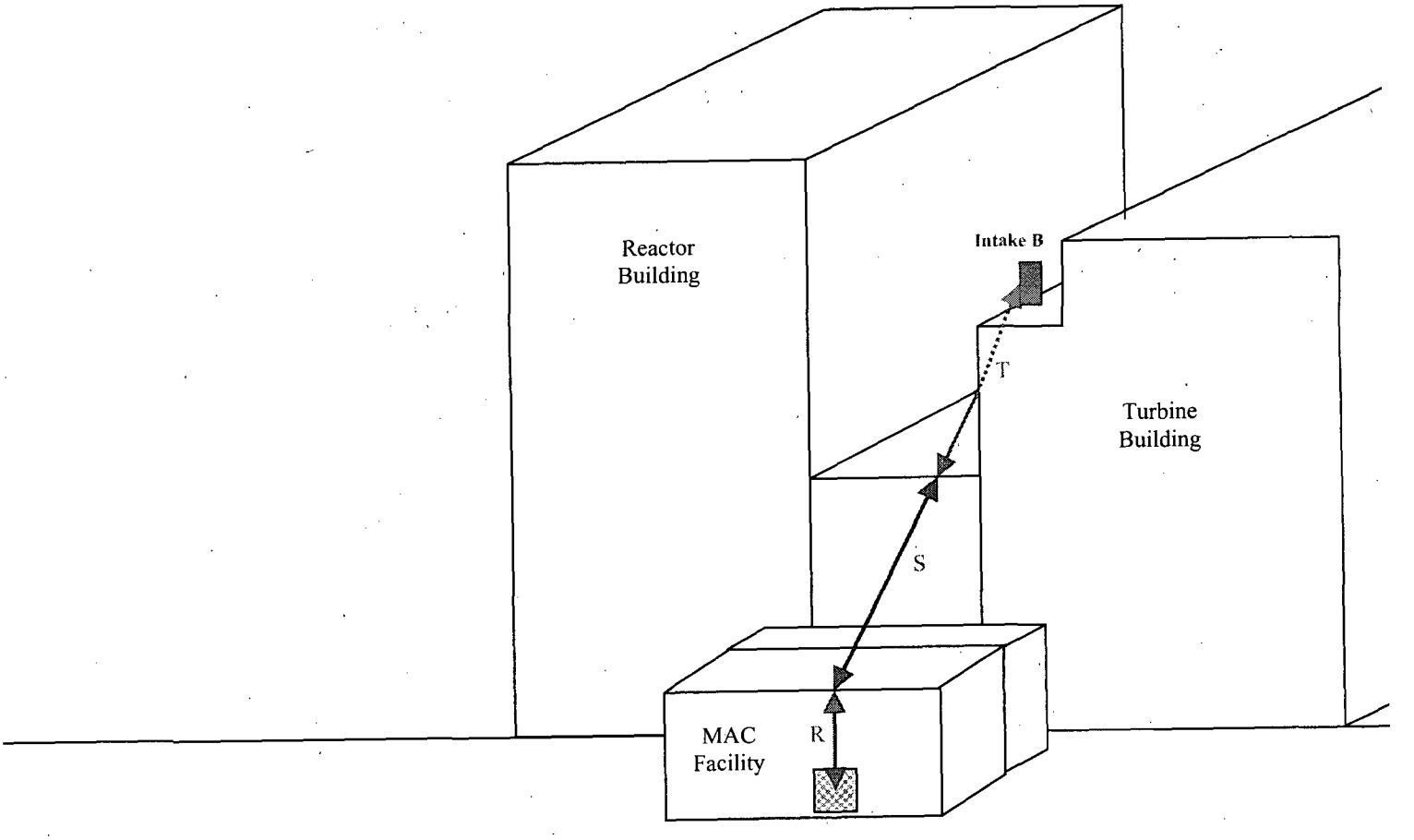
Total Taut String = R+S+T
= 8.4 + 46 + 38.9
= 93.3 ft = 28.4 m

Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake B



Note: Drawing not to scale

Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake B



R = Distance from the MAC Facility Entrance to the MAC Facility Roof

S = Slant distance from the MAC Facility Roof to Office Building Roof

T = Slant distance from the Office Building Roof to Intake B

h = plant east-west horizontal distance from the MAC Facility Entrance to Intake B = 17.4 ft (Sketches from Russell Smith and John Yuen)

i= plant north-south horizontal distance from the north wall of the Office Building to Intake B = 62.15 ft (Sketches from John Yuen, Item 6A)

j = plant north-south horizontal distance from the MAC Facility Entrance to the north wall of the Reactor Building = 39.33 ft (Sketch from Russell Smith)

Height of the center of Intake B = ((63 – 56)/2) + 56 = 59.5 ft above grade (Sketches from John Yuen, Item 9)

Office Building roof height = 38 ft above grade (Sketches from JohnYuen, Item 1)

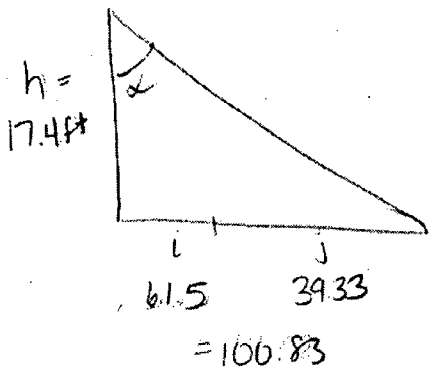
Height of the MAC Facility Roof = 170 in = 14.2 ft (e-mail from Russell Smith)

Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake B

Taut String Distance - MAC Facility Entrance to Intake B - pg 1 of 2

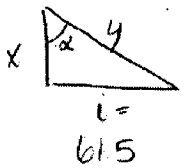
R = Vertical Distance from the MAC Facility Entrance to the MAC Facility Roof

$= 14.2 - 5.8 = 8.4$ ft



$\tan\alpha = \frac{100.83}{17.4} = 5.7948$

$\alpha = 80.2°$



$\tan 80.2 = \frac{61.5}{x}$

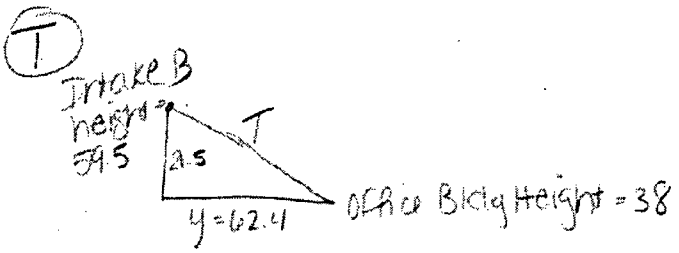
$x = \frac{61.5}{\tan 80.2}$

$x = 10.6$ ft

$\sin 80.2 = \frac{61.5}{y}$

$y = \frac{61.5}{\sin 80.2}$

$y = 62.4$ ft

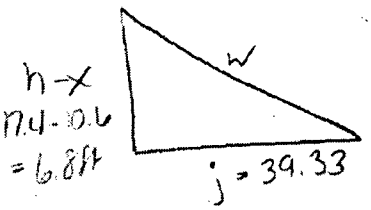


$T = \sqrt{21.5^2 + 62.4^2}$

$T = 66$ ft

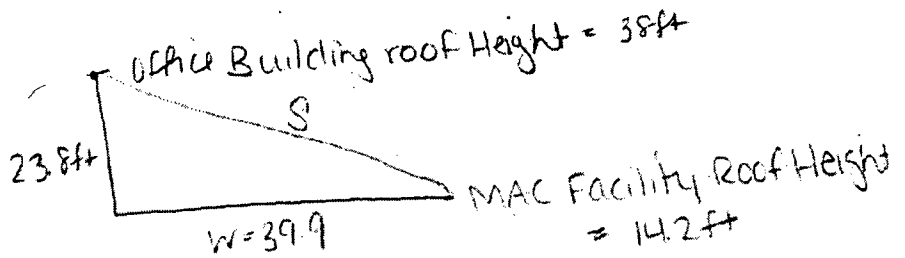
Calculation of Taut String Length
MAC Facility Entrance to Control Room HVAC Intake B

Taut String Distance - MAC Facility Entrance to Intake B - pg 2 of 2



$w = \sqrt{6.8^2 - 39.33^2}$

$w = 39.9$ ft



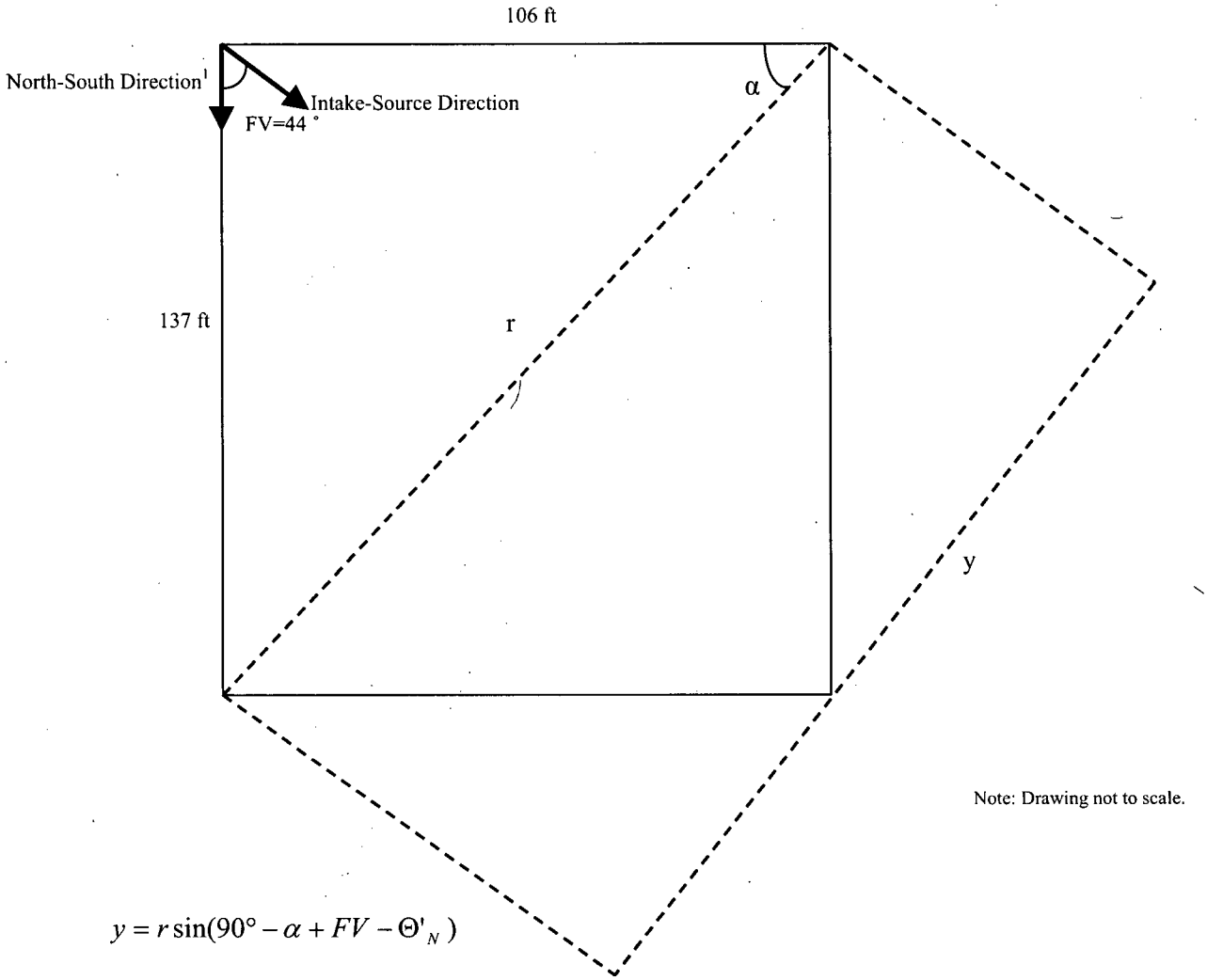
$S = \sqrt{23.8^2 + 39.9^2}$

$S = 46.5$ ft

Total Taut string Length = R + S + T
= 8.4 + 46.5 + 66
= 120.9 ft = 36.9 m

Projected Area of the Reactor Building

Scenario: Reactor Building Roof Hatch to Control Room HVAC Intake A



$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 136° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) \doteq .7919 \qquad \therefore \alpha = 52°$
- $FV = 44°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 44° - 0°)$$
$$y = 173\sin(82°)$$
$$y = 171.3\,ft$$

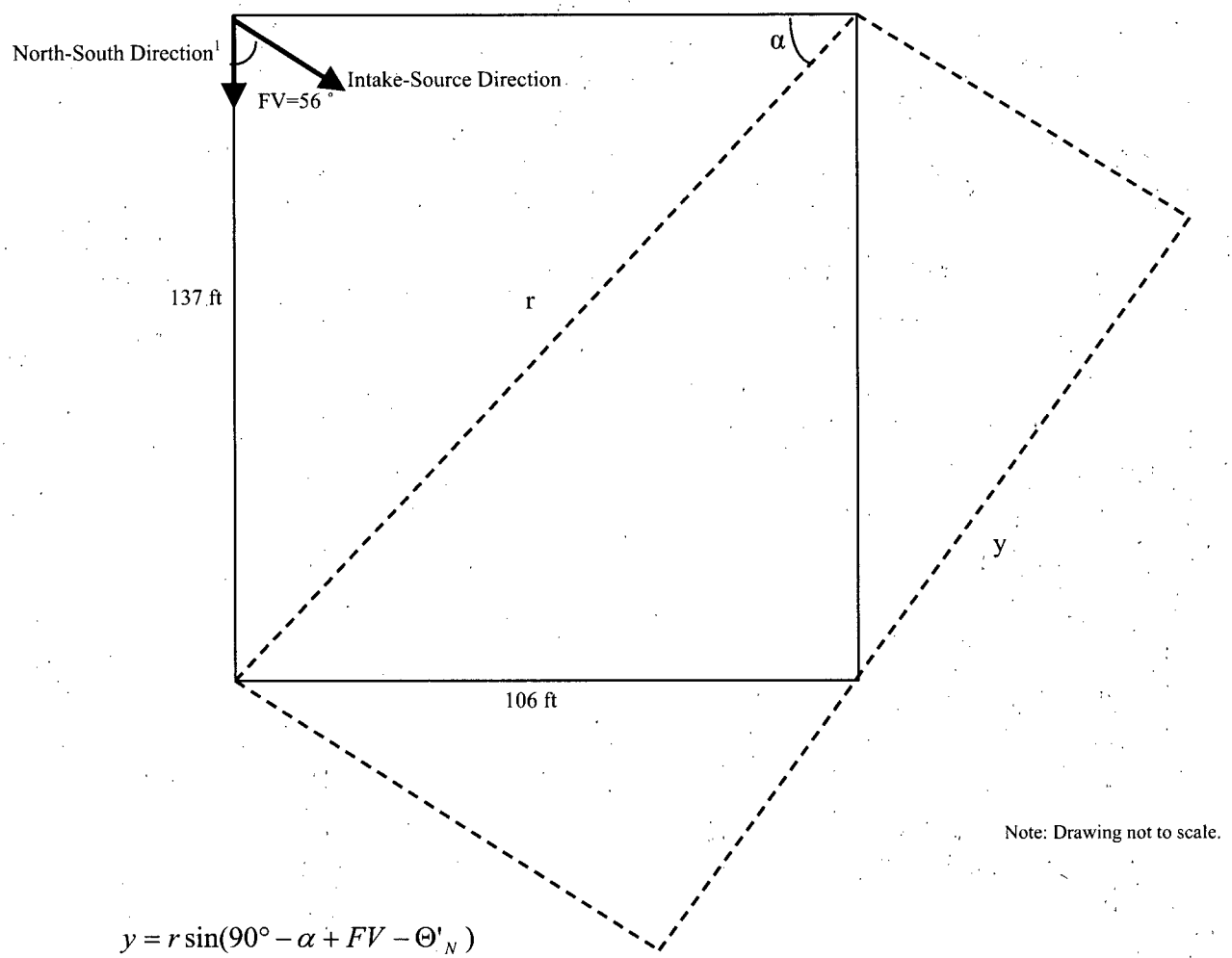
Projected Width = 171.3 ft

Projected Area of Reactor Building = (146)(171.3) = 25009.8 ft^2 = 2323 m^2

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Reactor Building Roof Hatch to Control Room HVAC Intake B



$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 124° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 56°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 56° - 0°)$$
$$y = 173\sin(94°)$$
$$y = 172.6\,ft$$

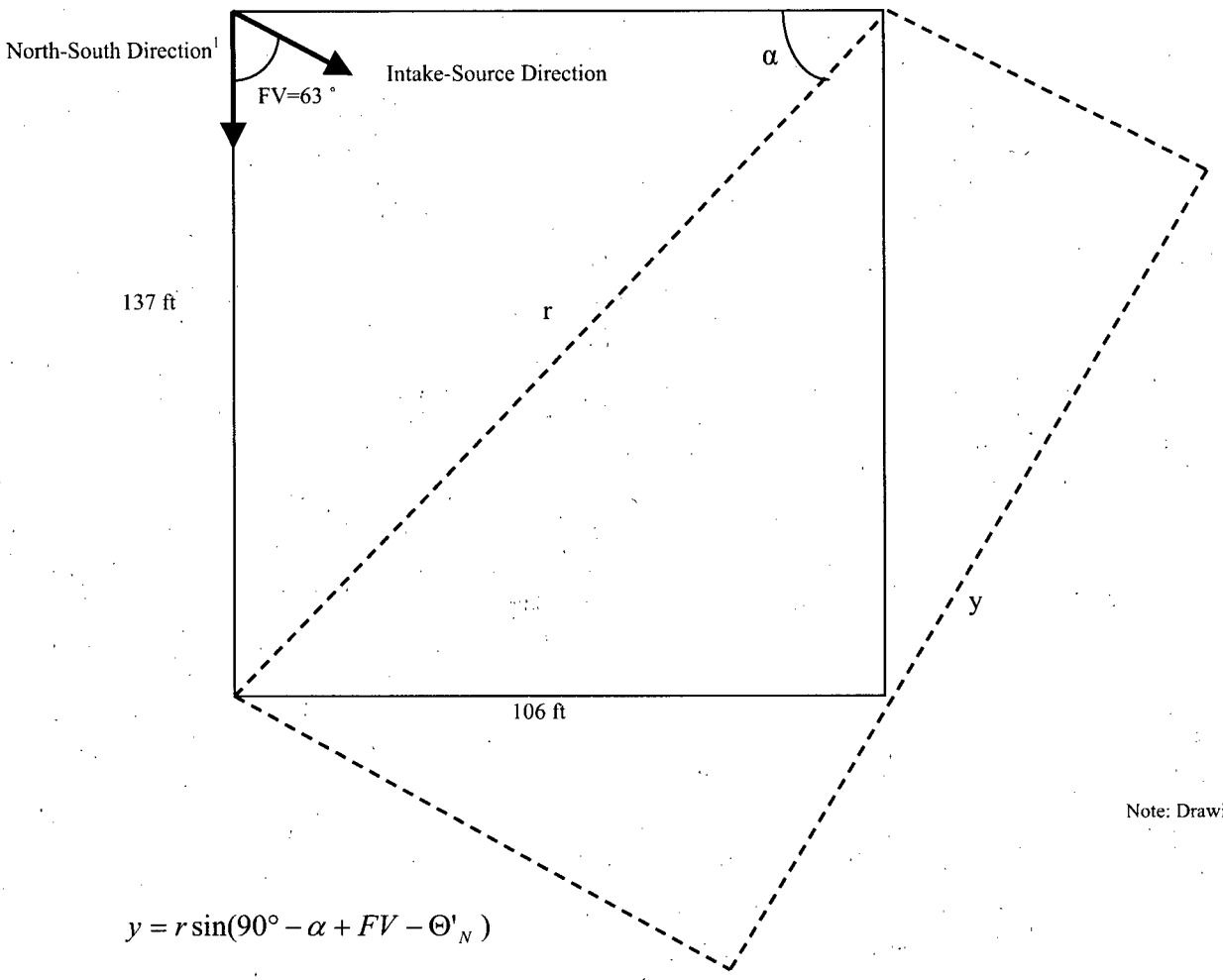
Projected Width = 172.6 ft

Projected Area of Reactor Building = (146)(172.6) = 25199.6 ft^2 = **2341 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Stack Tunnel Door to Control Room HVAC Intake A



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 117° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 63°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 63° - 0°)$$
$$y = 173\sin(101°)$$
$$y = 169.8\,ft$$

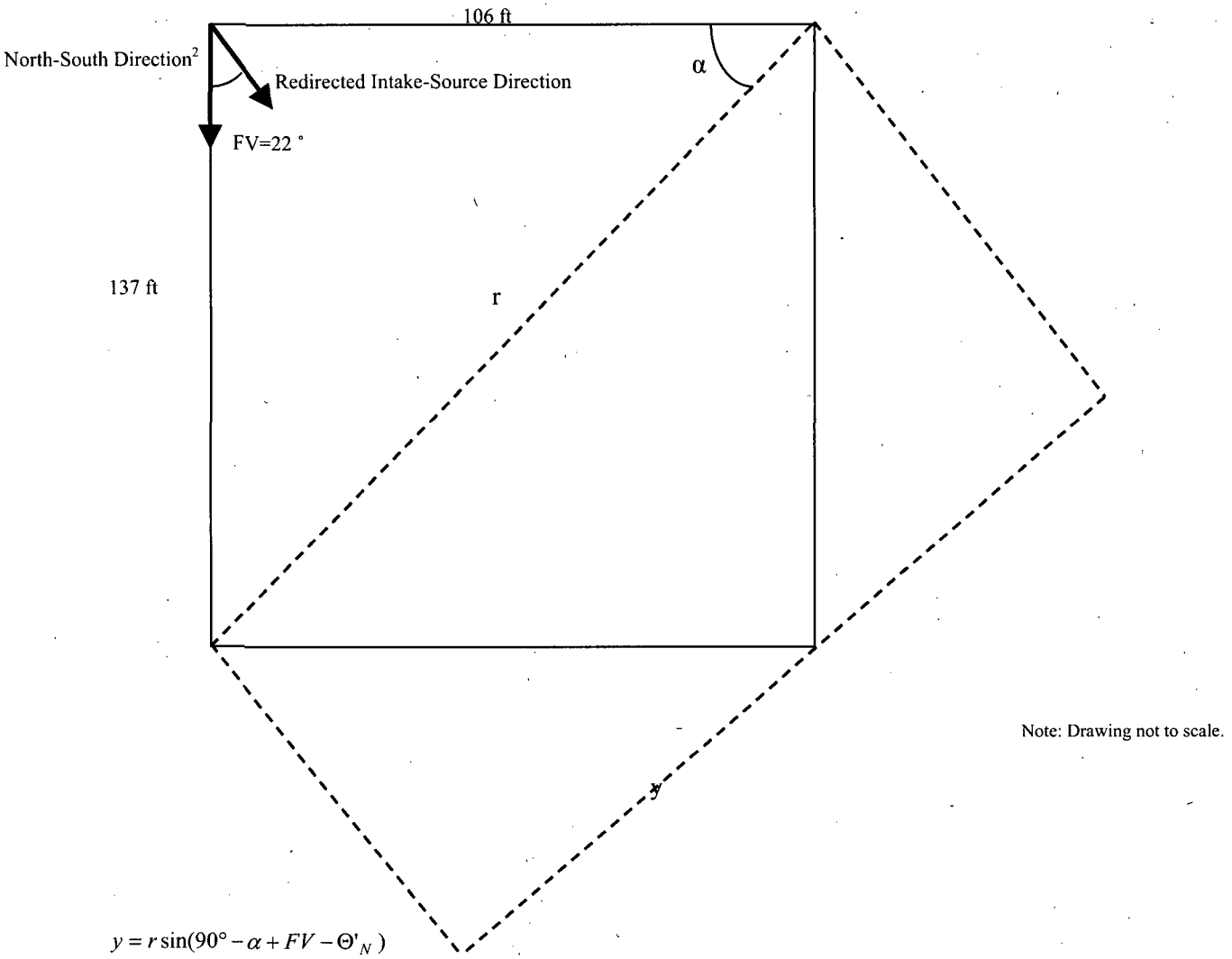
Projected Width = 169.8 ft

Projected Area of Reactor Building = (146)(169.8) = 24790.8 ft^2 = **2303 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Stack Tunnel Door to Control Room HVAC Intake A (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 158° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 22°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 22° - 0°)$

$y = 173\sin(60°)$

$y = 149.8\,ft$

Redirected Projected Width = 149.8 ft

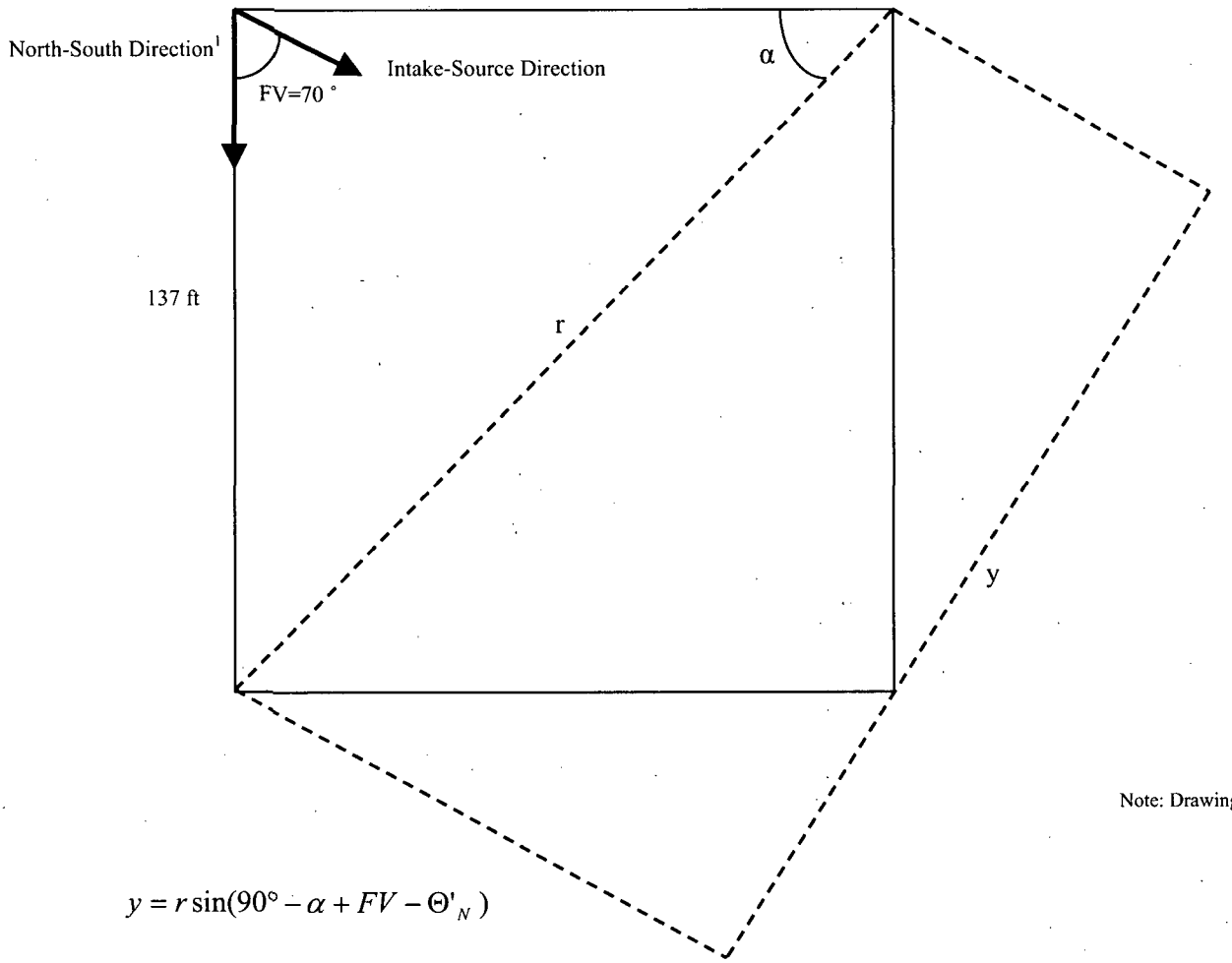
Redirected Projected Area of Reactor Building = (146)(149.8) = 21870.8 ft^2 = **2032 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Stack Tunnel Door to Control Room HVAC Intake B



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 110° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 70°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 70° - 0°)$$
$$y = 173\sin(108°)$$
$$y = 164.5\,ft$$

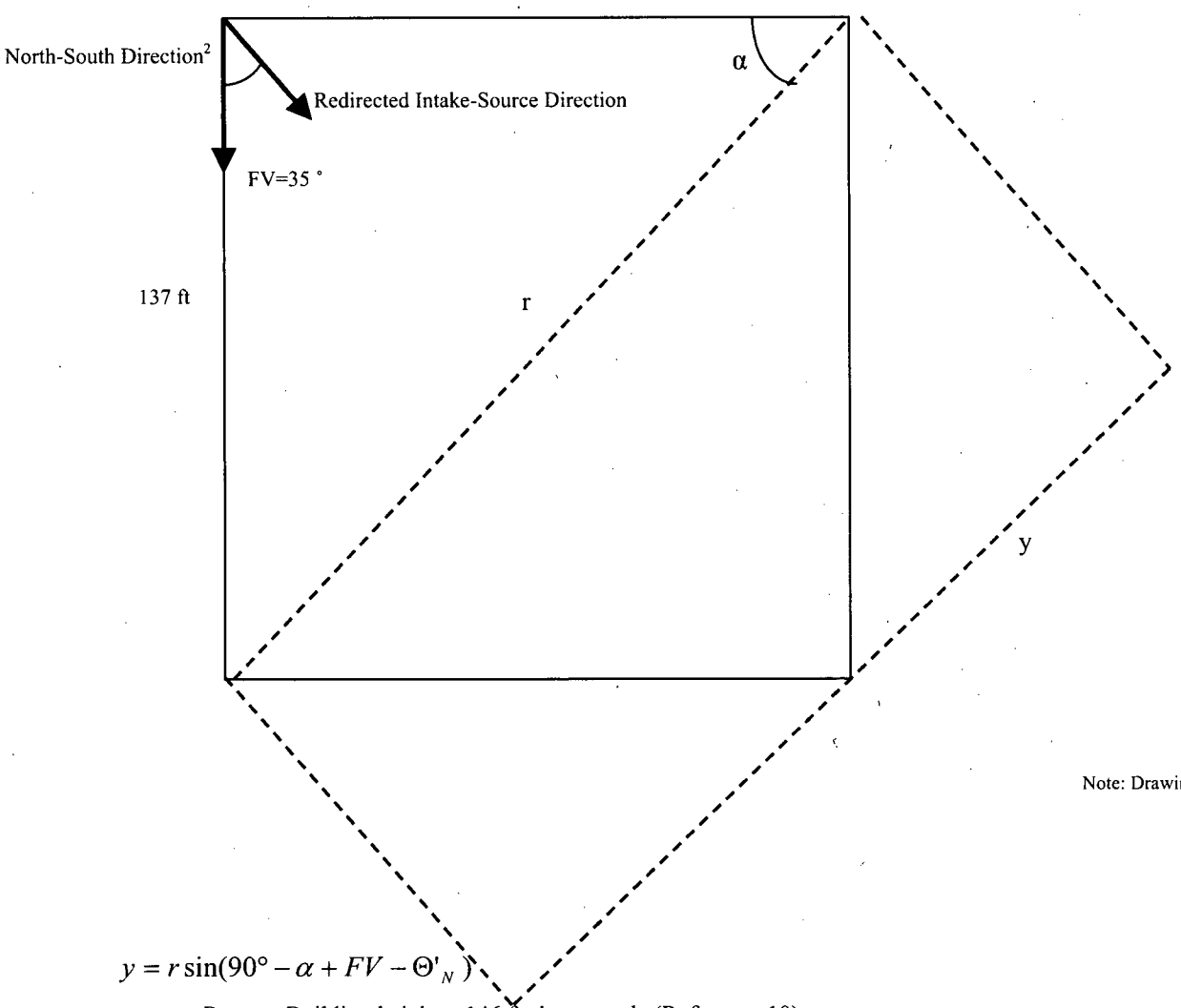
Projected Width = 164.5 ft

Projected Area of Reactor Building = (146)(164.5) = 24017 ft^2 = **2231 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Stack Tunnel Door to Control Room HVAC Intake B (Redirected Flow[1])



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 145° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 35°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 35° - 0°)$$
$$y = 173\sin(73°)$$
$$y = 165.4\,ft$$

Redirected Projected Width = 165.4 ft

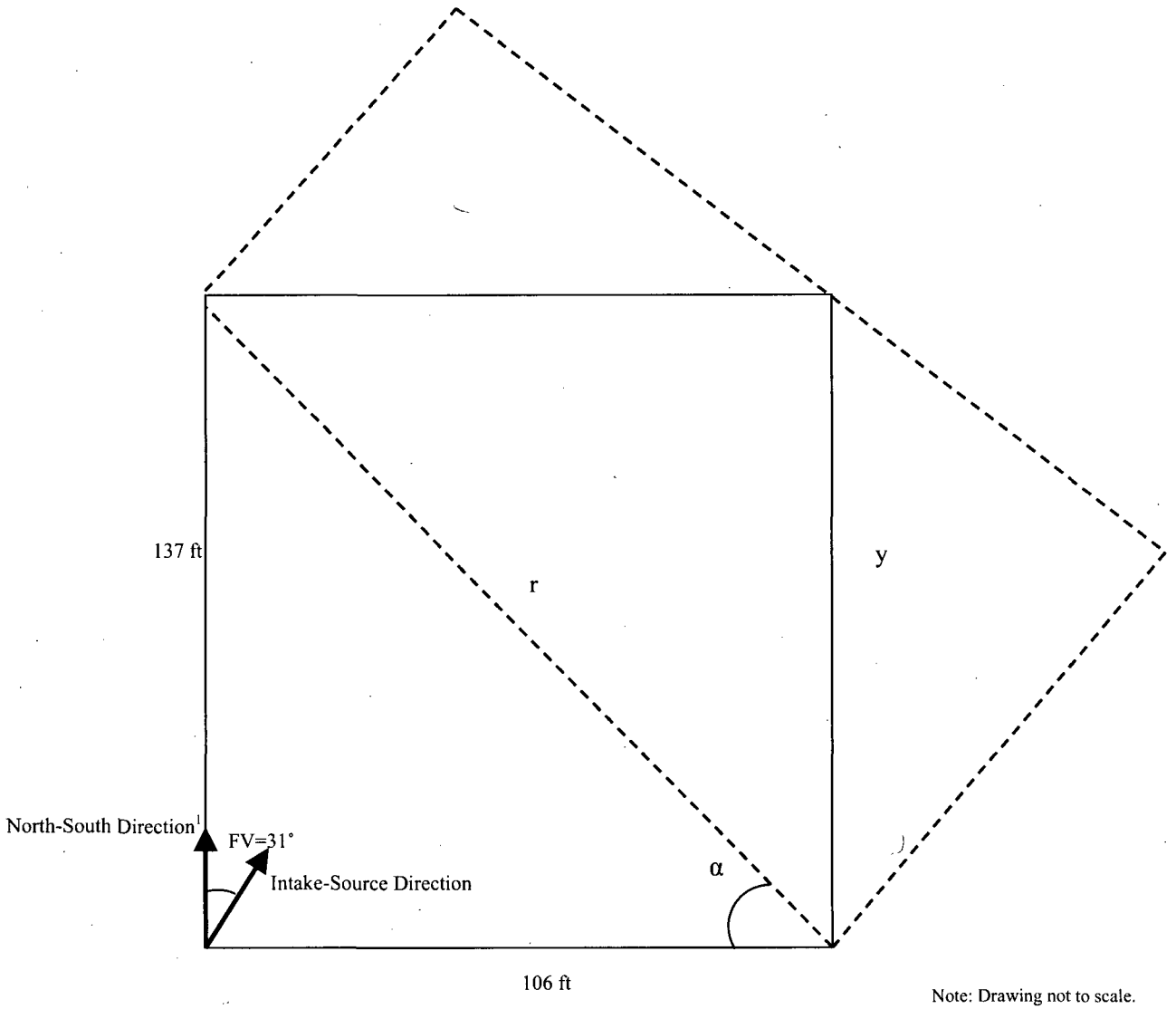
Redirected Projected Area of Reactor Building = (146)(165.4) = 24148.4 ft^2 = **2244 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: D/W Access Facility (West Wall) to Control Room HVAC Intake A



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 31° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 31°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 31° - 0°)$

$y = 173\sin(69°)$

$y = 161.5\,ft$

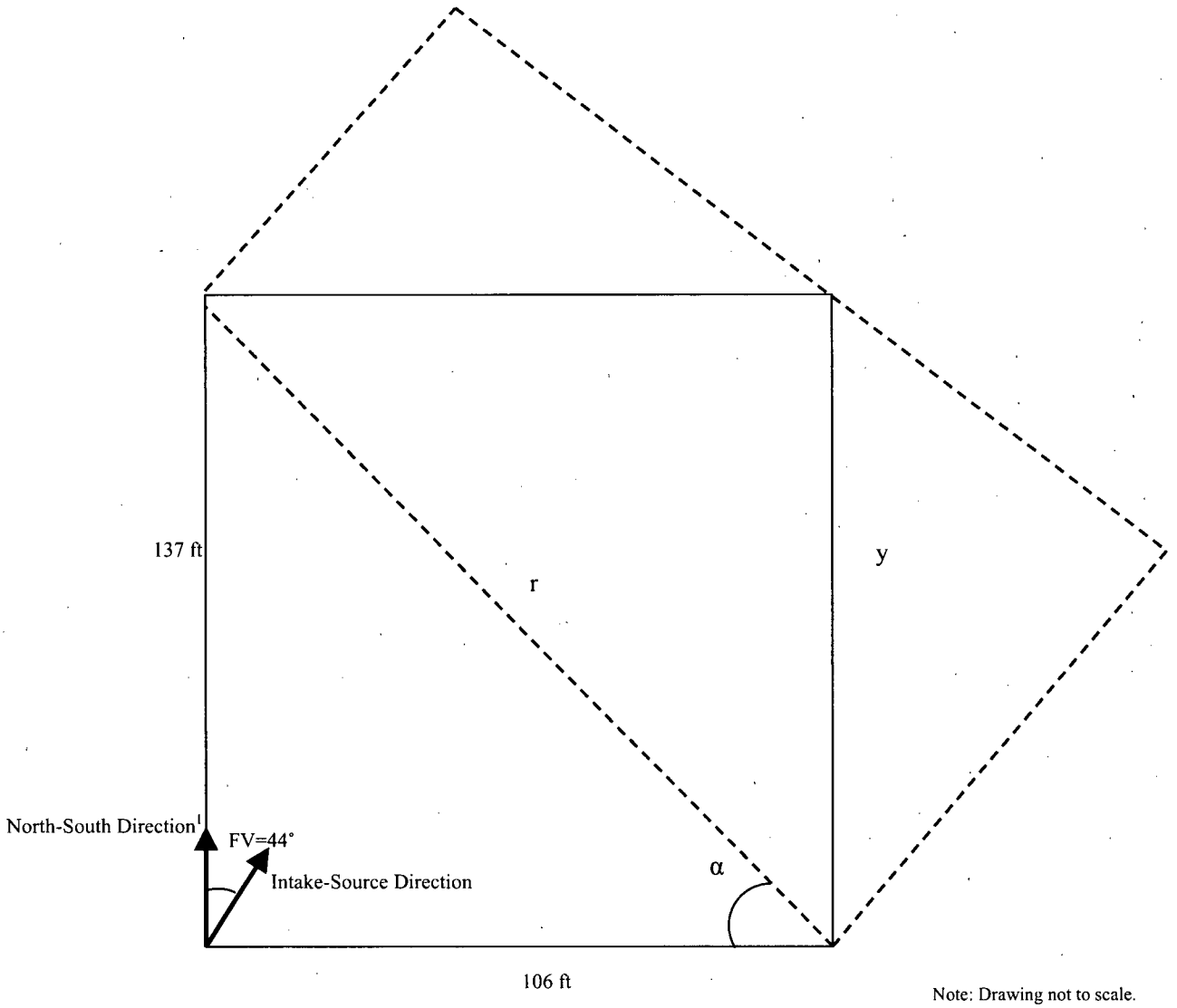
Projected Width = 161.5 ft

Projected Area of Reactor Building = (146)(161.5) = 23579 ft^2 = **2191 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: D/W Access Facility (South Wall) to Control Room HVAC Intake A



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 44° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 44°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 44° - 0°)$

$y = 173\sin(82°)$

$y = 171.3\,ft$

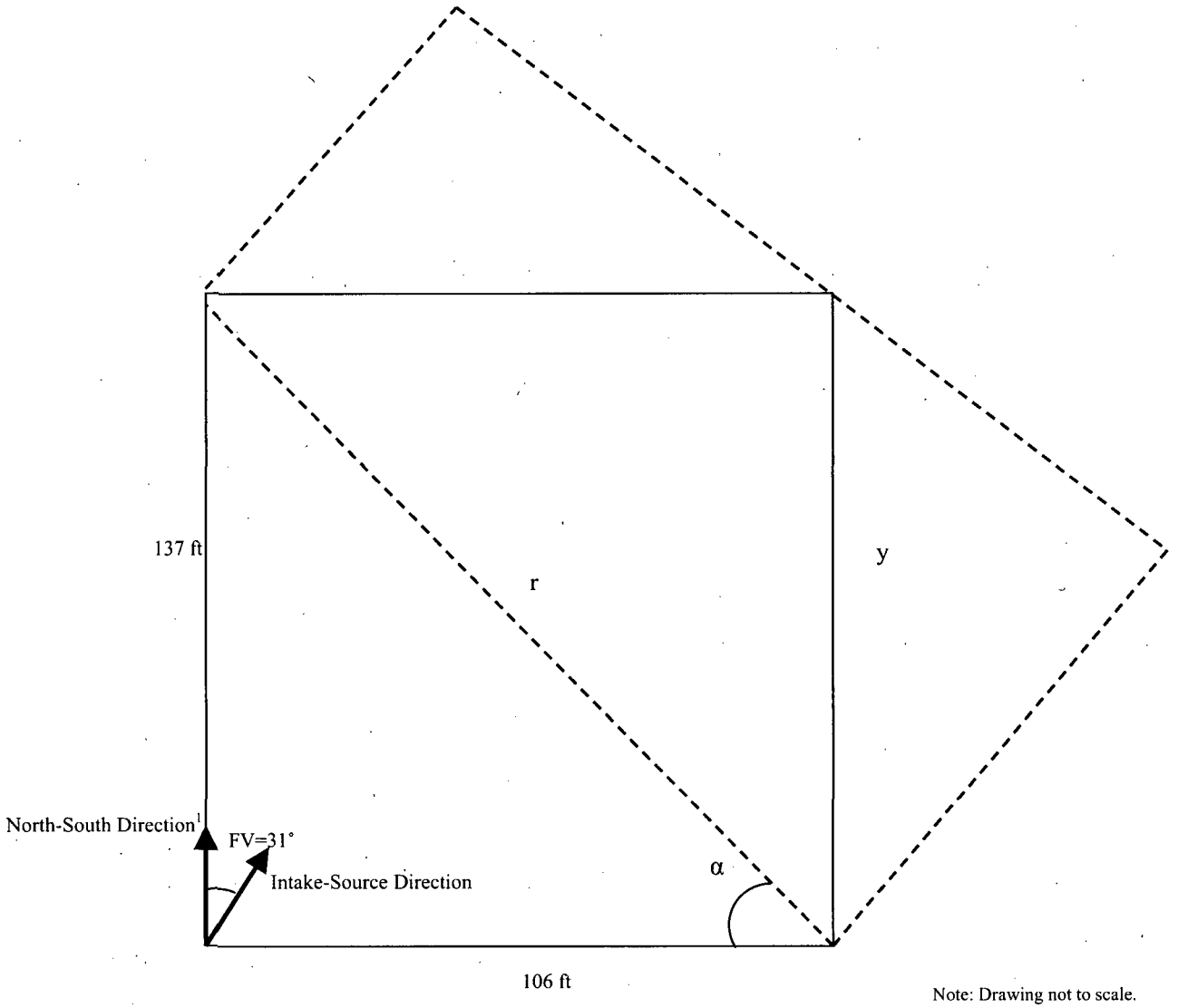
Projected Width = 171.3 ft

Projected Area of Reactor Building = (146)(171.3) = 25009.8 ft^2 = **2324 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: D/W Access Facility (West Wall) to Control Room HVAC Intake B



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 31° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 31°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 31° - 0°)$

$y = 173\sin(69°)$

$y = 161.5\,ft$

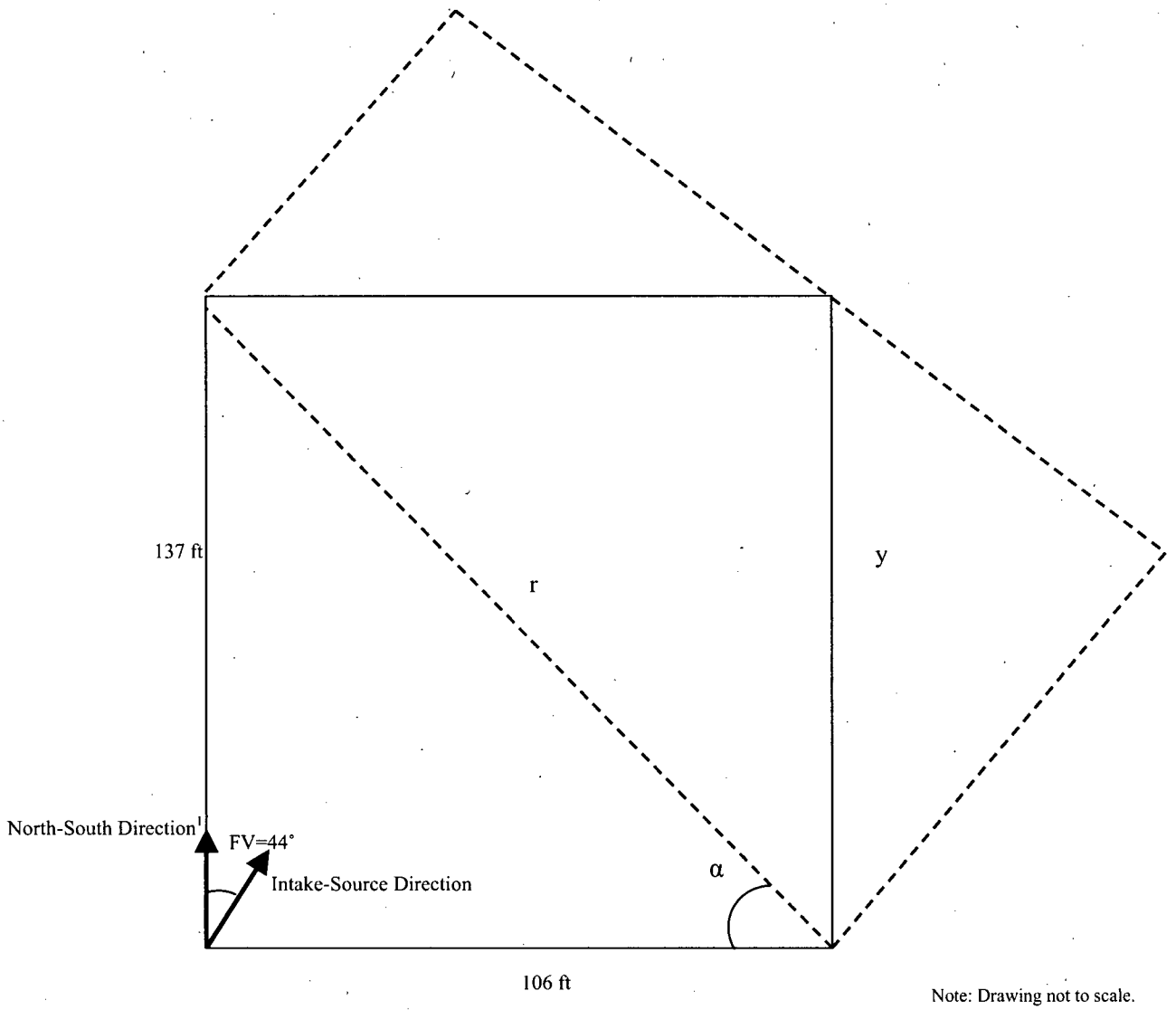
Projected Width = 161.5 ft

Projected Area of Reactor Building = (146)(161.5) = 23579 ft^2 = **2191 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: D/W Access Facility (South Wall) to Control Room HVAC Intake B



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 42° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 31°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 42° - 0°)$

$y = 173\sin(80°)$

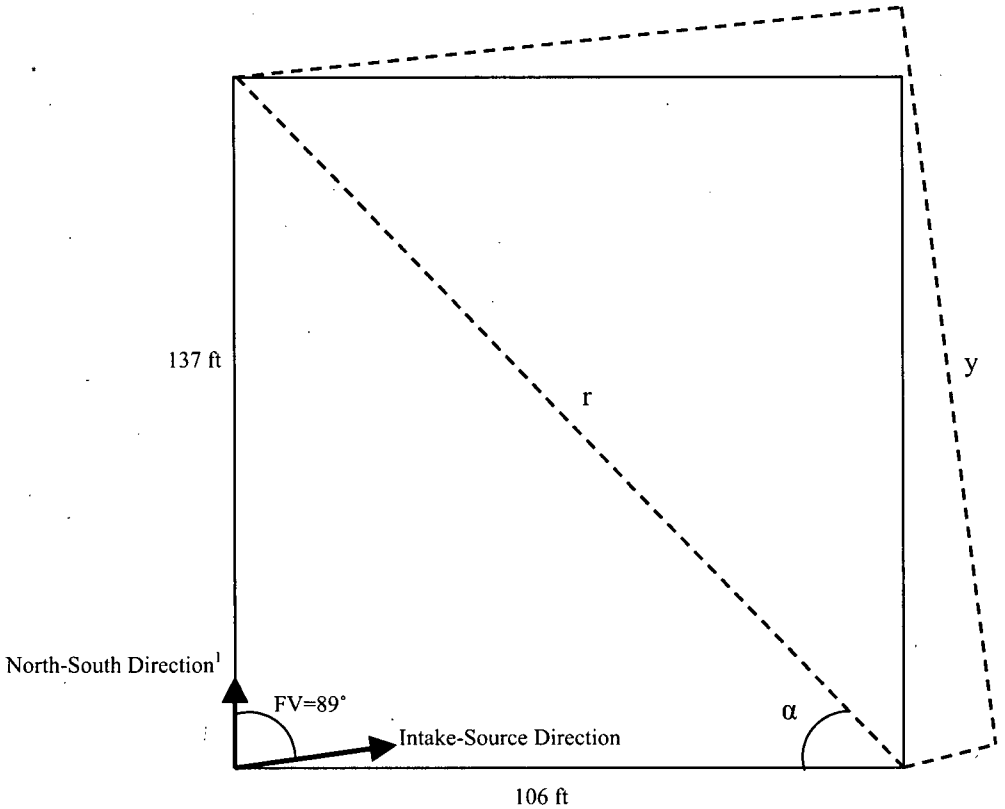
$y = 170.4\,ft$

Projected Width = 170.4ft

Projected Area of Reactor Building = (146)(170.4) = 24878.4 ft^2 = **2311 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building
Scenario: East Airlock Door to Control Room HVAC Intake A



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 89° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 89°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52° + 89° - 0°)$$
$$y = 173\sin(127°)$$
$$y = 138.2\,ft$$

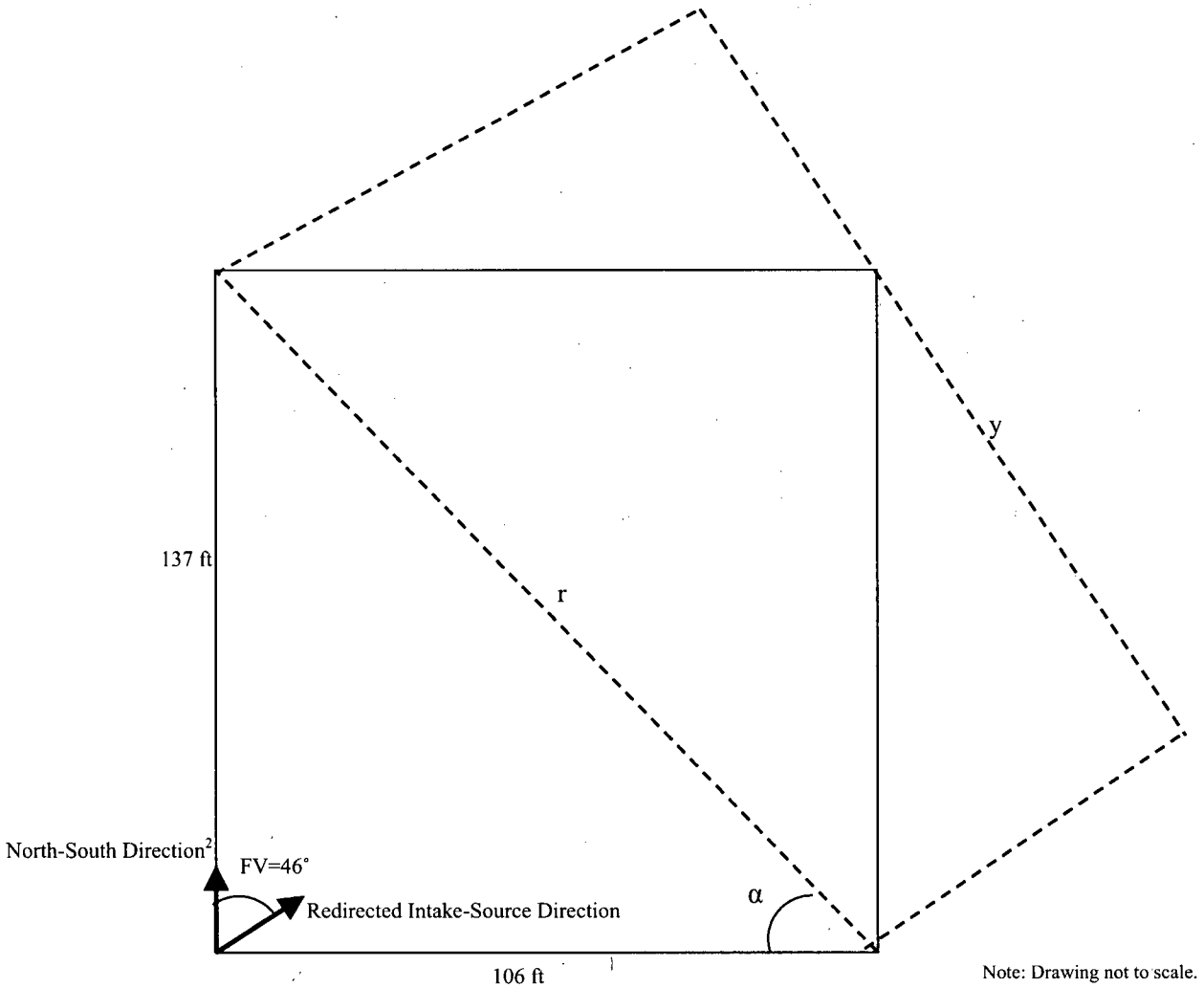
Projected Width = 138.2 ft

Projected Area of Reactor Building = (146)(138.2) = 20177.2 ft^2 = **1875 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: East Airlock Door to Control Room HVAC Intake A (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 46° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 46°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 46° - 0°)$

$y = 173\sin(84°)$

$y = 172.1\,ft$

Redirected Projected Width = 172.1 ft

Redirected Projected Area of Reactor Building = (146)(172.1) = 25126.6 ft^2 = **2334 m^2**

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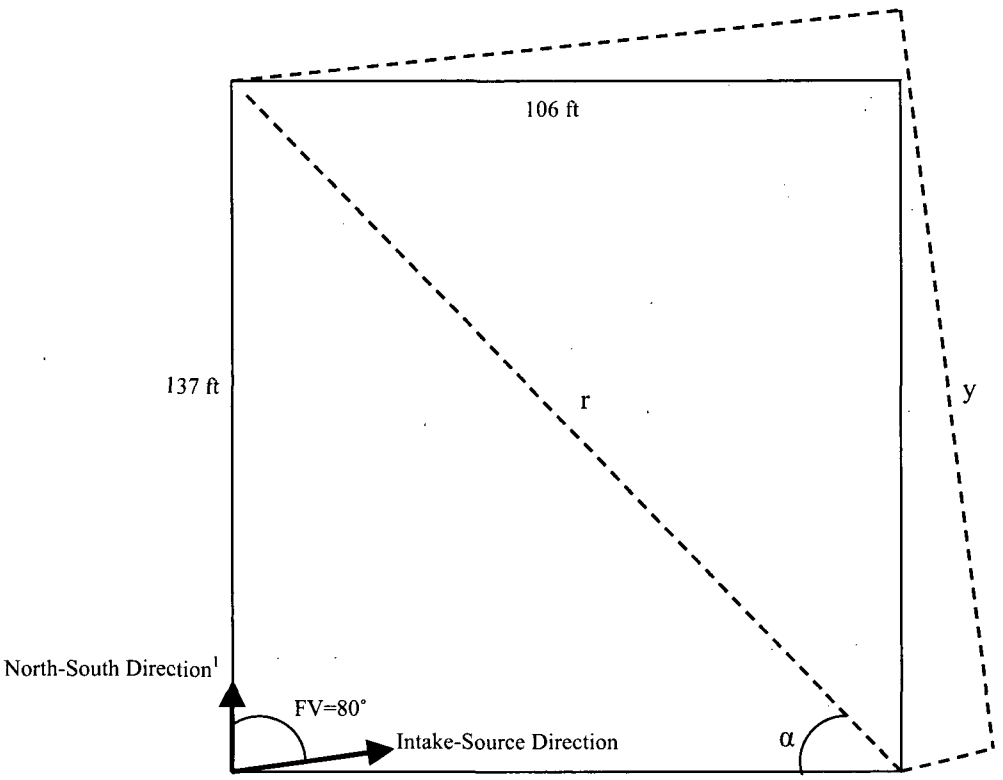
[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: East Airlock Door to Control Room HVAC Intake B



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 80° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 80°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 80° - 0°)$$
$$y = 173\sin(118°)$$
$$y = 152.7\,ft$$

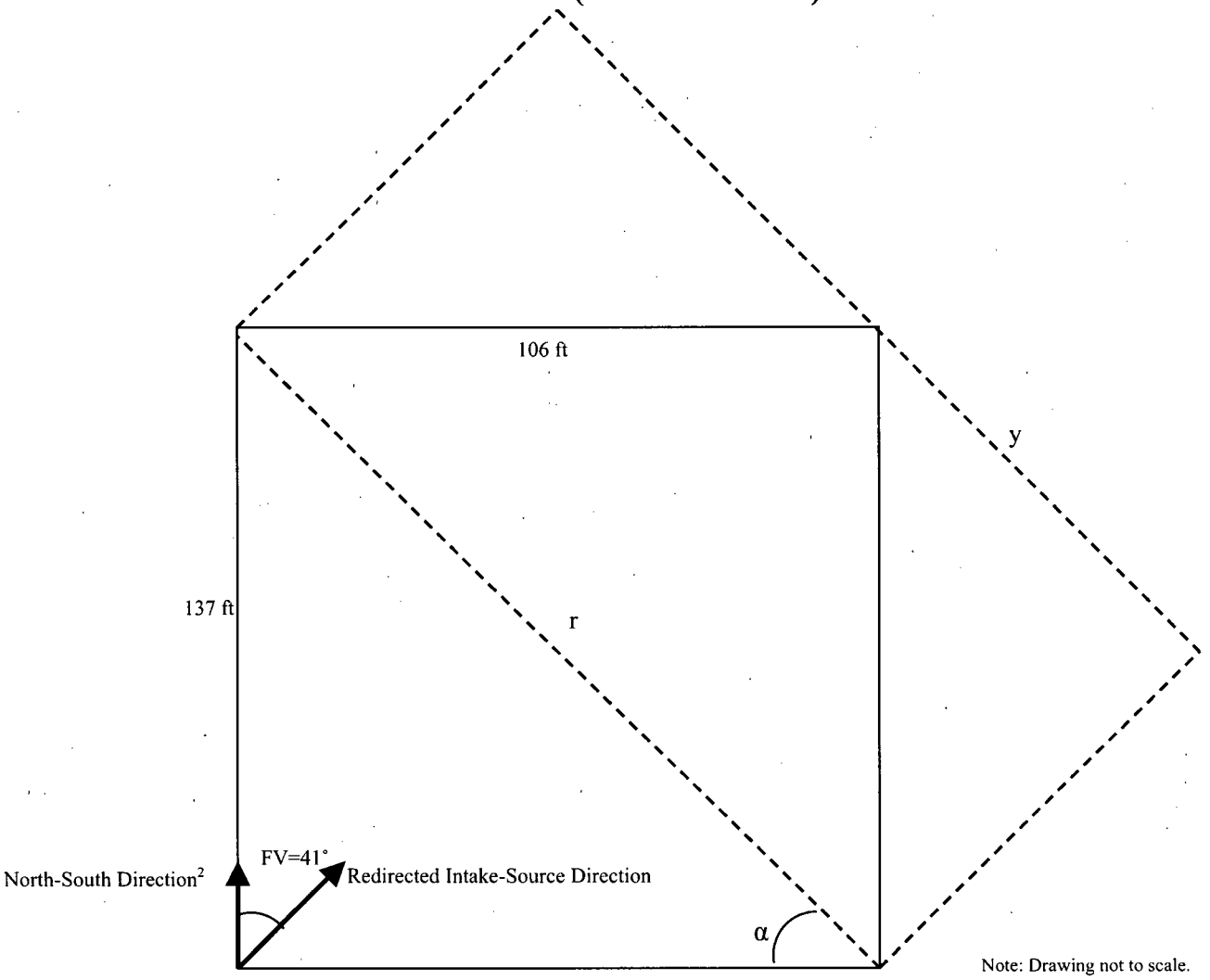
Projected Width = 152.7 ft

Projected Area of Reactor Building = (146)(152.7) = 22294.2 ft^2 = **2071 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Alternate Projected Area of the Reactor Building[1]

Scenario: East Airlock Door to Control Room HVAC Intake B (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 41° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 41°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52 + 41° - 0°)$

$y = 173\sin(79°)$

$y = 169.8\,ft$

Redirected Projected Width = 169.8 ft

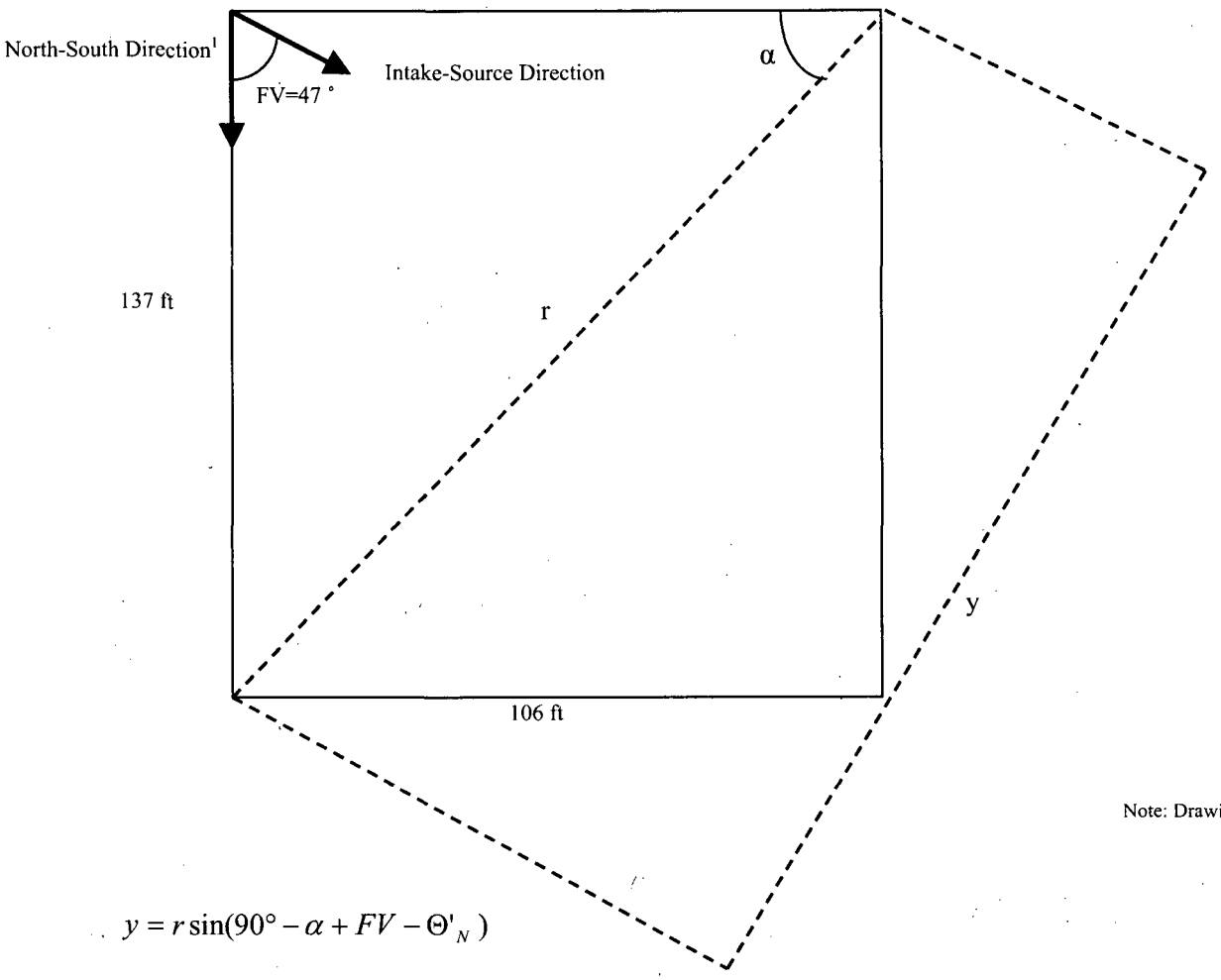
Redirected Projected Area of Reactor Building = (146)(169.8) = 24790.8 ft^2 = **2303 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration (10b) on Reactor Building South Wall to Control Room HVAC Intake A



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 133° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 47°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 47° - 0°)$$
$$y = 173\sin(85°)$$
$$y = 172.3\,ft$$

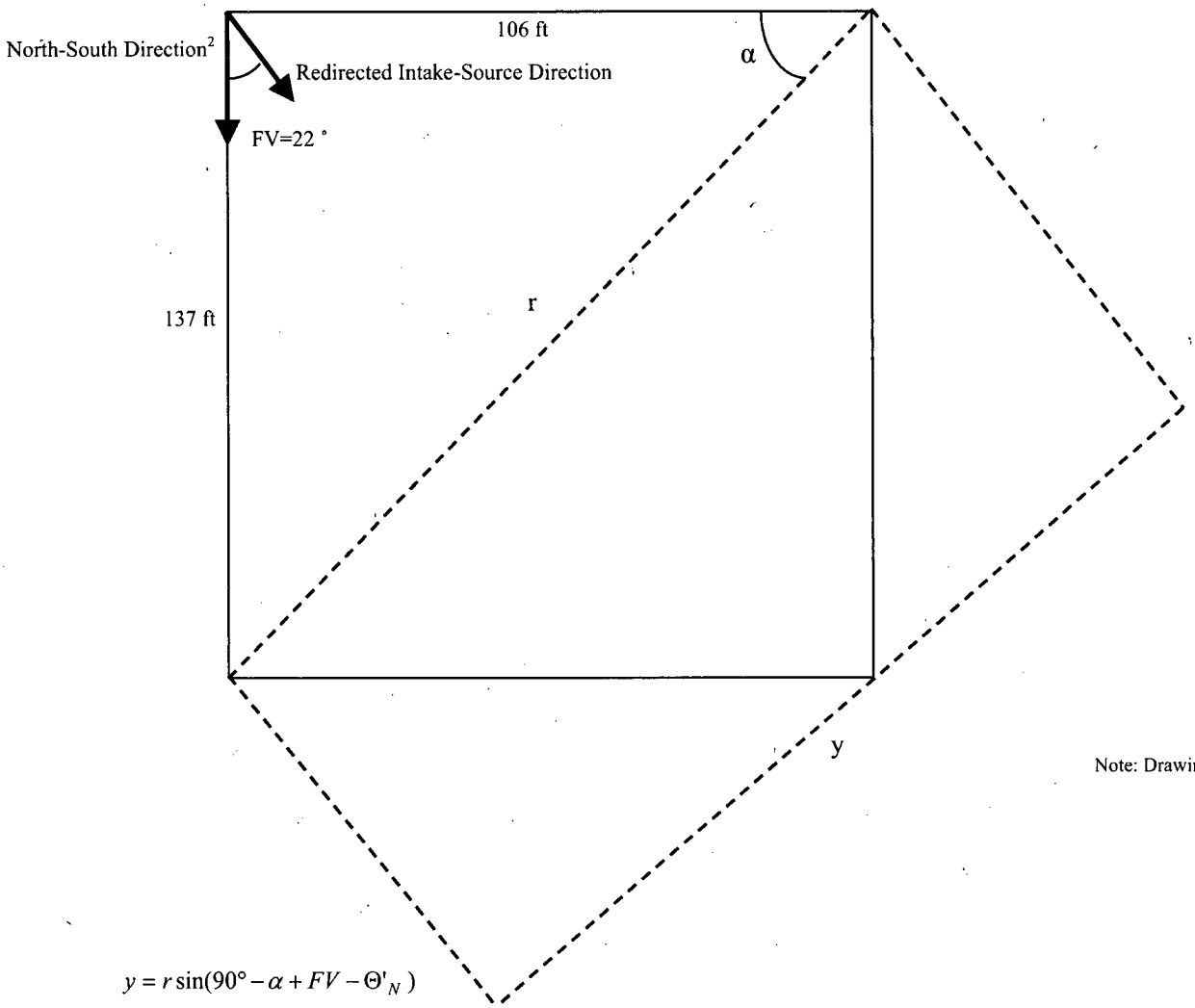
Projected Width = 172.3 ft

Projected Area of Reactor Building = (146)(172.3) = **25155.8 ft^2 = 2337 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration (10b) on Reactor Building South Wall to Control Room HVAC Intake A (Redirected Flow[1])



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 158° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 22°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 22° - 0°)$

$y = 173\sin(60°)$

$y = 149.8\,ft$

Redirected Projected Width = 149.8 ft

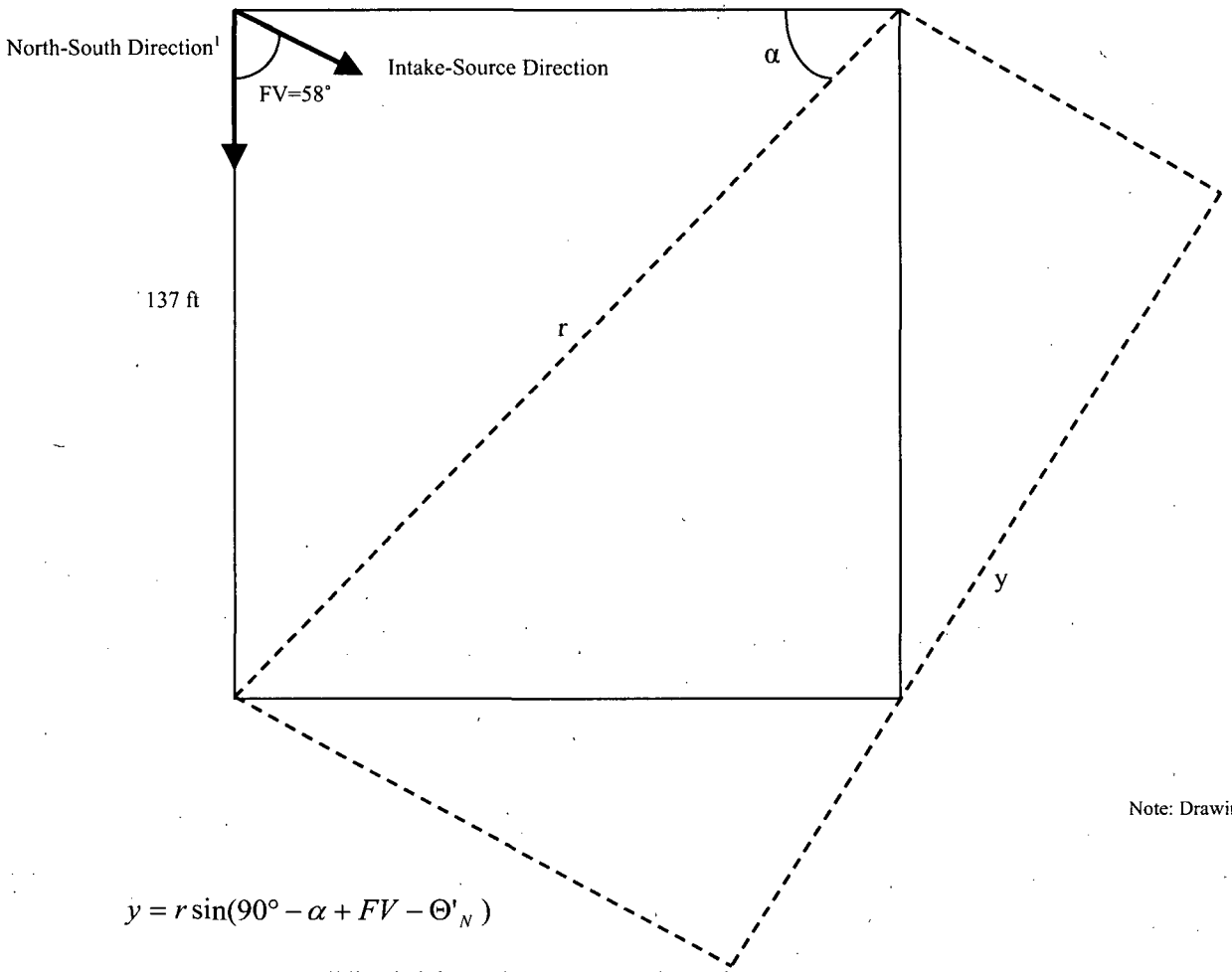
Redirected Projected Area of Reactor Building = (146)(149.8) = 21870.8 ft^2 = **2032 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration (10b) on Reactor Building South Wall to Control Room HVAC Intake B



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 122° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 58°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 58° - 0°)$$
$$y = 173\sin(96°)$$
$$y = 172.1\,ft$$

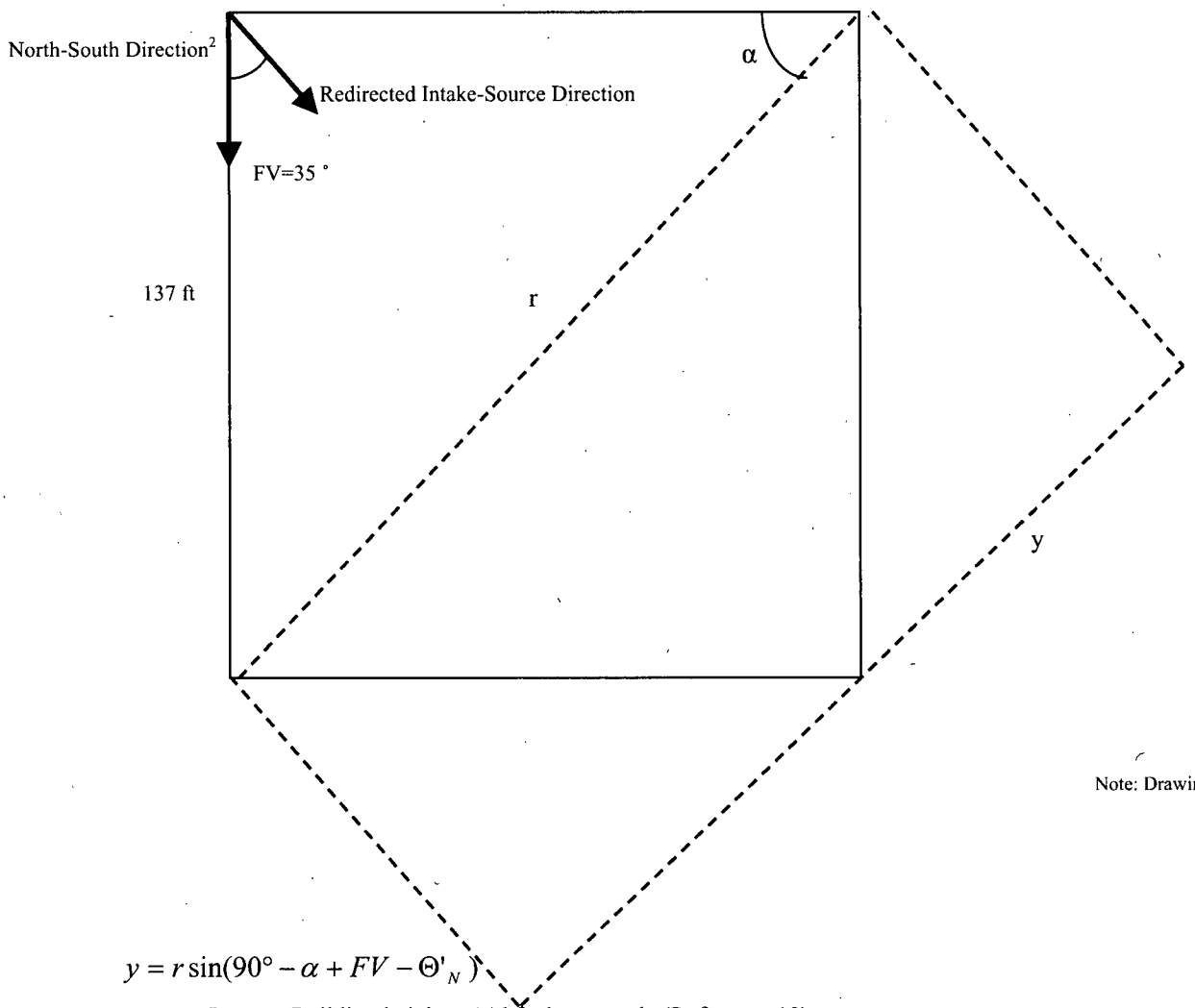
Projected Width = 172.1 ft

Projected Area of Reactor Building = (146)(172.1) = **25126.6 ft^2 = 2334 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration (10b) on Reactor Building South Wall to Control Room HVAC Intake B (Redirected Flow[1])



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 145° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 35°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52 + 35° - 0°)$

$y = 173\sin(73°)$

$y = 165.4\,ft$

Redirected Projected Width = 165.4 ft

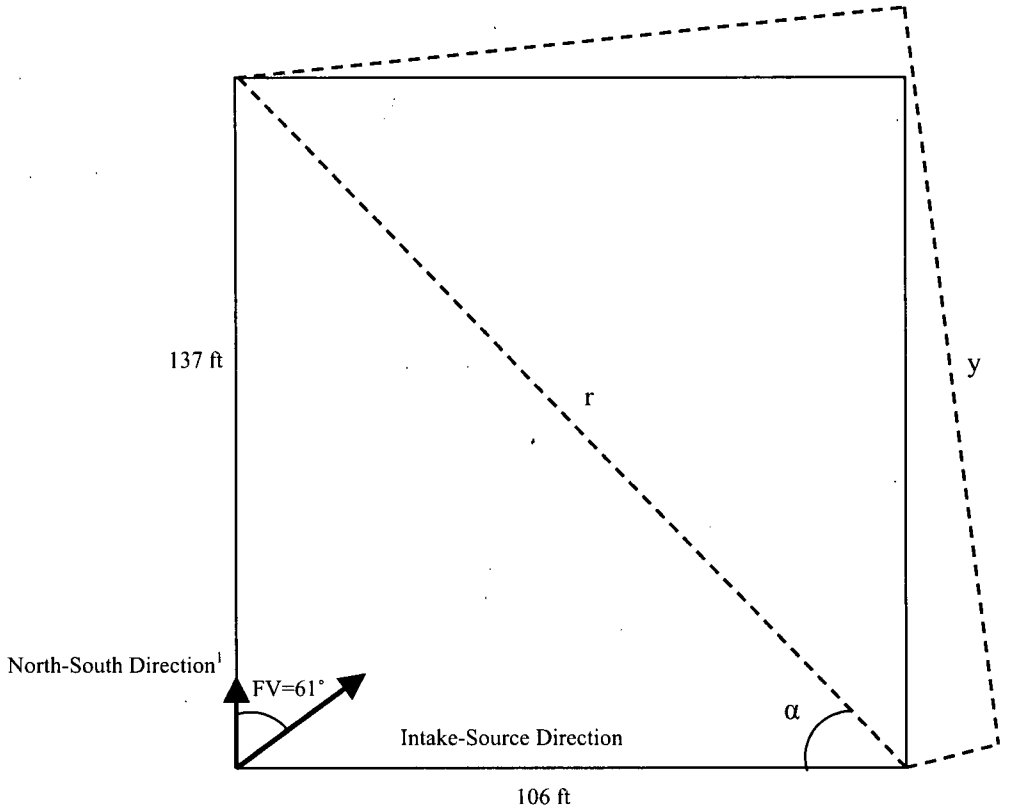
Redirected Projected Area of Reactor Building = (146)(165.4) = 24148.4 ft^2 = **2244 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration on Reactor Building North Wall to Control Room HVAC Intake A



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 61° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 61°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52° + 61° - 0°)$$
$$y = 173\sin(99°)$$
$$y = 170.9\,ft$$

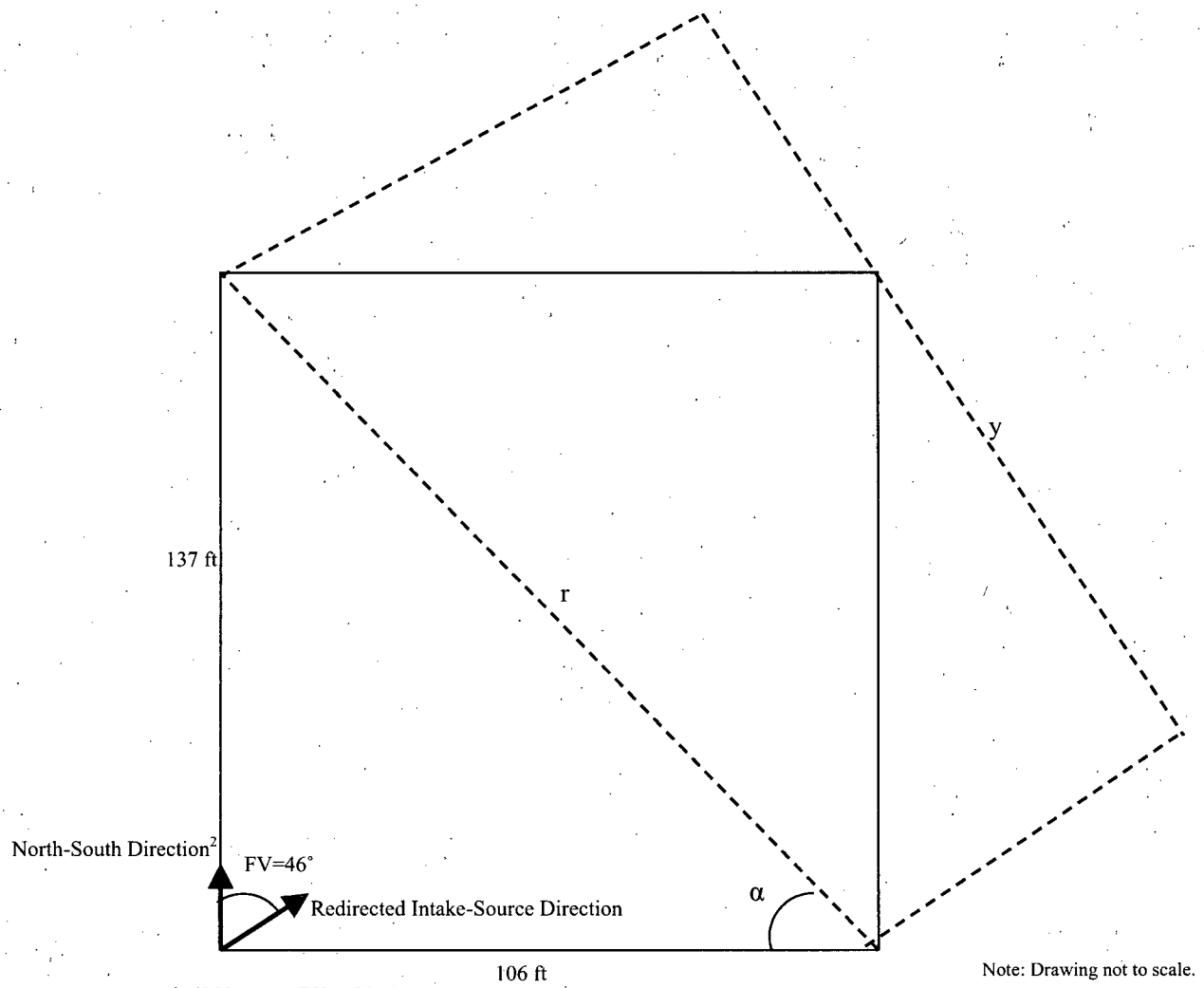
Projected Width = 170.9 ft

Projected Area of Reactor Building = (146)(170.9) = **24951.4 ft^2 = 2318 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration on Reactor Building North Wall to Control Room HVAC Intake A (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 46° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 46°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 46° - 0°)$

$y = 173\sin(84°)$

$y = 172.1\,ft$

Redirected Projected Width = 172.1 ft

Redirected Projected Area of Reactor Building = (146)(172.1) = 25126.6 ft^2 = **2334 m^2**

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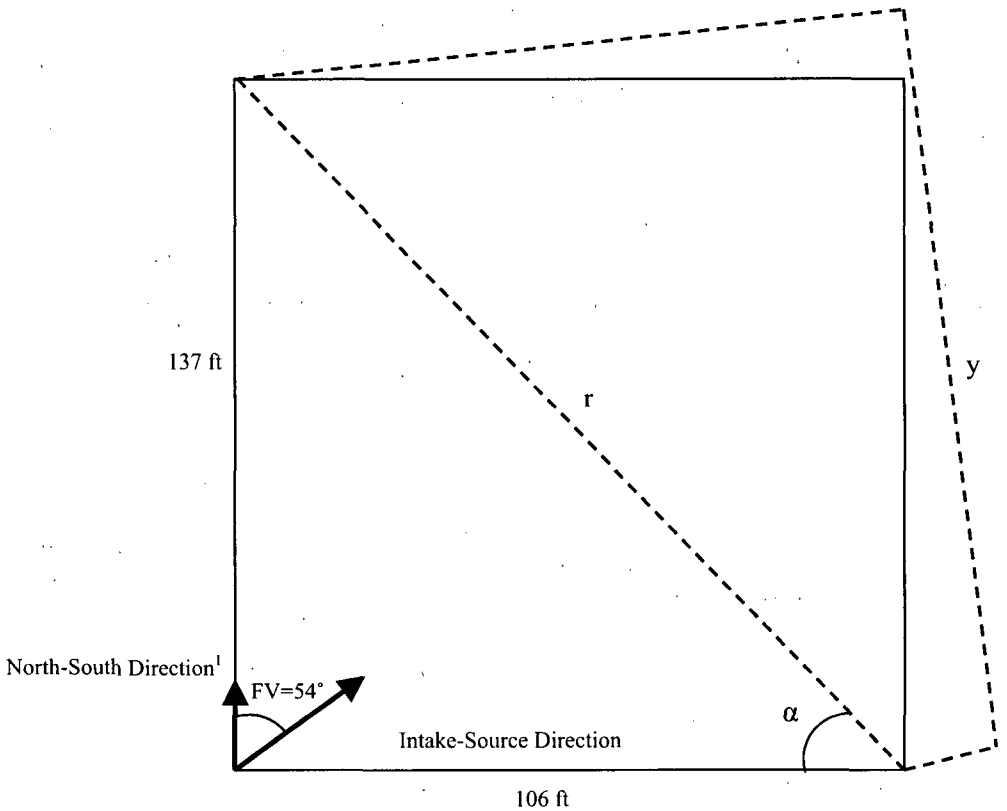
[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: Commodities Penetration on Reactor Building North Wall to Control Room HVAC Intake B



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 54° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 54°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52° + 54° - 0°)$$
$$y = 173\sin(92°)$$
$$y = 172.9\,ft$$

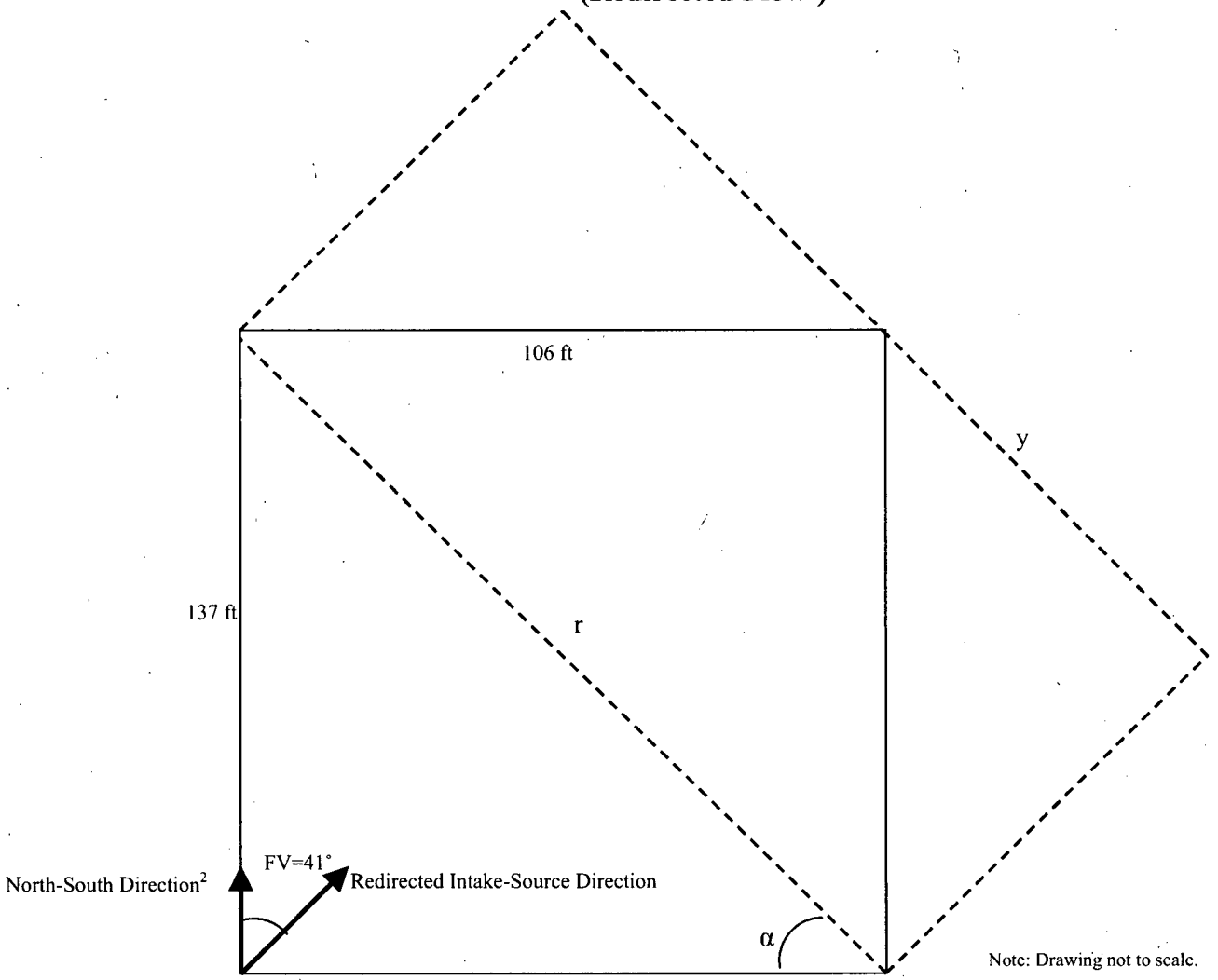
Projected Width = 172.9 ft

Projected Area of Reactor Building = (146)(172.9) = **25243.4 ft^2 = 2345 m^2**

[3] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Alternate Projected Area of the Reactor Building[1]

Scenario: Commodities Penetration on Reactor Building North Wall to Control Room HVAC Intake B (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 41° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 41°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52 + 41° - 0°)$

$y = 173\sin(79°)$

$y = 169.8\,ft$

Redirected Projected Width = 169.8 ft

Redirected Projected Area of Reactor Building = (146)(169.8) = 24790.8 ft^2 = **2303 m^2**

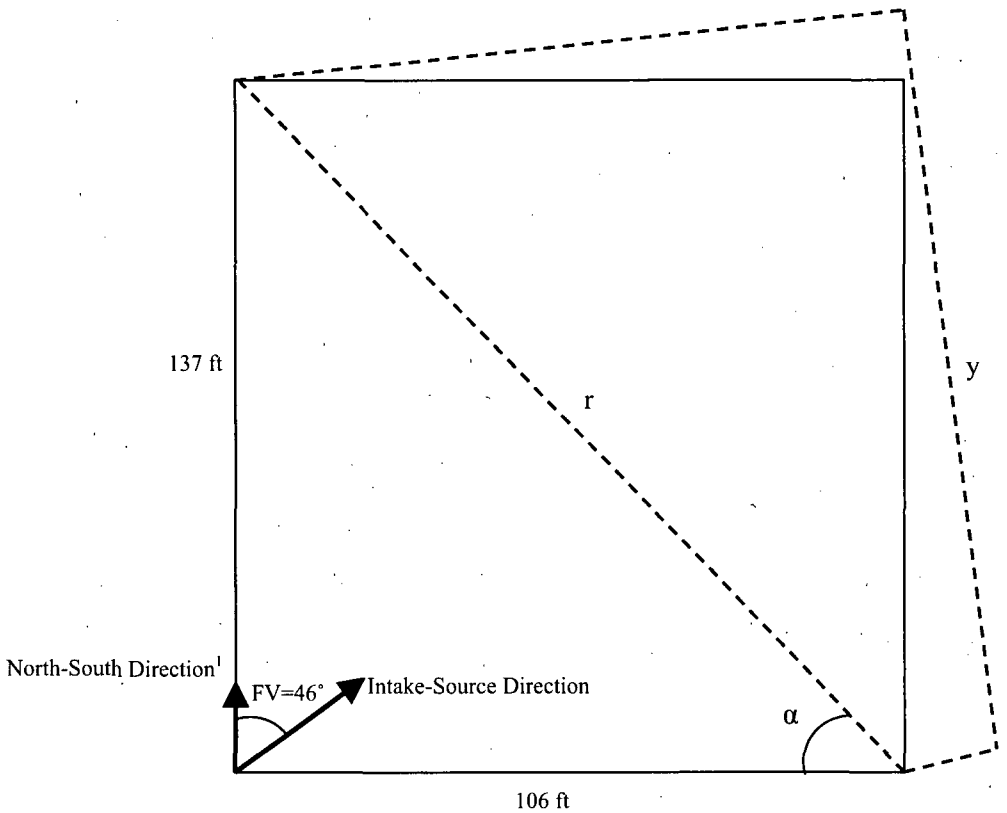
---

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: MAC Facility Personnel Airlock to Control Room HVAC Intake A



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 46° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 46°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52° + 46° - 0°)$$
$$y = 173\sin(84°)$$
$$y = 172.1\,ft$$

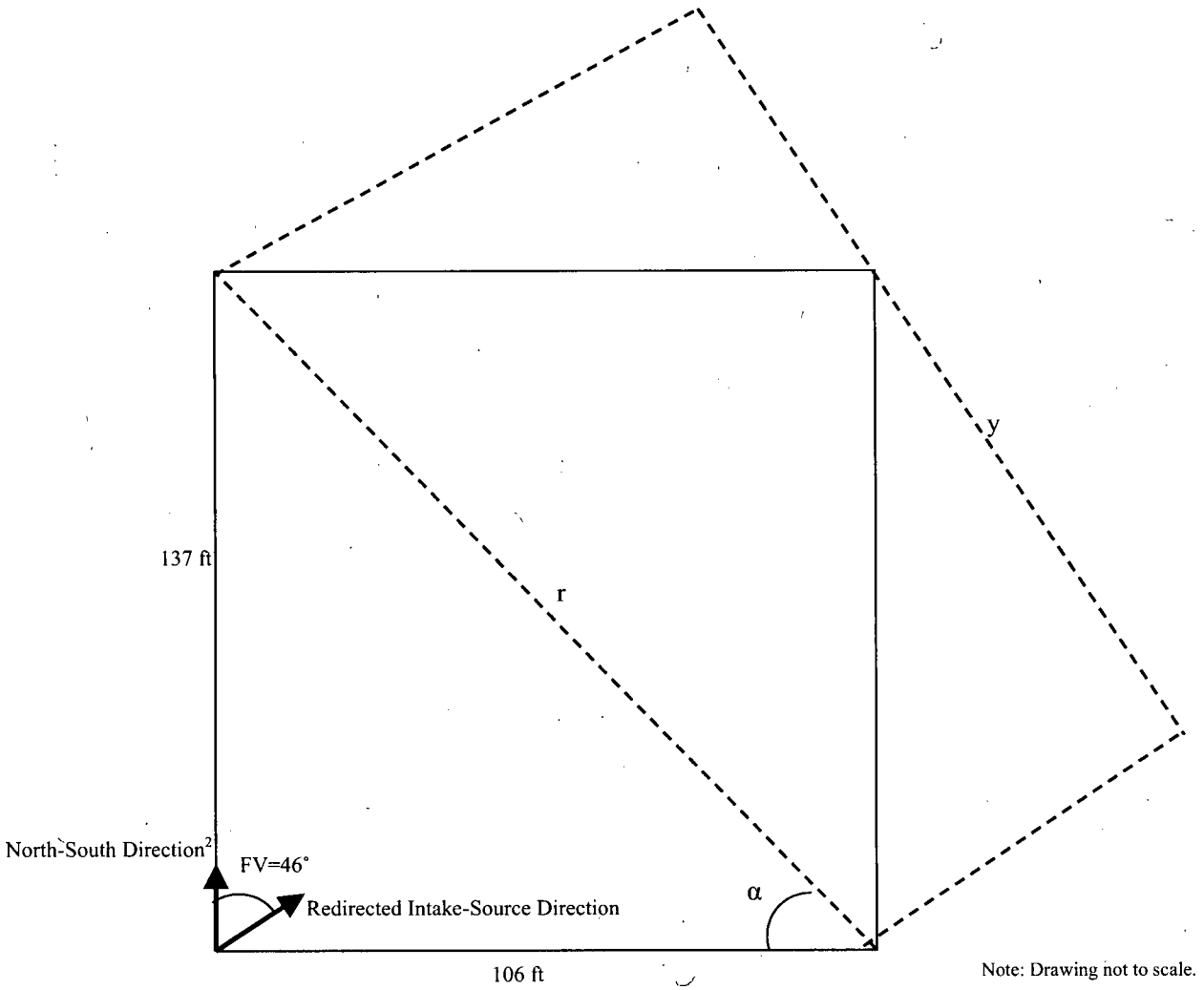
Projected Width = 172.1 ft

Projected Area of Reactor Building = (146)(172.1) = 25126.6 ft^2 = **2334 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: MAC Facility Personnel Airlock to Control Room HVAC Intake A (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 46° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 46°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 46° - 0°)$

$y = 173\sin(84°)$

$y = 172.1\,ft$

Redirected Projected Width = 172.1 ft

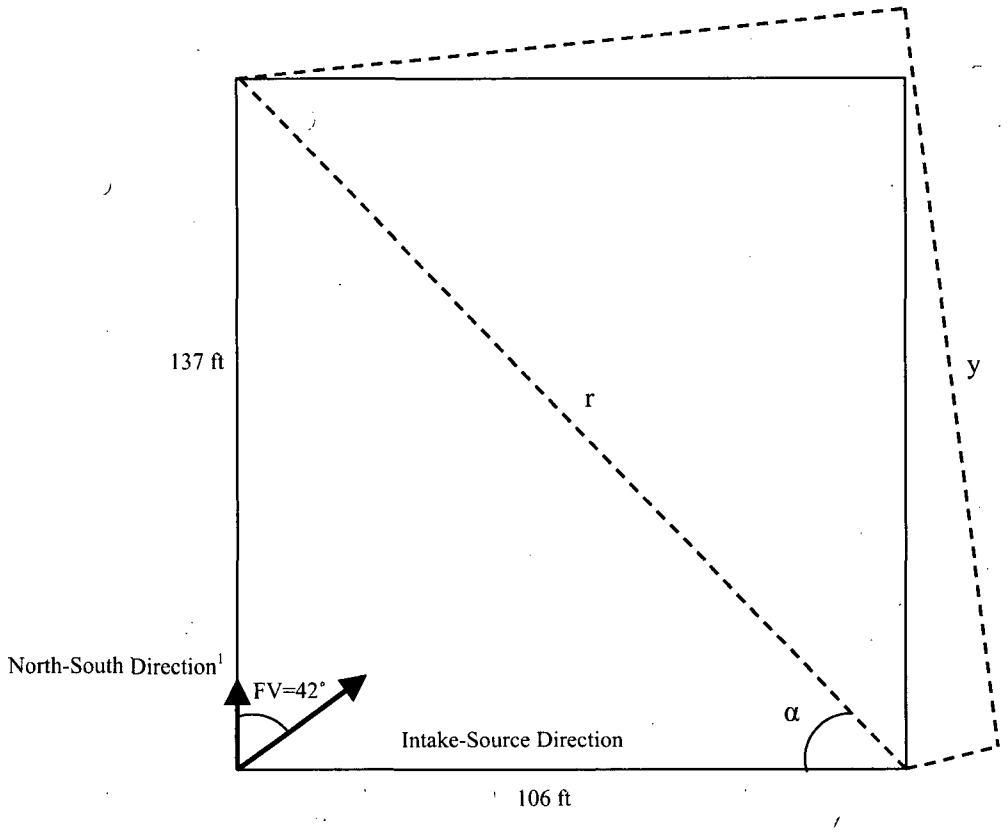
Redirected Projected Area of Reactor Building = (146)(172.1) = 25126.6 ft^2 = **2334 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: MAC Facility Personnel Airlock to Control Room HVAC Intake B



Note: Drawing not to scale.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 42° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 42°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52° + 42° - 0°)$$
$$y = 173\sin(80°)$$
$$y = 170.4\,ft$$

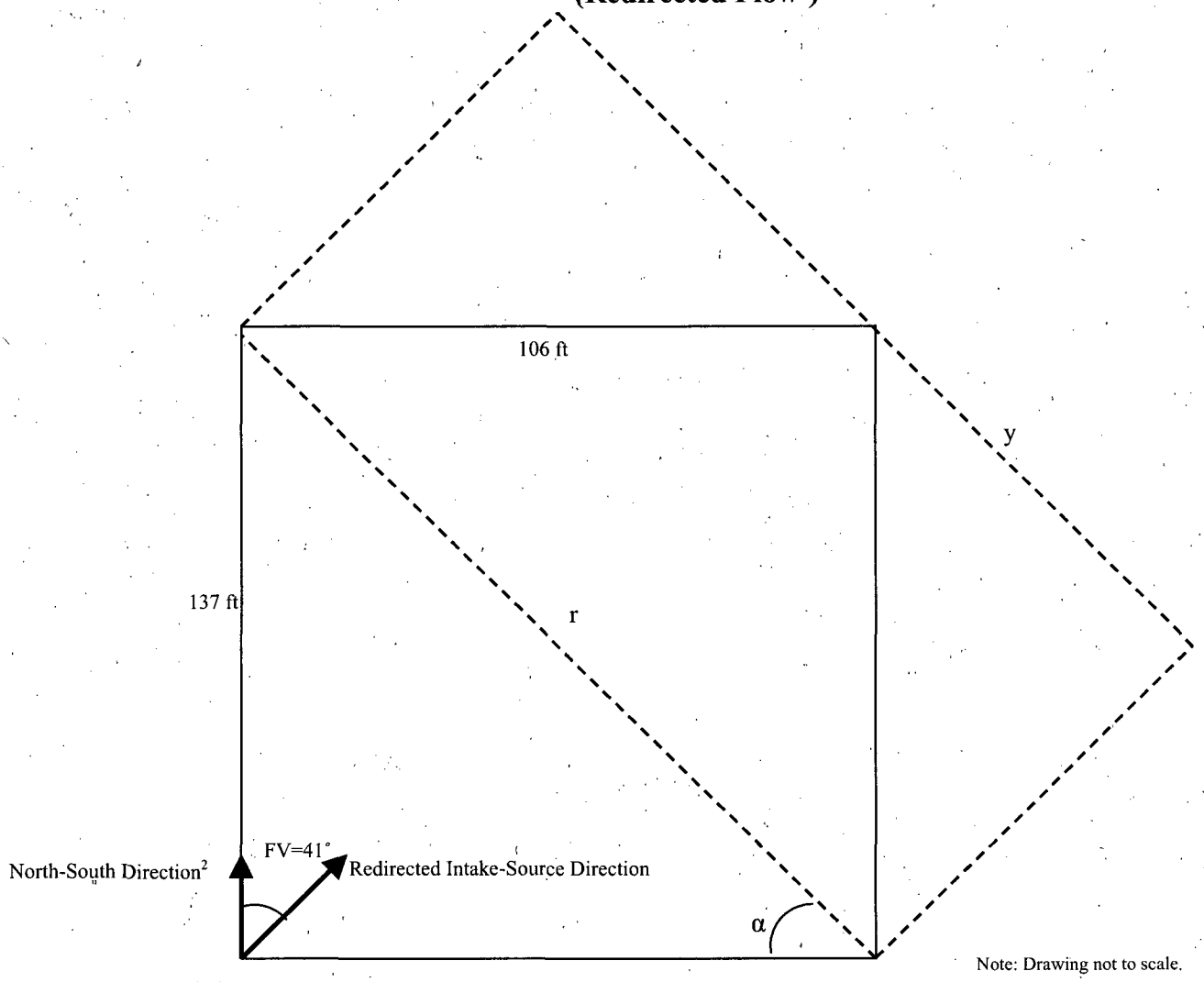
Projected Width = 170.4 ft

Projected Area of Reactor Building = (146)(170.4) = **24878.4 ft^2 = 2311 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Alternate Projected Area of the Reactor Building[1]

Scenario: MAC Facility Personnel Airlock to Control Room HVAC Intake B (Redirected Flow[1])



$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Redirected Intake-Source direction = 41° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 41°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52 + 41° - 0°)$

$y = 173\sin(79°)$

$y = 169.8\,ft$

Redirected Projected Width = 169.8 ft

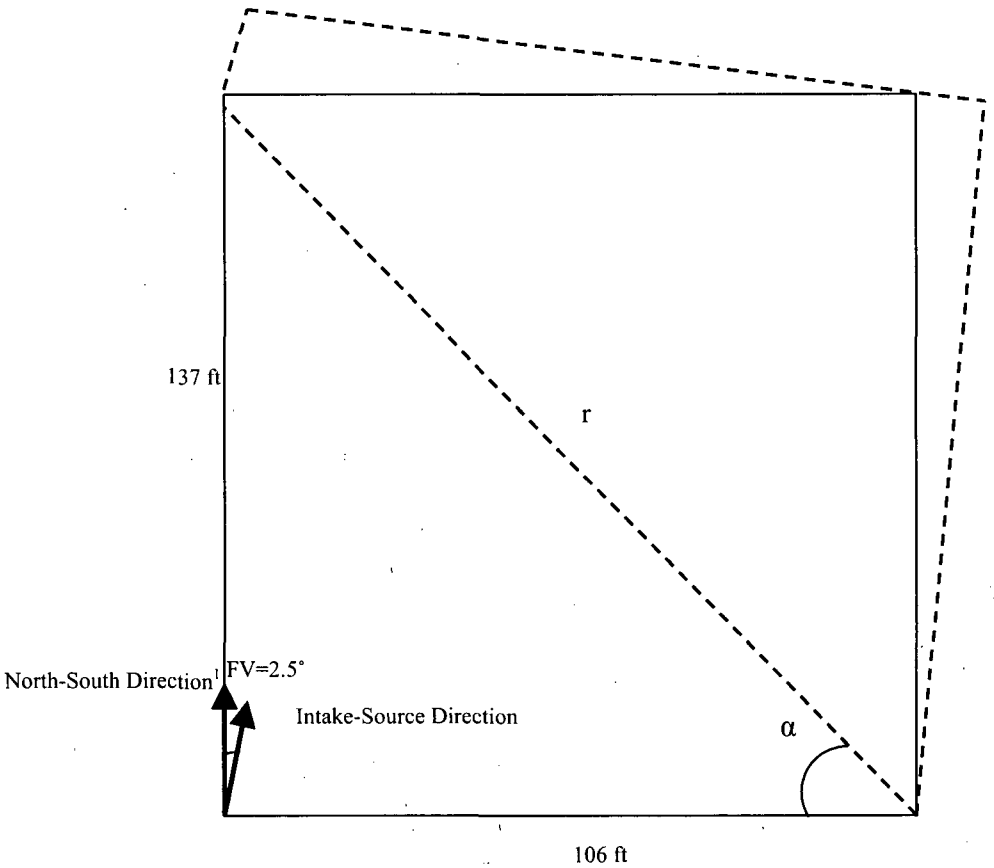
Redirected Projected Area of Reactor Building = (146)(169.8) = 24790.8 ft^2 = **2303 m^2**

[1] Redirected projected area of the Reactor Building utilizes the redirected intake-source direction per Reg. Guide 1.194, Table A-2. This accounts for the redirected flow from the nearest taut string building edge to the intake.

[2] The projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building

Scenario: MAC Facility Entrance to Control Room HVAC Intake A



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 2.5° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 2.5°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 2.5° - 0°)$

$y = 173\sin(40.5°)$

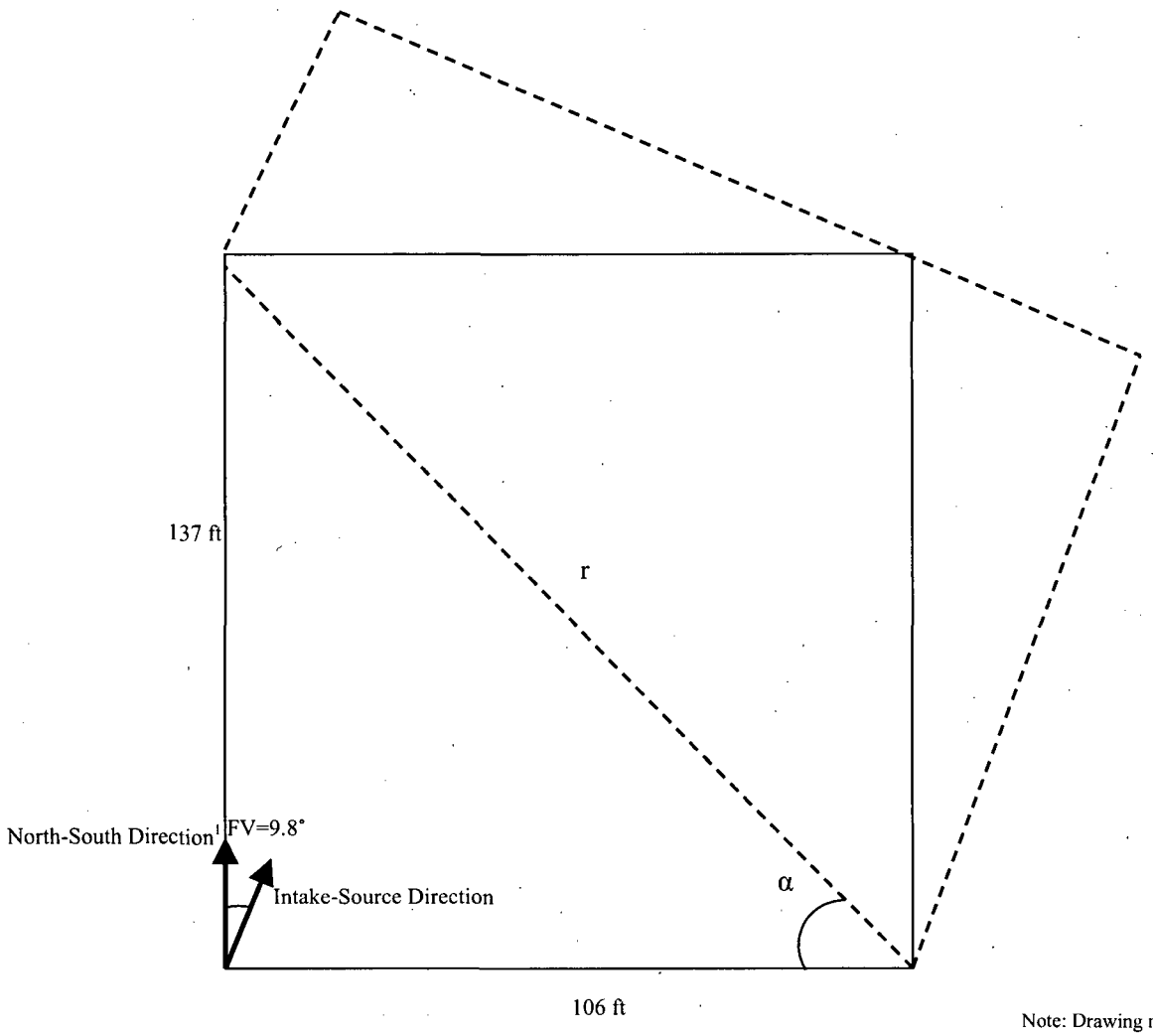
$y = 112.4\,ft$

Projected Width = 112.4ft

Projected Area of Reactor Building = (146)(112.4) = 16410.4 ft^2 = **1525 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Projected Area of the Reactor Building
Scenario: MAC Facility Entrance to Control Room HVAC Intake B



Note: Drawing not to scale.

$y = r\sin(90° - \alpha + FV - \Theta'_N)$

- Reactor Building height = 146 ft above grade (Reference 10)
- Reactor Building width = 106 ft (Reference 14)
- Reactor Building length = 137 ft (Reference 11)
- Intake-Source direction = 31° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \quad \therefore \alpha = 52°$
- $FV = 9.8°$
- $\Theta'_N = 0°$

$y = 173\sin(90° - 52° + 9.8° - 0°)$

$y = 173\sin(47.8°)$

$y = 128.2\,ft$

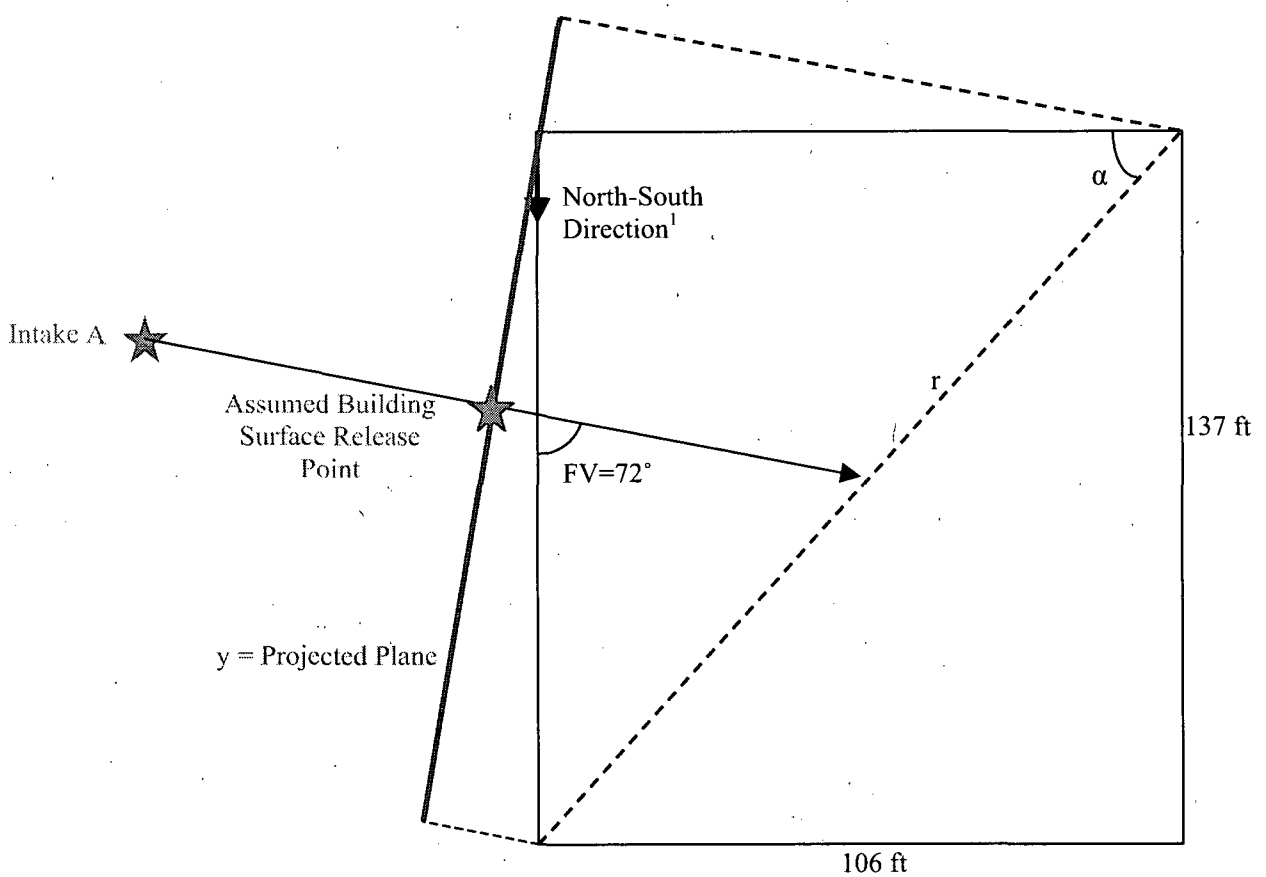
Projected Width = 128.2 ft

Projected Area of Reactor Building = (146)(128.2) = 18717.2 ft^2 = **1739 m^2**

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

Release Height, Initial Diffusion Coefficients and Projected Width and Area of Reactor Building

Scenario: Reactor Building Wall to Intake A (Diffuse Area)



Note: Drawing not to scale

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height –Office Building height = 146 ft above grade – 38 ft above grade = 108 ft (Sketches from John Yuen)
- Reactor Building width = 106 ft (Drawing 3E-153-02-007)
- Reactor Building length = 137 ft (Drawing 3E-153-02-002)
- Intake-Source direction = 108.1° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{106^2 + 137^2} = 173\,ft$
- $\sin\alpha = \left(\frac{length}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 72°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 72° - 0°)$$
$$y = 173\sin(110°)$$
$$y = 162.6\text{ft}$$

Projected Width = 162.6 ft = **49.6 m**

Building Area = Projected Area of Reactor Building above the Office Building Height= (108)(162.6) = 17560.8 ft^2 = **1631.5 m^2**

Release Height = Vertical Center of the Projected Area of the Reactor Building above the Office Building Height = (108/2) + 38 = **92 ft = 28 m**

Alternate Building Area = Projected Area of the Reactor Building = (146)(162.6) = 23739.6 **ft^2 = 2205 m^2**

Alternate Release Height = Vertical Center of the Projected Area of the Reactor Building = 146/2 = **73 ft = 22.3 m**

Diffusion coefficients (per Reg. Guide 1.194, Section 3.2.4.4):

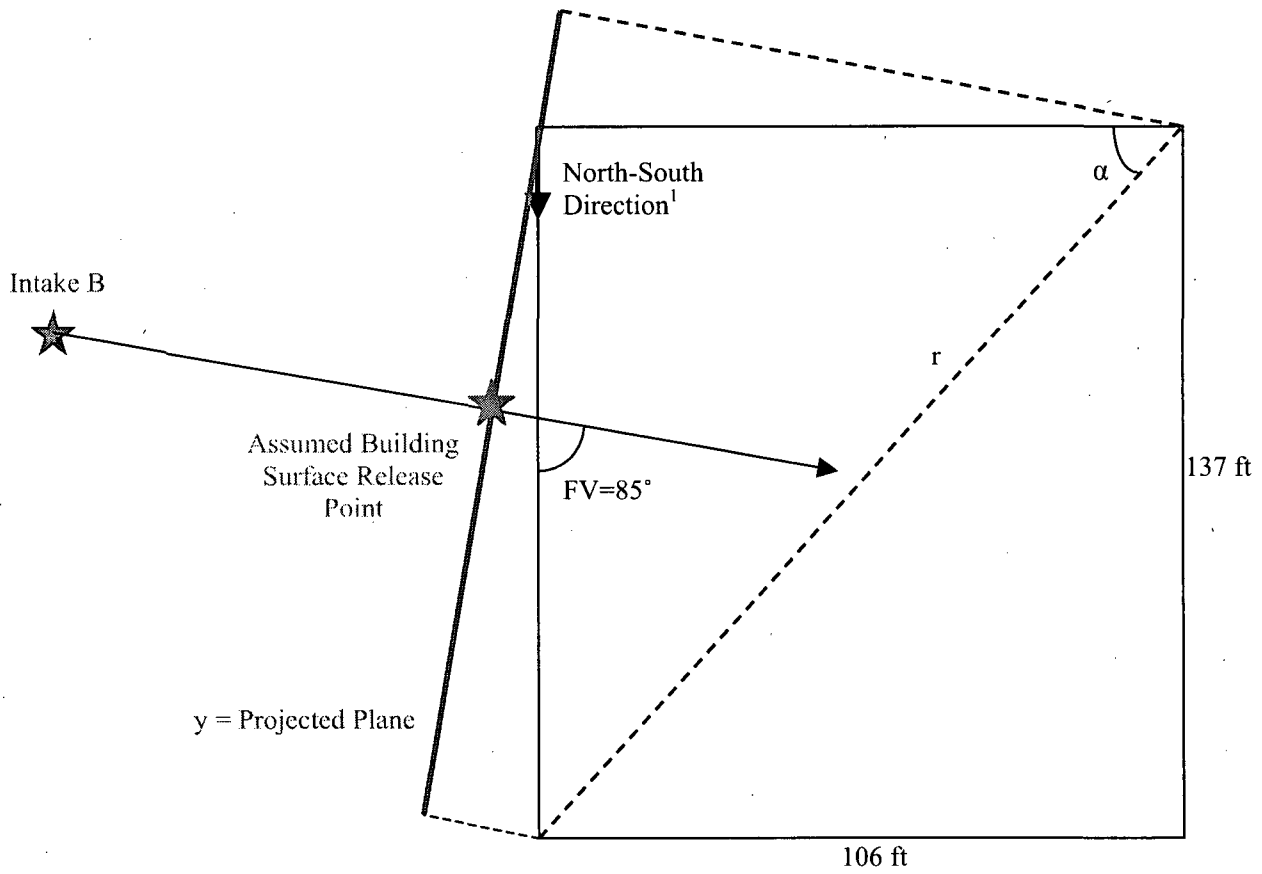
$$\sigma_y = \left(\frac{\text{projected width}}{6}\right) = \left(\frac{49.6\,m}{6}\right) = 8.3\,m$$

$$\sigma_z = \left(\frac{\text{height of the Reactor Building above the Office Building}}{6}\right) = \left(\frac{32.9\,m}{6}\right) = 5.5\,m$$

$$\text{Alternate}\,\sigma_z = \left(\frac{\text{height of the Reactor Building}}{6}\right) = \left(\frac{44.5\,m}{6}\right) = 7.4\,m$$

Release Height, Initial Diffusion Coefficients and Projected Width and Area of Reactor Building

Scenario: Reactor Building Wall to Intake B (Diffuse Area)



Note: Drawing not to scale

[1] Projected area being calculated is mathematically identical regardless of whether wind direction deviation is from the north or south.

$$y = r\sin(90° - \alpha + FV - \Theta'_N)$$

- Reactor Building height –Office Building height = 146 ft above grade – 38 ft above grade = 108 ft (Sketches from John Yuen)
- Reactor Building width = 106 ft (Drawing 3E-153-02-007)
- Reactor Building length = 137 ft (Drawing 3E-153-02-002)
- Intake-Source direction = 95° from plant north
- $r = \sqrt{width^2 + length^2} = \sqrt{137^2 + 106^2} = 173\,ft$
- $\sin\alpha = \left(\frac{width}{r}\right) = \left(\frac{137}{173}\right) = .7919 \qquad \therefore \alpha = 52°$
- $FV = 85°$
- $\Theta'_N = 0°$

$$y = 173\sin(90° - 52 + 85° - 0°)$$
$$y = 173\sin(123)$$
$$y = 145.1\,ft$$

Projected Width = 145.1 ft = **44.2 m**

Building Area = Projected Area of Reactor Building above the Office Building Height= (108)(145.1) = 15670.8 ft^2 = **1455.9 m^2**

Release Height = Vertical Center of the Projected Area of the Reactor Building above the Office Building Height = (108/2) + 38 = **92 ft = 28 m**

Alternate Building Area = Projected Area of the Reactor Building = (146)(145.1) = **21184.6 ft^2 = 1968 m^2**

Alternate Release Height = Vertical Center of the Projected Area of the Reactor Building = 146/2 = **73 ft = 22.3 m**

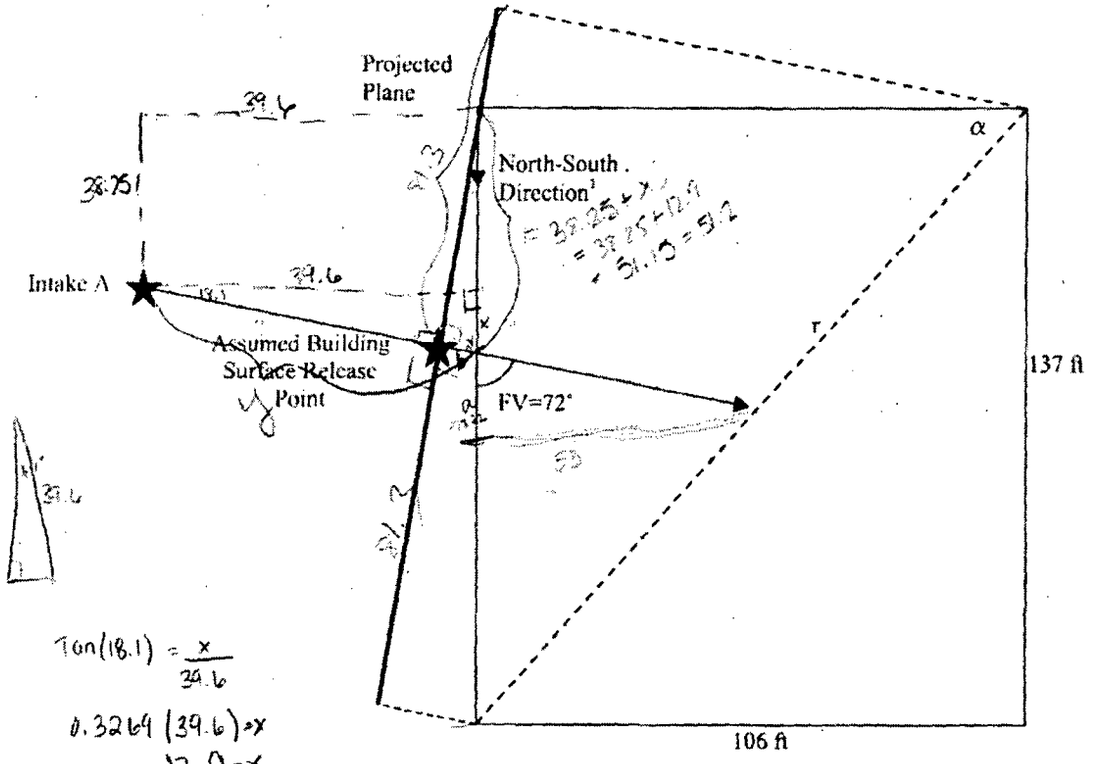
Diffusion coefficients (per Reg. Guide 1.194, Section 3.2.4.4):

$$\sigma_y = \left(\frac{\text{projected width}}{6}\right) = \left(\frac{44.2\,m}{6}\right) = 7.4\,m$$

$$\sigma_z = \left(\frac{\text{height of the Reactor Building above the Office Building}}{6}\right) = \left(\frac{32.9\,m}{6}\right) = 5.5\,m$$

$$\text{Alternate}\,\sigma_z = \left(\frac{\text{height of the Reactor Building}}{6}\right) = \left(\frac{44.5\,m}{6}\right) = 7.4\,m$$

Distance from Intake A to Assumed Building Surface Release Point (Diffuse Area)



$\tan(18.1) = \frac{x}{39.6}$

$0.3269(39.6) = x$

$12.9 = x$

$\cos(18.1) = \frac{39.6}{y}$

$0.9505(y) = 39.6$

$y = 41.7$

$\tan 71.9 = \frac{53}{a}$

$3.0777 = \frac{53}{a}$

$a = 17.3$

$\cos 71.9 = \frac{b}{51.2}$

$0.3090(51.2) = b$

$15.9 = b$

Note: Drawing not to scale

Distance Intake to Source =

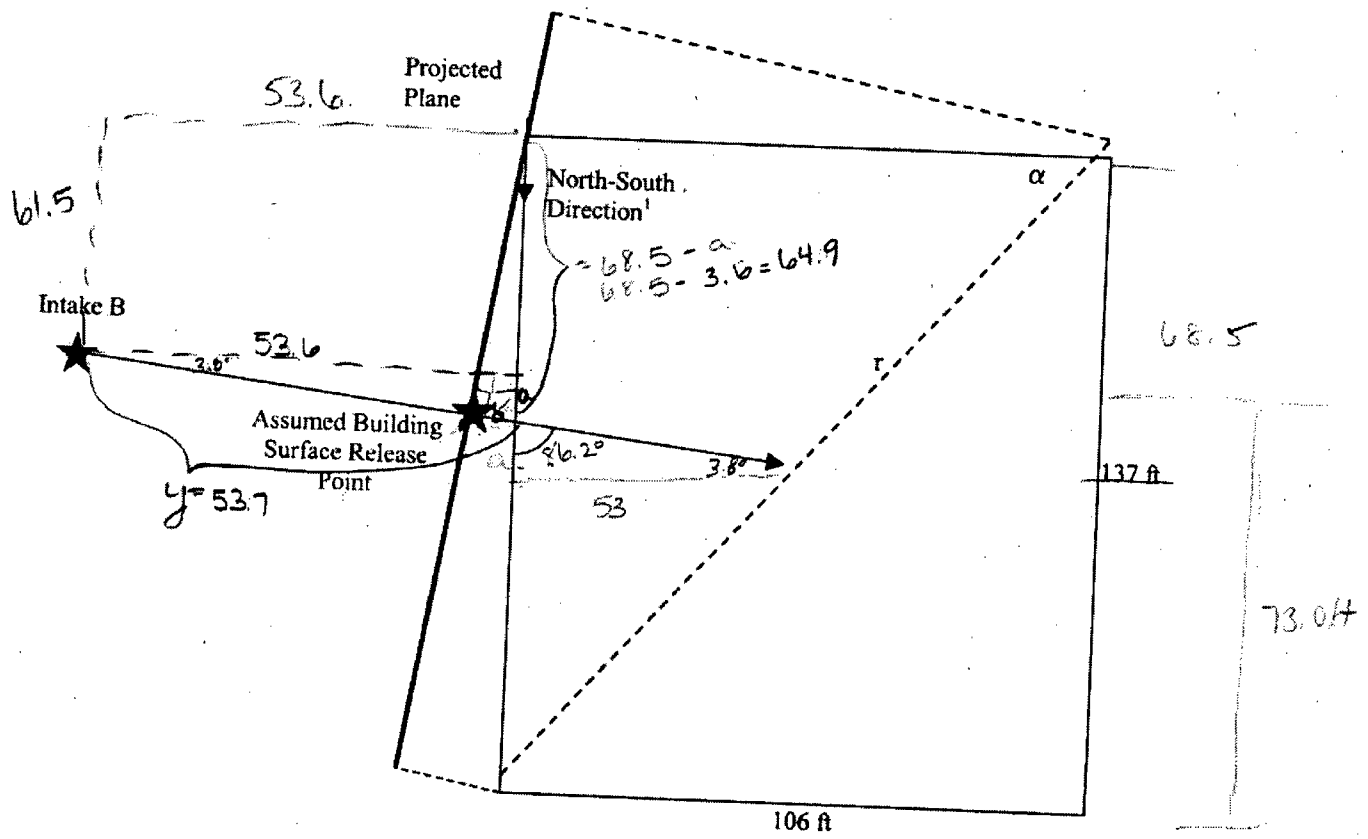
$= y - b$

$= 41.7 - 15.9$

$= 25.8$ ft

$= 7.9$ m

Distance from Intake B to Assumed Building Surface Release Point (Diffuse Area)



Note: Drawing not to scale

$\cos 3.8 = \frac{53.6}{y}$

$0.9978\, y = 53.6$

$y = 53.7$

$\tan 3.8 = \frac{a}{53.6}$

$0.0664 = \frac{a}{53.6}$

$3.6 = a$

$\cos 86.2 = \frac{b}{64.9}$

$0.0623 = \frac{b}{64.9}$

$4.3 = b$

Distance Intake to Source =

$= y - b$

$= 53.7 - 4.3$

$= 49.4$

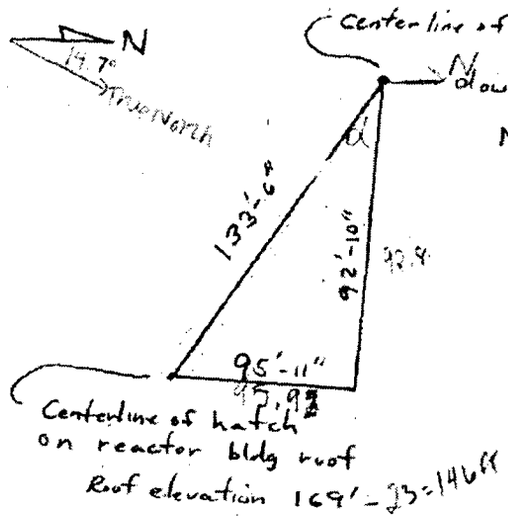
$= 15.1\,m$

Directions - Intake to Source

I / 1

True North is 14.7° east of plant North (Calc C-1302-826-E540-017 Rev 0)

"A" Control Rm HVAC



$\tan \alpha = \frac{95.9}{92.8}$

$\tan \alpha = 1.03$

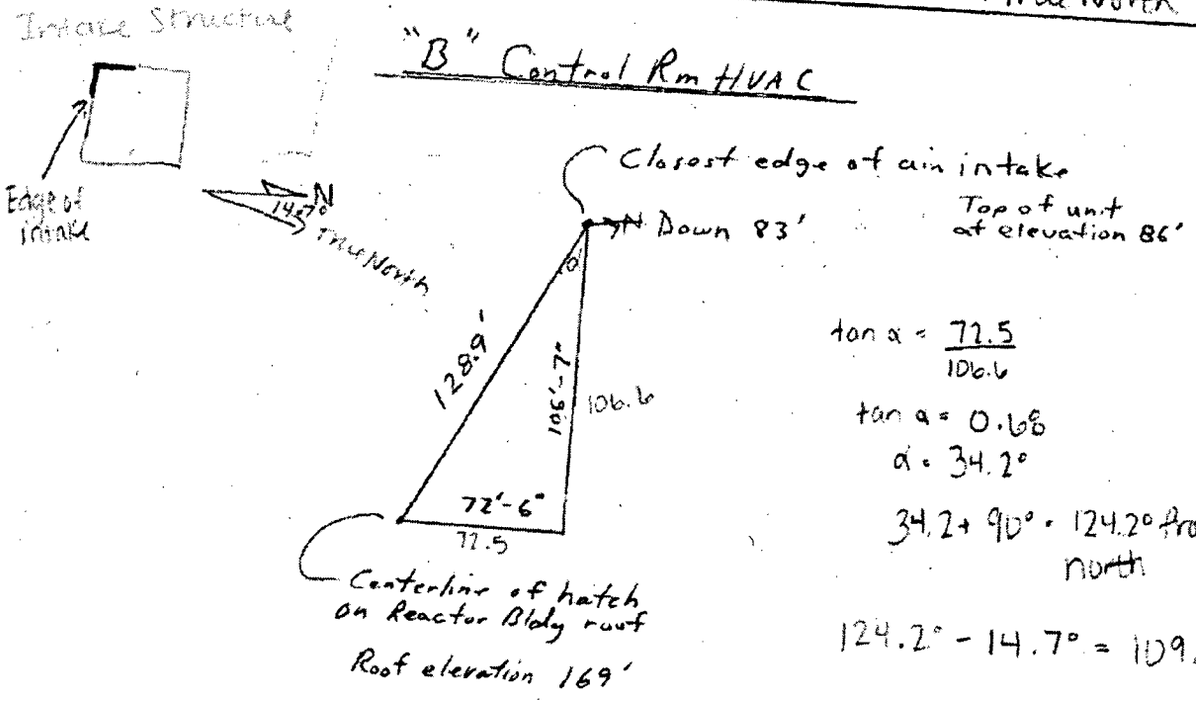
$\alpha = 45.8°$

$90° + 45.8° = 135.8°$ from plant North

$135.8° - 14.7° = 121.1°$

∴ 121° from True North

"B" Control Rm HVAC



$\tan \alpha = \frac{72.5}{106.6}$

$\tan \alpha = 0.68$

$\alpha = 34.2°$

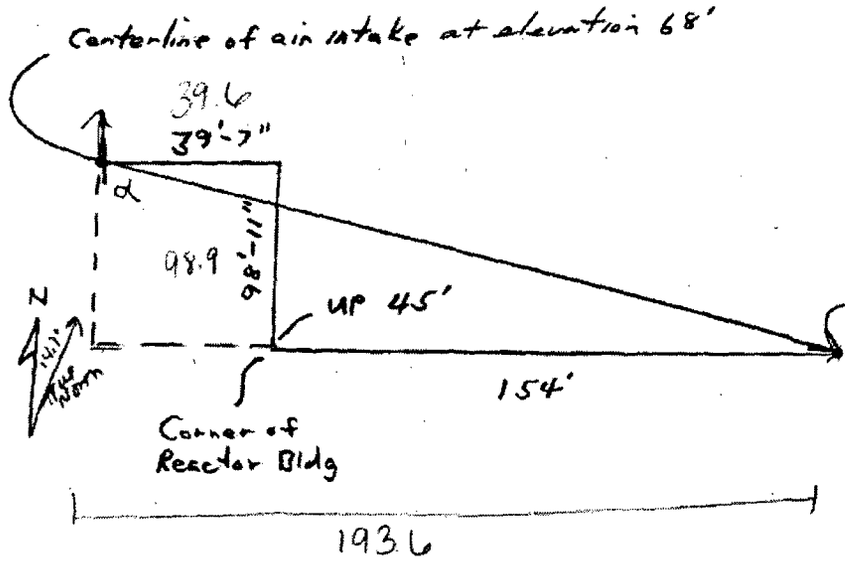
$34.2 + 90° = 124.2°$ from plant north

$124.2° - 14.7° = 109.5$

∴ 110° from True North

Item 5

"A" Control Room HVAC



$\tan \alpha = \frac{193.6}{98.9}$

$\tan \alpha = 1.9575$

$\alpha = 62.9°$

$180° - 62.9° = 117.1°$ from Plant North

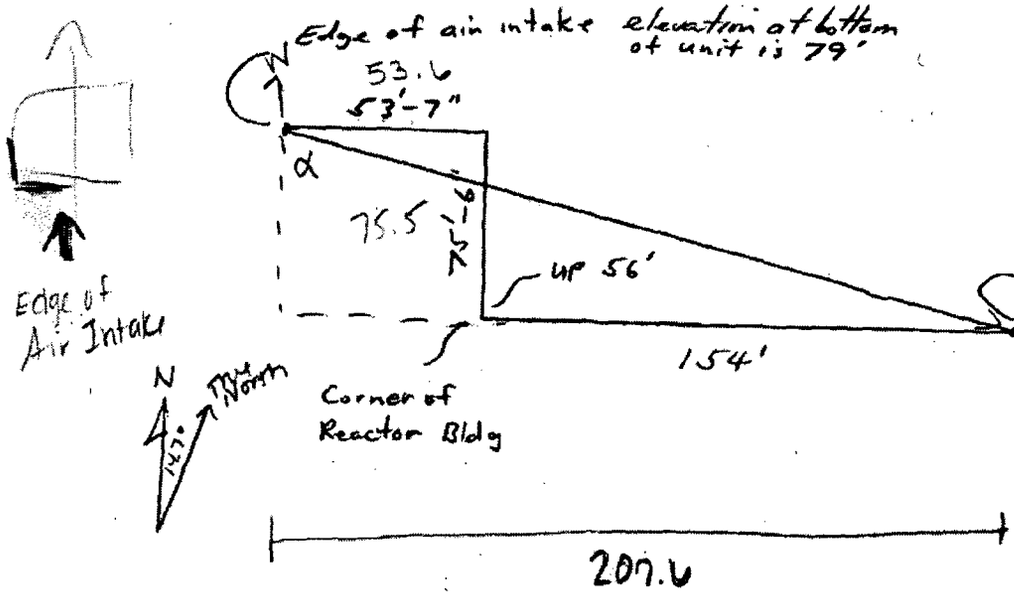
$117.1° - 14.7° = 102.4°$ from True North

Centerline of Door from Stack Tunnel

Ground Elevation 23'

∴ 102° from True North

"B" Control Room HVAC



$\tan \alpha = \frac{207.6}{75.5}$

$\tan \alpha = 2.7490$

$\alpha = 70.0°$

$180° - 70 = 110°$

110° from plant North

$110° - 14.7° = 95.3°$ from True North

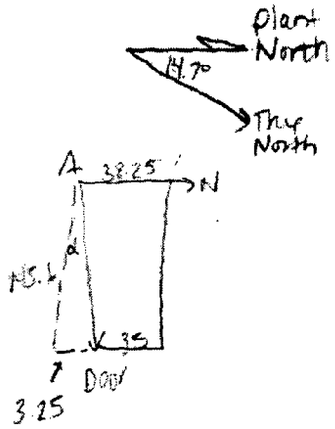
Centerline of Door from Stack Tunnel

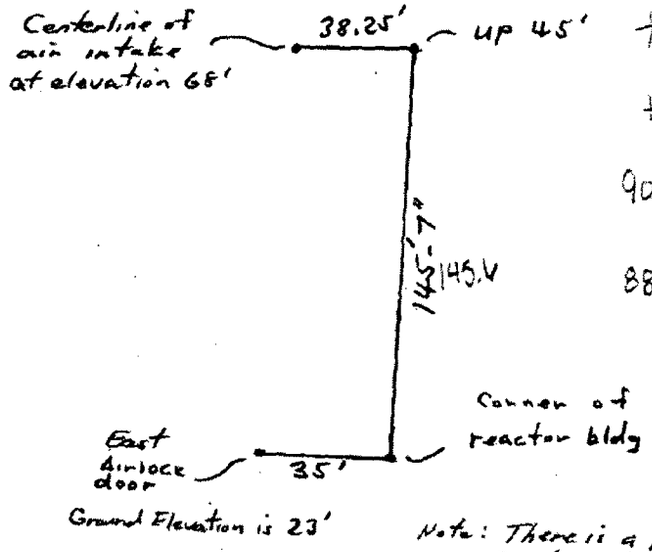
Ground Elevation 23'.

∴ 95° from True North

Item 6A

"A" Control Room HVAC





$\tan\alpha = \frac{3.25}{145.6}$

$\tan\alpha = 0.0223$

$\alpha = 1.3°$

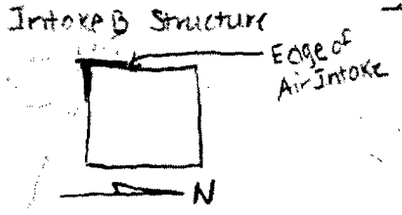
$90° - 1.3° = 88.7°$ from plant North

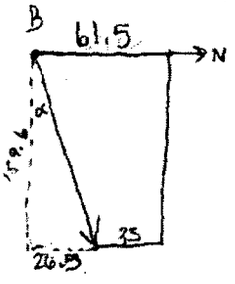
$88.7° - 14.7° = 74°$

∴ 74° from True North

Note: There is a prefab structure enclosed around the door.

"B" Control Room HVAC

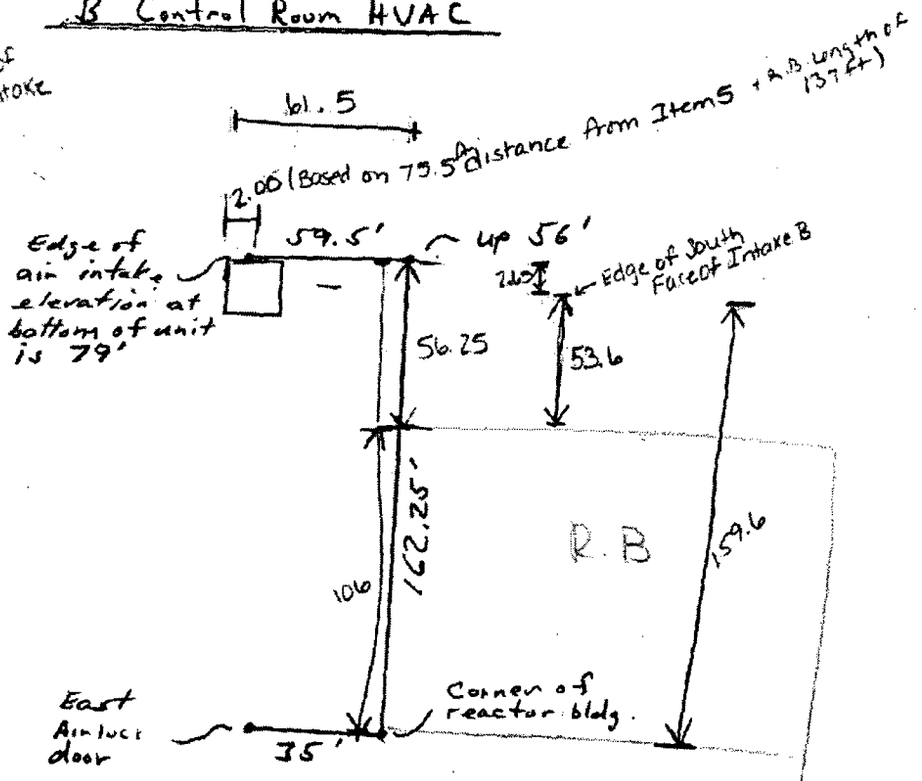




$\tan\alpha = \frac{26.5}{159.6}$

$\tan\alpha = 0.1660$

$\alpha = 9.4$



$90° - 9.4° = 80.6°$ from plant North

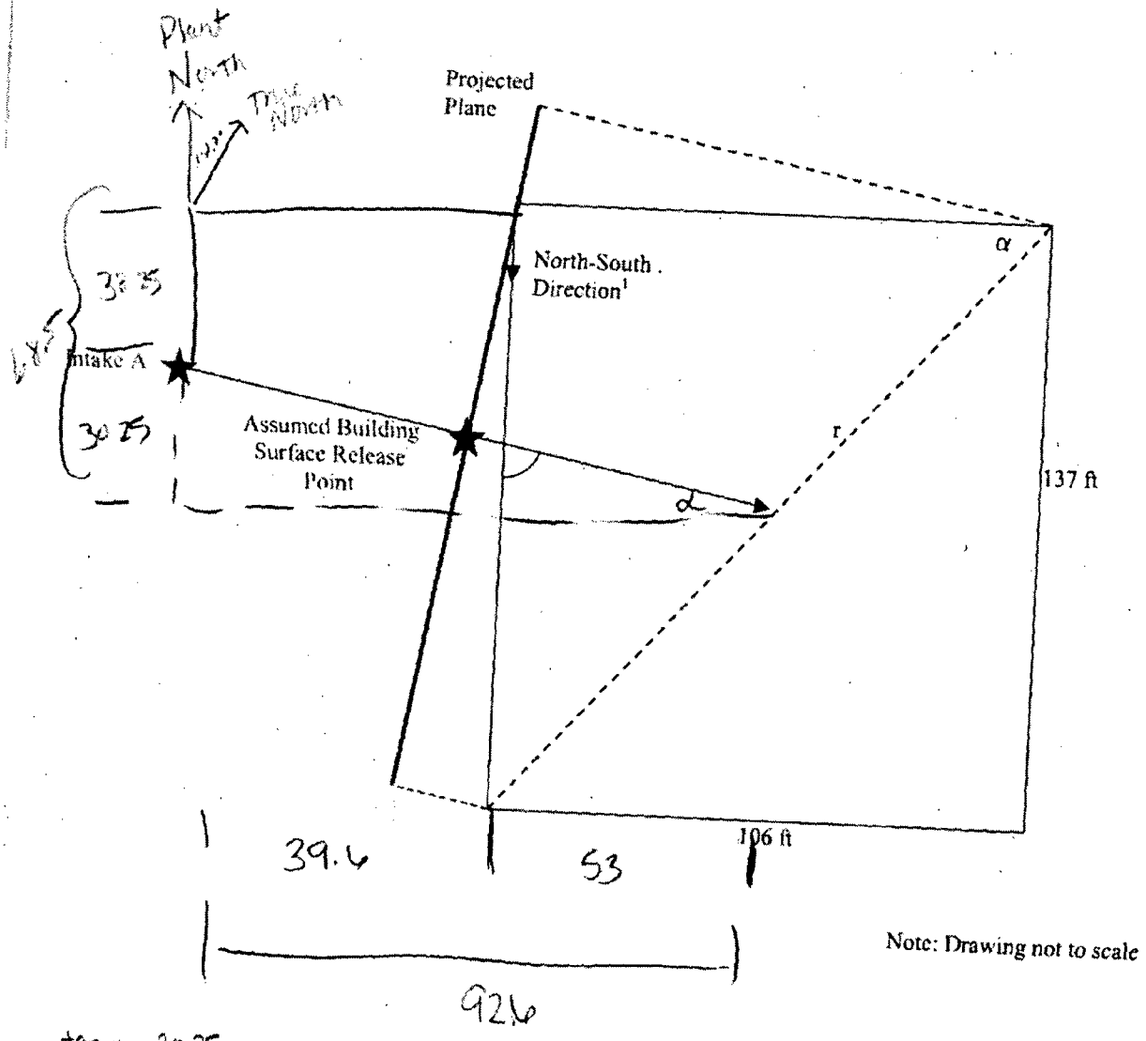
$80.6° - 14.7° = 65.9°$ from True North

∴ 66° from True North

Note: There is a prefab structure enclosed around the door.

Oyster Creek

Direction from Intake A to Reactor Building Wall (Diffuse Area)



Note: Drawing not to scale

$\tan\alpha = \frac{30.25}{92.6} = 0.3267$

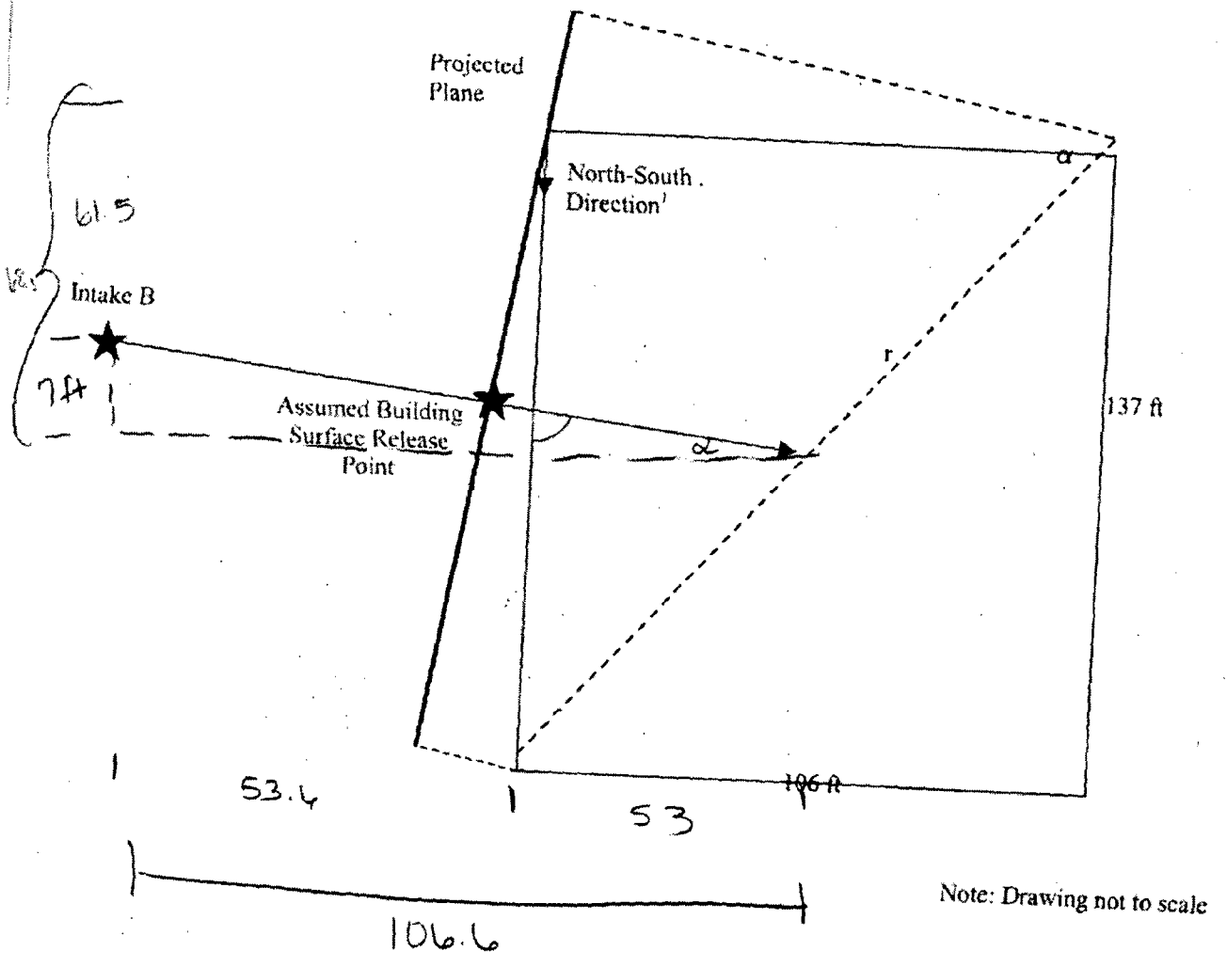
$\alpha = 18.1°$

$90° + 18.1 = 108.1°$ from Plant North

$108.1 - 14.7° = 93.4°$ ∴ 93° from True North

Direction from Intake B to Reactor Building Wall (Diffuse Area

Oyster Creek



Note: Drawing not to scale

$\tan\alpha = \frac{7}{106.6} = 0.0657$

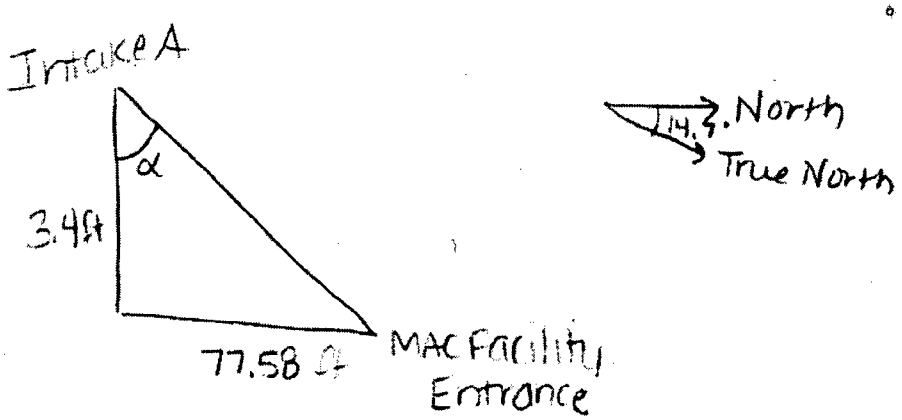
$\alpha = 3.8°$

$90° + 3.8° = 93.8°$ from plant North

$93.8° - 14.7° = 79.1°$

$\therefore 79°$ from True North

Direction from Intake A to the MAC Facility Entrance



$$\tan \alpha = \frac{77.58}{3.4} = 22.8176$$

$$\alpha = 87.5°$$

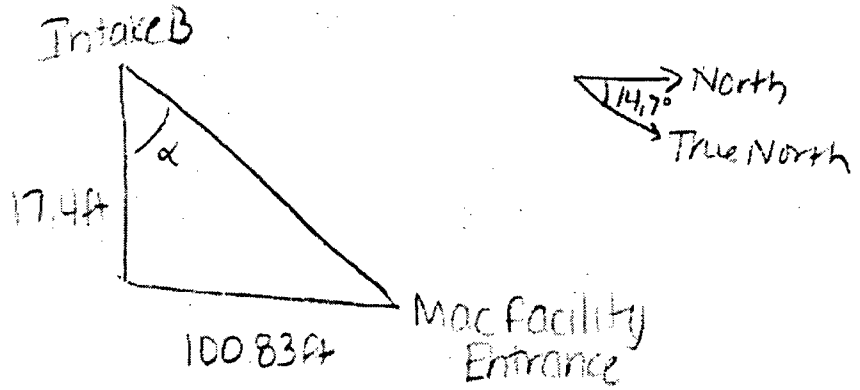
$90 - 87.5° = 2.5°$ from plant north

$2.5° - 14.7° = -12.2°$

$360° - 12.2° = 347.8°$

$\therefore$ 348° from True North

Direction from Intake B to the MAC Facility Entrance



$$\tan \alpha = \frac{100.83}{17.4} = 5.7948$$

$$\alpha = 80.2°$$

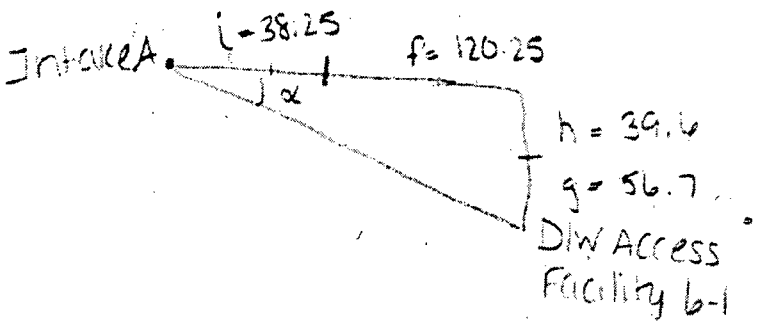
$90° - 80.2° = 9.8°$ from plant north

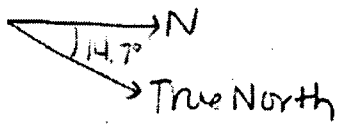
$9.8° - 14.7° = -4.9°$

$360 - 4.9° = 355.1°$

$\therefore$ 355° from True North

Direction from Intake A to D/W Access 6-1 (Item 6)





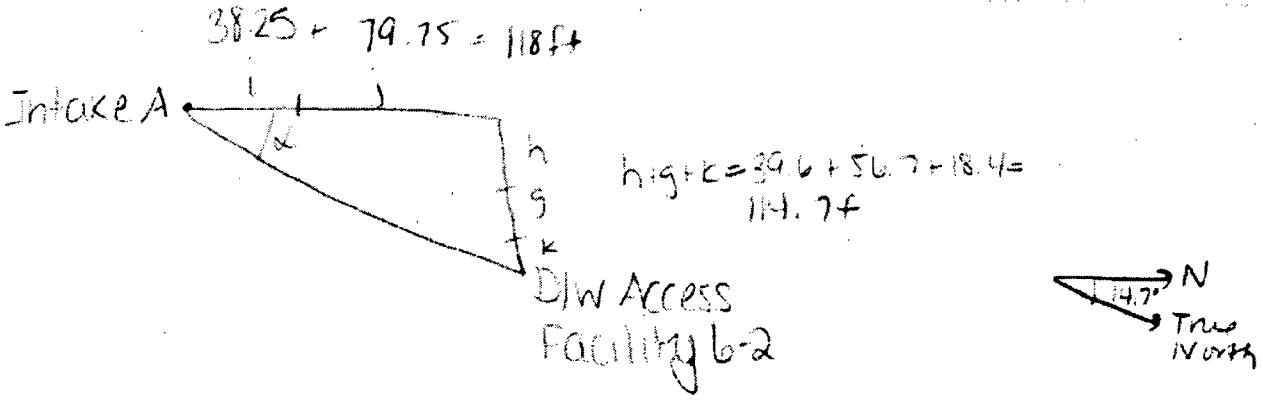
$$\tan \alpha = \frac{96.3}{158.5} = 0.6076$$

$\alpha = 31.3°$ from plant North

$31.3° - 14.7° = 16.6°$

$\therefore$ 17° from True North

Direction from Intake A to D/W Access 6-2 (Item 6)



$$\tan\alpha = \frac{h+g+k}{i+j} = \frac{114.7}{118} = 0.9720$$

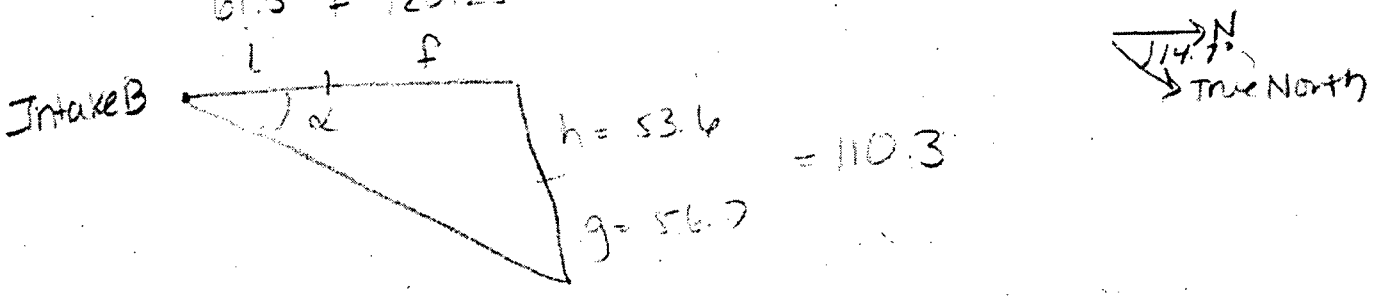
$\alpha = 44.2°$ from plant north

$44.2° - 14.7° = 29.5°$

$\therefore$ 30° from True North

Direction from Intake B to D/W Access 6-1 (Item 6)

61.5 + 120.25 = 181.75



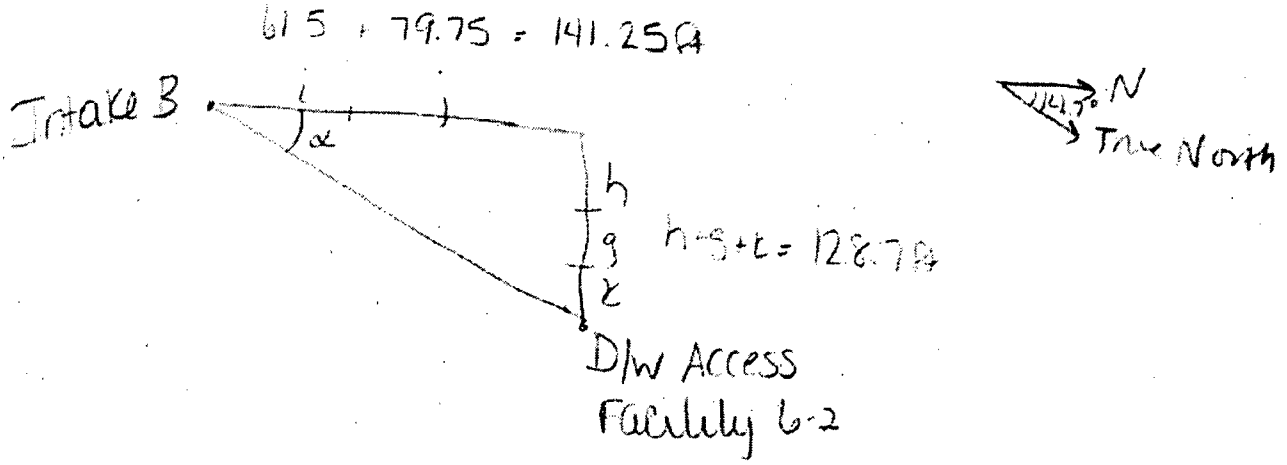
$$\tan\alpha = \frac{h+g}{L+f} = \frac{110.3}{181.75} = 0.6069$$

$\alpha = 31.3°$ from plant north

$31.3° - 14.7° = 16.6°$

$\therefore$ 17° from True North

Direction from Intake B to D/W Access 6-2 (Item 6)



$$\tan\alpha = \frac{h+g+k}{l+j} = \frac{128.7}{141.25} = 0.9112$$

$\alpha = 42.3°$ from plant north

$42.3 - 14.7 = 27.6°$

$\therefore$ 28° from True North

ARCON96 Input and Output

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Reactor Building Roof Hatch to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   44.50
  2323.00
    0.00
    0.00
    0.00
 121  90
   58.60
   44.50
    0.00
OYS1.log
OYS1.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/ 4/2007 at 15:18:19

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 44.5
Building Area (m^2) = 2323.0
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) = 121
Wind direction sector width (deg) = 90
Wind direction window (deg) = 076 - 166
Distance to intake (m) = 58.6
Intake height (m) = 44.5
Terrain elevation difference (m) = .0

Output file names
OYS1.log

OYS1.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6525
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 742
Hours direction not in window or calm = 34946

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	7267.	8928.	11295.	14833.	17751.	23938.	37831.	39677.	39674.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	32.	0.
ZERO	34946.	33234.	30769.	27040.	24229.	17918.	3181.	772.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.22	21.18	26.85	35.42	42.28	57.19	92.24	98.09	100.00	100.00

95th PERCENTILE X/Q VALUES

1.49E-03 1.31E-03 1.17E-03 1.03E-03 8.29E-04 5.73E-04 3.11E-04 2.60E-04 2.08E-04 1.89E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.49E-03
2 to 8 hours 8.73E-04
8 to 24 hours 3.46E-04
1 to 4 days 2.24E-04
4 to 30 days 1.70E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.33E-03	1.32E-04
SECTOR-AVERAGE	1.36E-03	7.69E-05

NORMAL PROGRAM COMPLETION

Reactor Building Roof Hatch to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   44.50
  2341.00
    0.00
    0.00
    0.00
 110  90
   52.50
   44.50
    0.00
OYS2.log
OYS2.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/ 4/2007 at 15:21:12

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 44.5
Building Area (m^2) = 2341.0
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) = 110
Wind direction sector width (deg) = 90
Wind direction window (deg) = 065 - 155
Distance to intake (m) = 52.5
Intake height (m) = 44.5
Terrain elevation difference (m) = .0

Output file names
OYS2.log

OYS2.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6726
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 742
Hours direction not in window or calm = 34745

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	7468.	9109.	11436.	14868.	17716.	23687.	37529.	39501.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34745.	33053.	30628.	27005.	24264.	18169.	3483.	948.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.69	21.60	27.19	35.51	42.20	56.59	91.51	97.66	100.00	100.00

95th PERCENTILE X/Q VALUES

1.82E-03 1.58E-03 1.43E-03 1.28E-03 1.03E-03 7.13E-04 3.81E-04 3.19E-04 2.57E-04 2.28E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.82E-03
2 to 8 hours 1.09E-03
8 to 24 hours 4.32E-04
1 to 4 days 2.71E-04
4 to 30 days 2.04E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.88E-03	1.62E-04
SECTOR-AVERAGE	1.68E-03	9.45E-05

NORMAL PROGRAM COMPLETION

Stack Tunnel Door to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    0.00
  2303.00
    0.00
    0.00
    0.00
 102  90
   80.90
    0.00
    0.00
OYS3.log
OYS3.cfd
 .2
    0.50
    4.30
  1  2  4  8  12 .24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/ 4/2007 at 15:22:19

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2303.0
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) = 102
Wind direction sector width (deg) = 90
Wind direction window (deg) = 057 - 147
Distance to intake (m) = 80.9
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
OYS3.log

OYS3.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6389
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35143

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.	0.	0.	0.	0.	0.	0.
IN RANGE	7070.	8865.	11345.	14988.	17929.	24018.	37566.	39422.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35143.	33297.	30719.	26885.	24051.	17838.	3446.	1027.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.75	21.03	26.97	35.79	42.71	57.38	91.60	97.46	100.00	100.00

95th PERCENTILE X/Q VALUES

7.70E-04 6.68E-04 5.96E-04 5.26E-04 4.26E-04 2.94E-04 1.68E-04 1.40E-04 1.10E-04 9.79E-05

95% X/Q for standard averaging intervals

0 to 2 hours 7.70E-04
2 to 8 hours 4.44E-04
8 to 24 hours 1.78E-04
1 to 4 days 1.26E-04
4 to 30 days 8.71E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.25E-03	1.39E-04
SECTOR-AVERAGE	7.28E-04	8.10E-05

NORMAL PROGRAM COMPLETION

Stack Tunnel Door to Intake A (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    0.00
 2032.00
    0.00
    0.00
    0.00
 144  90
   80.90
    0.00
    0.00
OYS4.log
OYS4.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/ 5/2007 at 11:06:28

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2032.0
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) = 144
Wind direction sector width (deg) = 90
Wind direction window (deg) = 099 - 189
Distance to intake (m) = 80.9
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
OYS4.log

OYS4.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 7416
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34116

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.	0.	0.	0.	0.	0.	0.
IN RANGE	8097.	10157.	12816.	16568.	19589.	25644.	38323.	39750.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34116.	32005.	29248.	25305.	22391.	16212.	2689.	699.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	19.18	24.09	30.47	39.57	46.66	61.27	93.44	98.27	100.00	100.00

95th PERCENTILE X/Q VALUES

8.19E-04	7.27E-04	6.36E-04	5.54E-04	4.43E-04	3.08E-04	1.72E-04	1.44E-04	1.19E-04	1.06E-04

95% X/Q for standard averaging intervals

0 to 2 hours	8.19E-04
2 to 8 hours	4.66E-04
8 to 24 hours	1.85E-04
1 to 4 days	1.27E-04
4 to 30 days	9.64E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.25E-03	1.18E-04
SECTOR-AVERAGE	7.31E-04	6.86E-05

NORMAL PROGRAM COMPLETION

Stack Tunnel Door to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    0.00
 2231.00
    0.00
    0.00
    0.00
 95  90
   77.30
    0.00
    0.00
OYS5.log
OYS5.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/ 5/2007 at 09:42:23

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2231.0
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) = 095
Wind direction sector width (deg) = 90
Wind direction window (deg) = 050 - 140
Distance to intake (m) = 77.3
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
OYS5.log

OYS5.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6488
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35044

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	7169.	8916.	11348.	14943.	17869.	23796.	37395.	39446.	39703.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	3.	3.	0.
ZERO	35044.	33246.	30716.	26930.	24111.	18060.	3617.	1000.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.98	21.15	26.98	35.69	42.57	56.85	91.18	97.53	100.00	100.00

95th PERCENTILE X/Q VALUES

8.55E-04	7.62E-04	6.84E-04	6.05E-04	4.87E-04	3.38E-04	1.92E-04	1.59E-04	1.28E-04	1.07E-04

95% X/Q for standard averaging intervals

0 to 2 hours	8.55E-04
2 to 8 hours	5.21E-04
8 to 24 hours	2.05E-04
1 to 4 days	1.44E-04
4 to 30 days	9.42E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.36E-03	1.51E-04
SECTOR-AVERAGE	7.95E-04	8.81E-05

NORMAL PROGRAM COMPLETION

Stack Tunnel Door to Intake B (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    0.00
 2244.00
    0.00
    0.00
    0.00
 130  90
   77.30
    0.00
    0.00
OYS6.log
OYS6.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/ 5/2007 at 11:09:10

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = .0
Building Area (m^2) = 2244.0
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) = 130
Wind direction sector width (deg) = 90
Wind direction window (deg) = 085 - 175
Distance to intake (m) = 77.3
Intake height (m) = .0
Terrain elevation difference (m) = .0

Output file names
OYS6.log

OYS6.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6302
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35230

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	6983.	8885.	11499.	15272.	18292.	24436.	37875.	39618.	39703.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	1.	3.	0.
ZERO	35230.	33277.	30565.	26601.	23688.	17420.	3137.	830.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.54	21.07	27.34	36.47	43.57	58.38	92.35	97.95	100.00	100.00

95th PERCENTILE X/Q VALUES

8.29E-04 7.03E-04 6.20E-04 5.40E-04 4.33E-04 3.02E-04 1.67E-04 1.40E-04 1.16E-04 1.02E-04

95% X/Q for standard averaging intervals

0 to 2 hours	8.29E-04
2 to 8 hours	4.43E-04
8 to 24 hours	1.84E-04
1 to 4 days	1.22E-04
4 to 30 days	9.21E-05

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.37E-03	1.47E-04
SECTOR-AVERAGE	7.97E-04	8.58E-05

NORMAL PROGRAM COMPLETION

D/W Access Facility (West Door) to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.10
 2191.00
    0.00
    0.00
    0.00
 17  90
   58.00
    1.10
    0.00
OYS15.log
OYS15.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:19:22

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2191.0
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) = 017
Wind direction sector width (deg) = 90
Wind direction window (deg) = 332 - 062
Distance to intake (m) = 58.0
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS15.log

OYS15.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6910
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34622

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	7591.	9669.	12521.	16687.	20036.	26644.	38909.	40051.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34622.	32493.	29543.	25186.	21944.	15212.	2103.	398.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.98	22.93	29.77	39.85	47.73	63.66	94.87	99.02	100.00	100.00

95th PERCENTILE X/Q VALUES

1.61E-03 1.53E-03 1.42E-03 1.30E-03 1.07E-03 7.56E-04 4.09E-04 3.38E-04 2.89E-04 2.28E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.61E-03
2 to 8 hours	1.20E-03
8 to 24 hours	4.83E-04
1 to 4 days	2.94E-04
4 to 30 days	2.00E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.38E-03	2.46E-04
SECTOR-AVERAGE	1.39E-03	1.43E-04

NORMAL PROGRAM COMPLETION

D/W Access Facility (South Door) to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
   2
   1
    1.10
  2324.00
    0.00
    0.00
    0.00
  30  90
   51.90
    1.10
    0.00
OYS16.log
OYS16.cfd
 .2
    0.50
    4.30
   1   2   4   8  12  24  96 168 360 720
   1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/25/2007 at 13:20:11

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2324.0
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) = 030
Wind direction sector width (deg) = 90
Wind direction window (deg) = 345 - 075
Distance to intake (m) = 51.9
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS16.log

OYS16.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6535
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34997

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	7216.	8991.	11443.	15038.	18026.	24127.	38037.	39888.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34997.	33171.	30621.	26835.	23954.	17729.	2975.	561.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.09	21.32	27.20	35.91	42.94	57.64	92.75	98.61	100.00	100.00

95th PERCENTILE X/Q VALUES

1.93E-03	1.84E-03	1.72E-03	1.57E-03	1.30E-03	9.34E-04	5.05E-04	4.22E-04	3.72E-04	2.89E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.93E-03
2 to 8 hours	1.45E-03
8 to 24 hours	6.16E-04
1 to 4 days	3.61E-04
4 to 30 days	2.55E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.95E-03	3.78E-04
SECTOR-AVERAGE	1.72E-03	2.20E-04

NORMAL PROGRAM COMPLETION

D/W Access Facility (West Door) to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.10
 2191.00
    0.00
    0.00
    0.00
 17  90
   67.00
    1.10
    0.00
OYS17.log
OYS17.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:21:07

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2191.0
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) = 017
Wind direction sector width (deg) = 90
Wind direction window (deg) = 332 - 062
Distance to intake (m) = 67.0
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS17.log

OYS17.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6910
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34622

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	7591.	9669.	12521.	16687.	20036.	26644.	38909.	40051.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34622.	32493.	29543.	25186.	21944.	15212.	2103.	398.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.98	22.93	29.77	39.85	47.73	63.66	94.87	99.02	100.00	100.00

95th PERCENTILE X/Q VALUES

1.22E-03 1.17E-03 1.08E-03 9.91E-04 8.12E-04 5.76E-04 3.12E-04 2.59E-04 2.20E-04 1.74E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.22E-03
2 to 8 hours	9.13E-04
8 to 24 hours	3.69E-04
1 to 4 days	2.24E-04
4 to 30 days	1.53E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.80E-03	1.88E-04
SECTOR-AVERAGE	1.05E-03	1.10E-04

NORMAL PROGRAM COMPLETION

D/W Access Facility (South Door) to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
  10.00
  45.70
 2
 1
   1.10
 2311.00
   0.00
   0.00
   0.00
 28  90
  60.70
   1.10
   0.00
OYS18.log
OYS18.cfd
 .2
   0.50
   4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
   0.00    0.00
n
```

Program Title: ARCON96.

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

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

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e-mail: jyl1@nrc.gov
J. J. Hayes Phone: (301) 415 3167
e-mail: jjh@nrc.gov
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/25/2007 at 13:22:00

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2311.0
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) = 028
Wind direction sector width (deg) = 90
Wind direction window (deg) = 343 - 073
Distance to intake (m) = 60.7
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS18.log

OYS18.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6539
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34993

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	7220.	9070.	11612.	15276.	18324.	24506.	38202.	39928.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34993.	33092.	30452.	26597.	23656.	17350.	2810.	521.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.10	21.51	27.61	36.48	43.65	58.55	93.15	98.71	100.00	100.00

95th PERCENTILE X/Q VALUES

1.45E-03 1.37E-03 1.27E-03 1.17E-03 9.64E-04 6.88E-04 3.70E-04 3.12E-04 2.74E-04 2.12E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.45E-03
2 to 8 hours	1.08E-03
8 to 24 hours	4.47E-04
1 to 4 days	2.65E-04
4 to 30 days	1.87E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.18E-03	2.82E-04
SECTOR-AVERAGE	1.27E-03	1.65E-04

NORMAL PROGRAM COMPLETION

East Airlock Door to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.20
  1875.00
    0.00
    0.00
    0.00
  74  90
   61.50
    1.20
    0.00
OYS7.log
OYS7.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/ 5/2007 at 09:45:32

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.2
Building Area (m^2) = 1875.0
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) = 074
Wind direction sector width (deg) = 90
Wind direction window (deg) = 029 - 119
Distance to intake (m) = 61.5
Intake height (m) = 1.2
Terrain elevation difference (m) = .0

Output file names
OYS7.log

OYS7.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6692
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34840

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	7373.	8951.	11186.	14500.	17246.	22777.	37010.	39401.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34840.	33211.	30878.	27373.	24734.	19079.	4002.	1048.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.47	21.23	26.59	34.63	41.08	54.42	90.24	97.41	100.00	100.00

95th PERCENTILE X/Q VALUES

1.37E-03	1.30E-03	1.18E-03	1.07E-03	8.69E-04	6.20E-04	3.55E-04	2.75E-04	2.32E-04	1.88E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.37E-03
2 to 8 hours	9.67E-04
8 to 24 hours	3.96E-04
1 to 4 days	2.66E-04
4 to 30 days	1.63E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.13E-03	2.32E-04
SECTOR-AVERAGE	1.24E-03	1.35E-04

NORMAL PROGRAM COMPLETION

East Airlock Door to Intake A (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.20
  2334.00
    0.00
    0.00
    0.00
  31  90
   61.50
    1.20
    0.00
OYS8.log
OYS8.cfd
 .2
    0.50
    4.30
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/ 5/2007 at 11:08:37

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.2
Building Area (m^2) = 2334.0
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) = 031
Wind direction sector width (deg) = 90
Wind direction window (deg) = 346 - 076
Distance to intake (m) = 61.5
Intake height (m) = 1.2
Terrain elevation difference (m) = .0

Output file names
OYS8.log

OYS8.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6544
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34988

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	7225.	8975.	11402.	14989.	17964.	24021.	38009.	39889.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34988.	33187.	30662.	26884.	24016.	17835.	3003.	560.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.12	21.29	27.11	35.80	42.79	57.39	92.68	98.62	100.00	100.00

95th PERCENTILE X/Q VALUES

1.40E-03 1.34E-03 1.25E-03 1.15E-03 9.46E-04 6.76E-04 3.66E-04 3.04E-04 2.72E-04 2.07E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.40E-03
2 to 8 hours	1.06E-03
8 to 24 hours	4.41E-04
1 to 4 days	2.63E-04
4 to 30 days	1.83E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.12E-03	2.71E-04
SECTOR-AVERAGE	1.24E-03	1.58E-04

NORMAL PROGRAM COMPLETION

East Airlock Door to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.20
  2071.00
    0.00
    0.00
    0.00
  66  90
   70.30
    1.20
    0.00
OYS9.log
OYS9.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:22:47

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.2
Building Area (m^2) = 2071.0
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) = 70.3
Intake height (m) = 1.2
Terrain elevation difference (m) = .0

Output file names
OYS9.log

OYS9.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6746
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34786

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	7427.	8977.	11167.	14405.	17065.	22455.	36850.	39383.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34786.	33185.	30897.	27468.	24915.	19401.	4162.	1066.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.59	21.29	26.55	34.40	40.65	53.65	89.85	97.36	100.00	100.00

95th PERCENTILE X/Q VALUES

1.08E-03 1.02E-03 9.45E-04 8.58E-04 7.02E-04 5.04E-04 2.91E-04 2.21E-04 1.96E-04 1.56E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.08E-03
2 to 8 hours 7.85E-04
8 to 24 hours 3.27E-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	1.64E-03	1.80E-04
SECTOR-AVERAGE	9.58E-04	1.05E-04

NORMAL PROGRAM COMPLETION

East Airlock Door to Intake B (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.20
  2303.00
    0.00
    0.00
    0.00
  26  90
   70.30
    1.20
    0.00
OYS10.log
OYS10.cfd
 .2
   0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:24:53

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.2
Building Area (m^2) = 2303.0
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) = 026
Wind direction sector width (deg) = 90
Wind direction window (deg) = 341 - 071
Distance to intake (m) = 70.3
Intake height (m) = 1.2
Terrain elevation difference (m) = .0

Output file names
OYS10.log

OYS10.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6539
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34993

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	7220.	9111.	11703.	15441.	18530.	24797.	38393.	39936.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34993.	33051.	30361.	26432.	23450.	17059.	2619.	513.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.10	21.61	27.82	36.88	44.14	59.24	93.61	98.73	100.00	100.00

95th PERCENTILE X/Q VALUES

1.10E-03 1.04E-03 9.68E-04 8.89E-04 7.31E-04 5.20E-04 2.79E-04 2.36E-04 2.08E-04 1.62E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.10E-03
2 to 8 hours	8.18E-04
8 to 24 hours	3.36E-04
1 to 4 days	1.98E-04
4 to 30 days	1.44E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.64E-03	2.15E-04
SECTOR-AVERAGE	9.57E-04	1.25E-04

NORMAL PROGRAM COMPLETION

Reactor Building Wall to Intake A (Diffuse Area)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   28.00
  1632.00
    0.00
    0.00
    0.00
 93  90
    7.90
   13.70
    0.00
OYS11.log
OYS11.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    8.30    5.50
n
```

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

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Program Run 9/ 6/2007 at 11:29:35

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 28.0
Building Area (m^2) = 1632.0
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) = 093
Wind direction sector width (deg) = 90
Wind direction window (deg) = 048 - 138
Distance to intake (m) = 7.9
Intake height (m) = 13.7
Terrain elevation difference (m) = .0

Output file names
OYS11.log

OYS11.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = 8.30
Initial value of sigma z = 5.50

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 1611
Hours direction in window = 6920
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 819
Hours direction not in window or calm = 34474

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	7739.	9425.	11774.	15266.	18084.	23838.	37601.	39527.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34474.	32737.	30290.	26607.	23896.	18018.	3411.	922.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	18.33	22.35	27.99	36.46	43.08	56.95	91.68	97.72	100.00	100.00

95th PERCENTILE X/Q VALUES

2.05E-03 1.78E-03 1.66E-03 1.47E-03 1.20E-03 8.60E-04 4.84E-04 4.14E-04 3.47E-04 3.22E-04

95% X/Q for standard averaging intervals

0 to 2 hours 2.05E-03
2 to 8 hours 1.27E-03
8 to 24 hours 5.56E-04
1 to 4 days 3.59E-04
4 to 30 days 2.97E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	3.71E-03	2.68E-04
SECTOR-AVERAGE	2.16E-03	1.56E-04

NORMAL PROGRAM COMPLETION

Reactor Building Wall to Intake A (Diffuse Area; Alternate Release Height, σ_z, and Projected Area)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   22.30
 2205.00
    0.00
    0.00
    0.00
 93  90
    7.90
   13.70
    0.00
OYS12.log
OYS12.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    8.30    7.40
n
```

Program Title: ARCON96.

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

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

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e-mail: jyl1@nrc.gov
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 6/2007 at 11:32:11

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 22.3
Building Area (m^2) = 2205.0
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) = 093
Wind direction sector width (deg) = 90
Wind direction window (deg) = 048 - 138
Distance to intake (m) = 7.9
Intake height (m) = 13.7
Terrain elevation difference (m) = .0

Output file names
OYS12.log

OYS12.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = 8.30
Initial value of sigma z = 7.40

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 1611
Hours direction in window = 6505
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35027

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	7186.	8949.	11393.	14995.	17914.	23796.	37482.	39464.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35027.	33213.	30671.	26878.	24066.	18060.	3530.	985.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.02	21.23	27.08	35.81	42.67	56.85	91.39	97.56	100.00	100.00

95th PERCENTILE X/Q VALUES

1.65E-03 1.70E-03 1.37E-03 1.25E-03 1.02E-03 7.56E-04 4.30E-04 3.81E-04 3.31E-04 3.35E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.70E-03
2 to 8 hours	1.10E-03
8 to 24 hours	5.08E-04
1 to 4 days	3.22E-04
4 to 30 days	3.21E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	4.22E-03	3.00E-04
SECTOR-AVERAGE	2.57E-03	1.75E-04

NORMAL PROGRAM COMPLETION

Reactor Building Wall to Intake B (Diffuse Area)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   28.00
  1456.00
    0.00
    0.00
    0.00
  79  90
   15.10
   18.10
    0.00
OYS13.log
OYS13.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    7.40    5.50
n
```

Program Title: ARCON96.

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

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

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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

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Program Run 9/ 6/2007 at 11:33:13

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 28.0
Building Area (m^2) = 1456.0
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) = 079
Wind direction sector width (deg) = 90
Wind direction window (deg) = 034 - 124
Distance to intake (m) = 15.1
Intake height (m) = 18.1
Terrain elevation difference (m) = .0

Output file names
OYS13.log

OYS13.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = 7.40
Initial value of sigma z = 5.50

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 1611
Hours direction in window = 7137
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 819
Hours direction not in window or calm = 34257

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	7956.	9463.	11615.	14832.	17511.	22962.	37223.	39475.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34257.	32699.	30449.	27041.	24469.	18894.	3789.	974.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	18.85	22.44	27.61	35.42	41.71	54.86	90.76	97.59	100.00	100.00

95th PERCENTILE X/Q VALUES

2.15E-03 1.65E-03 1.58E-03 1.47E-03 1.19E-03 8.58E-04 5.03E-04 4.33E-04 3.53E-04 3.11E-04

95% X/Q for standard averaging intervals

0 to 2 hours	2.15E-03
2 to 8 hours	1.25E-03
8 to 24 hours	5.51E-04
1 to 4 days	3.84E-04
4 to 30 days	2.81E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	3.44E-03	2.67E-04
SECTOR-AVERAGE	2.01E-03	1.56E-04

NORMAL PROGRAM COMPLETION

Reactor Building Wall to Intake B (Diffuse Area; Alternate Release Height, σ_z, and Projected Area))

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
   22.30
 1968.00
    0.00
    0.00
    0.00
 79  90
   15.10
   18.10
    0.00
OYS14.log
OYS14.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    7.40    7.40
n
```

Program Title: ARCON96.

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

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

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e-mail: jyl1@nrc.gov
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/ 6/2007 at 11:33:50

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 22.3
Building Area (m^2) = 1968.0
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) = 079
Wind direction sector width (deg) = 90
Wind direction window (deg) = 034 - 124
Distance to intake (m) = 15.1
Intake height (m) = 18.1
Terrain elevation difference (m) = .0

Output file names
OYS14.log

OYS14.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

Initial value of sigma y = 7.40
Initial value of sigma z = 7.40

Expanded output for code testing not selected

Total number of hours of data processed = 43824
Hours of missing data = 1611
Hours direction in window = 6706
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34826

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	7387.	9012.	11263.	14620.	17395.	23010.	37258.	39477.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34826.	33150.	30801.	27253.	24585.	18846.	3754.	972.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.50	21.37	26.78	34.92	41.44	54.97	90.85	97.60	100.00	100.00

95th PERCENTILE X/Q VALUES

1.64E-03 1.49E-03 1.33E-03 1.16E-03 9.48E-04 6.95E-04 4.06E-04 3.49E-04 2.87E-04 2.65E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.64E-03
2 to 8 hours 1.01E-03
8 to 24 hours 4.60E-04
1 to 4 days 3.10E-04
4 to 30 days 2.43E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	3.13E-03	3.03E-04
SECTOR-AVERAGE	1.82E-03	1.76E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building South Wall to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    2.00
  2337.00
    0.00
    0.00
    0.00
 118  90
   55.30
    2.00
    0.00
OYS19.log
OYS19.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

Program Title: ARCON96.

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

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

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Program Run 9/25/2007 at 13:26:13

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 2.0
Building Area (m^2) = 2337.0
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) = 118
Wind direction sector width (deg) = 90
Wind direction window (deg) = 073 - 163
Distance to intake (m) = 55.3
Intake height (m) = 2.0
Terrain elevation difference (m) = .0

Output file names
OYS19.log

OYS19.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6277
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35255

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	6958.	8830.	11398.	15088.	18097.	24278.	37999.	39613.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35255.	33332.	30666.	26785.	23883.	17578.	3013.	836.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.48	20.94	27.10	36.03	43.11	58.00	92.65	97.93	100.00	100.00

95th PERCENTILE X/Q VALUES

1.55E-03 1.31E-03 1.16E-03 1.02E-03 8.26E-04 5.78E-04 3.18E-04 2.59E-04 2.17E-04 1.92E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.55E-03
2 to 8 hours 8.44E-04
8 to 24 hours 3.56E-04
1 to 4 days 2.31E-04
4 to 30 days 1.73E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.57E-03	2.82E-04
SECTOR-AVERAGE	1.50E-03	1.64E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building South Wall to Intake A (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    2.00
  2032.00
    0.00
    0.00
    0.00
 144  90
   55.30
    2.00
    0.00
OYS20.log
OYS20.cfd
 .2
    0.50
    4.30
  1   2   4   8  12  24  96 168 360 720
  1   2   4   8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/25/2007 at 13:27:08

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 2.0
Building Area (m^2) = 2032.0
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) = 144
Wind direction sector width (deg) = 90
Wind direction window (deg) = 099 - 189
Distance to intake (m) = 55.3
Intake height (m) = 2.0
Terrain elevation difference (m) = .0

Output file names
OYS20.log

OYS20.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 7416
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34116

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	8097.	10157.	12816.	16568.	19589.	25644.	38323.	39750.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34116.	32005.	29248.	25305.	22391.	16212.	2689.	699.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	19.18	24.09	30.47	39.57	46.66	61.27	93.44	98.27	100.00	100.00

95th PERCENTILE X/Q VALUES

1.67E-03 1.49E-03 1.30E-03 1.13E-03 9.01E-04 6.26E-04 3.52E-04 2.95E-04 2.42E-04 2.16E-04

95% X/Q for standard averaging intervals

0 to 2 hours	1.67E-03
2 to 8 hours	9.50E-04
8 to 24 hours	3.74E-04
1 to 4 days	2.60E-04
4 to 30 days	1.95E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.61E-03	2.39E-04
SECTOR-AVERAGE	1.52E-03	1.39E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building South Wall to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    2.00
 2334.00
    0.00
    0.00
    0.00
 107  90
   51.70
    2.00
    0.00
OYS21.log
OYS21.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:28:16

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 2.0
Building Area (m^2) = 2334.0
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) = 107
Wind direction sector width (deg) = 90
Wind direction window (deg) = 062 - 152
Distance to intake (m) = 51.7
Intake height (m) = 2.0
Terrain elevation difference (m) = .0

Output file names
OYS21.log

OYS21.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6327
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35205

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	7008.	8762.	11229.	14857.	17802.	23945.	37717.	39472.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35205.	33400.	30835.	27016.	24178.	17911.	3295.	977.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.60	20.78	26.70	35.48	42.41	57.21	91.97	97.58	100.00	100.00

95th PERCENTILE X/Q VALUES

1.76E-03 1.52E-03 1.34E-03 1.19E-03 9.65E-04 6.65E-04 3.76E-04 3.11E-04 2.50E-04 2.24E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.76E-03
2 to 8 hours 9.97E-04
8 to 24 hours 4.03E-04
1 to 4 days 2.80E-04
4 to 30 days 2.01E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.93E-03	3.19E-04
SECTOR-AVERAGE	1.71E-03	1.86E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building South Wall to Intake B (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    2.00
  2244.00
    0.00
    0.00
    0.00
 130  90
   51.70
    2.00
    0.00
OYS22.log
OYS22.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:29:00

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 2.0
Building Area (m^2) = 2244.0
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) = 130
Wind direction sector width (deg) = 90
Wind direction window (deg) = 085 - 175
Distance to intake (m) = 51.7
Intake height (m) = 2.0
Terrain elevation difference (m) = .0

Output file names
OYS22.log

OYS22.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6302
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35230

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	6983.	8885.	11499.	15272.	18292.	24436.	37875.	39619.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35230.	33277.	30565.	26601.	23688.	17420.	3137.	830.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	16.54	21.07	27.34	36.47	43.57	58.38	92.35	97.95	100.00	100.00

95th PERCENTILE X/Q VALUES

1.77E-03 1.49E-03 1.32E-03 1.15E-03 9.21E-04 6.40E-04 3.55E-04 2.95E-04 2.45E-04 2.14E-04

95% X/Q for standard averaging intervals

0 to 2 hours 1.77E-03
2 to 8 hours 9.38E-04
8 to 24 hours 3.88E-04
1 to 4 days 2.59E-04
4 to 30 days 1.93E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	2.97E-03	3.11E-04
SECTOR-AVERAGE	1.73E-03	1.81E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building North Wall to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.14
 2318.00
    0.00
    0.00
    0.00
 47  90
   30.90
    1.14
    0.00
OYS23.log
OYS23.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:29:55

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2318.0
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) = 047
Wind direction sector width (deg) = 90
Wind direction window (deg) = 002 - 092
Distance to intake (m) = 30.9
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS23.log

OYS23.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6712
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34820

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	7393.	8942.	11151.	14446.	17187.	22816.	37295.	39583.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34820.	33220.	30913.	27427.	24793.	19040.	3717.	866.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.51	21.21	26.51	34.50	40.94	54.51	90.94	97.86	100.00	100.00

95th PERCENTILE X/Q VALUES

5.17E-03 4.97E-03 4.67E-03 4.31E-03 3.53E-03 2.55E-03 1.43E-03 1.11E-03 1.01E-03 7.99E-04

95% X/Q for standard averaging intervals

0 to 2 hours	5.17E-03
2 to 8 hours	4.02E-03
8 to 24 hours	1.68E-03
1 to 4 days	1.06E-03
4 to 30 days	7.01E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	8.09E-03	8.34E-04
SECTOR-AVERAGE	4.72E-03	4.86E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building North Wall to Intake A (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.14
  2334.00
    0.00
    0.00
    0.00
  31  90
   30.90
    1.14
    0.00
OYS24.log
OYS24.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

Program Title: ARCON96.

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

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

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e-mail: jyl1@nrc.gov
J. J. Hayes Phone: (301) 415 3167
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
e-mail: j_ramsdell@pnl.gov

Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/25/2007 at 13:30:41

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2334.0
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) = 031
Wind direction sector width (deg) = 90
Wind direction window (deg) = 346 - 076
Distance to intake (m) = 30.9
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS24.log

OYS24.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6544
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34988

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	7225.	8975.	11402.	14989.	17964.	24021.	38009.	39889.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34988.	33187.	30662.	26884.	24016.	17835.	3003.	560.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.12	21.29	27.11	35.80	42.79	57.39	92.68	98.62	100.00	100.00

95th PERCENTILE X/Q VALUES

5.21E-03 4.96E-03 4.61E-03 4.24E-03 3.50E-03 2.50E-03 1.35E-03 1.13E-03 1.00E-03 7.71E-04

95% X/Q for standard averaging intervals

0 to 2 hours 5.21E-03
2 to 8 hours 3.91E-03
8 to 24 hours 1.63E-03
1 to 4 days 9.67E-04
4 to 30 days 6.82E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	8.09E-03	9.79E-04
SECTOR-AVERAGE	4.72E-03	5.71E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building North Wall to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.14
  2345.00
    0.00
    0.00
    0.00
  39  90
   39.70
    1.14
    0.00
OYS25.log
OYS25.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:31:54

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2345.0
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) = 039
Wind direction sector width (deg) = 90
Wind direction window (deg) = 354 - 084
Distance to intake (m) = 39.7
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS25.log

OYS25.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6650
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34882

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	7331.	8934.	11192.	14531.	17301.	23073.	37364.	39593.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34882.	33228.	30872.	27342.	24679.	18783.	3648.	856.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.37	21.19	26.61	34.70	41.21	55.12	91.11	97.88	100.00	100.00

95th PERCENTILE X/Q VALUES

3.20E-03	3.09E-03	2.90E-03	2.68E-03	2.20E-03	1.59E-03	8.81E-04	7.12E-04	6.41E-04	4.91E-04

95% X/Q for standard averaging intervals

0 to 2 hours	3.20E-03
2 to 8 hours	2.51E-03
8 to 24 hours	1.05E-03
1 to 4 days	6.43E-04
4 to 30 days	4.31E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	4.96E-03	6.13E-04
SECTOR-AVERAGE	2.89E-03	3.58E-04

NORMAL PROGRAM COMPLETION

Commodities Penetration on the Reactor Building North Wall to Intake B (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.14
  2303.00
    0.00
    0.00
    0.00
  26  90
   39.70
    1.14
    0.00
OYS26.log
OYS26.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/25/2007 at 13:32:42

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.1
Building Area (m^2) = 2303.0
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) = 026
Wind direction sector width (deg) = 90
Wind direction window (deg) = 341 - 071
Distance to intake (m) = 39.7
Intake height (m) = 1.1
Terrain elevation difference (m) = .0

Output file names
OYS26.log

OYS26.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6539
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34993

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	7220.	9111.	11703.	15441.	18530.	24797.	38393.	39936.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34993.	33051.	30361.	26432.	23450.	17059.	2619.	513.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.10	21.61	27.82	36.88	44.14	59.24	93.61	98.73	100.00	100.00

95th PERCENTILE X/Q VALUES

3.22E-03	3.08E-03	2.86E-03	2.63E-03	2.16E-03	1.54E-03	8.22E-04	6.94E-04	6.11E-04	4.72E-04

95% X/Q for standard averaging intervals

0 to 2 hours	3.22E-03
2 to 8 hours	2.43E-03
8 to 24 hours	9.91E-04
1 to 4 days	5.84E-04
4 to 30 days	4.18E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	4.96E-03	6.22E-04
SECTOR-AVERAGE	2.89E-03	3.63E-04

NORMAL PROGRAM COMPLETION

MAC Facility Personnel Airlock to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.70
  2334.00
    0.00
    0.00
    0.00
  32  90
   26.90
    1.70
    0.00
OYS27.log
OYS27.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/28/2007 at 11:22:04

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.7
Building Area (m^2) = 2334.0
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) = 032
Wind direction sector width (deg) = 90
Wind direction window (deg) = 347 - 077
Distance to intake (m) = 26.9
Intake height (m) = 1.7
Terrain elevation difference (m) = .0

Output file names
OYS27.log

OYS27.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6546
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34986

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	18.	17.	15.	12.	0.	0.	0.	0.	0.	0.
IN RANGE	7209.	8933.	11320.	14856.	17801.	23831.	37986.	39892.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34986.	33212.	30729.	27005.	24179.	18025.	3026.	557.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.12	21.23	26.95	35.51	42.40	56.94	92.62	98.62	100.00	100.00

95th PERCENTILE X/Q VALUES

6.75E-03 6.45E-03 6.04E-03 5.54E-03 4.57E-03 3.27E-03 1.77E-03 1.47E-03 1.31E-03 9.94E-04

95% X/Q for standard averaging intervals

0 to 2 hours 6.75E-03
2 to 8 hours 5.13E-03
8 to 24 hours 2.14E-03
1 to 4 days 1.27E-03
4 to 30 days 8.74E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.06E-02	1.27E-03
SECTOR-AVERAGE	6.18E-03	7.39E-04

NORMAL PROGRAM COMPLETION

MAC Facility Personnel Airlock to Intake A (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.70
  2334.00
    0.00
    0.00
    0.00
  31  90
   26.90
    1.70
    0.00
OYS28.log
OYS28.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/28/2007 at 11:22:58

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.7
Building Area (m^2) = 2334.0
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) = 031
Wind direction sector width (deg) = 90
Wind direction window (deg) = 346 - 076
Distance to intake (m) = 26.9
Intake height (m) = 1.7
Terrain elevation difference (m) = .0

Output file names
OYS28.log

OYS28.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6544
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34988

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	18.	17.	15.	12.	0.	0.	0.	0.	0.	0.
IN RANGE	7207.	8958.	11387.	14977.	17964.	24021.	38009.	39889.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34988.	33187.	30662.	26884.	24016.	17835.	3003.	560.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.12	21.29	27.11	35.80	42.79	57.39	92.68	98.62	100.00	100.00

95th PERCENTILE X/Q VALUES

6.75E-03 6.45E-03 6.02E-03 5.51E-03 4.56E-03 3.26E-03 1.76E-03 1.47E-03 1.30E-03 9.96E-04

95% X/Q for standard averaging intervals

0 to 2 hours	6.75E-03
2 to 8 hours	5.10E-03
8 to 24 hours	2.13E-03
1 to 4 days	1.26E-03
4 to 30 days	8.78E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	1.06E-02	1.27E-03
SECTOR-AVERAGE	6.18E-03	7.39E-04

NORMAL PROGRAM COMPLETION

MAC Facility Personnel Airlock to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.70
 2311.00
    0.00
    0.00
    0.00
 27  90
   35.70
    1.70
    0.00
OYS29.log
OYS29.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/28/2007 at 11:24:01

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.7
Building Area (m^2) = 2311.0
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) = 027
Wind direction sector width (deg) = 90
Wind direction window (deg) = 342 - 072
Distance to intake (m) = 35.7
Intake height (m) = 1.7
Terrain elevation difference (m) = .0

Output file names
OYS29.log

OYS29.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6521
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 35011

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	7202.	9080.	11652.	15366.	18438.	24665.	38312.	39935.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	35011.	33082.	30412.	26507.	23542.	17191.	2700.	514.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.06	21.54	27.70	36.70	43.92	58.93	93.42	98.73	100.00	100.00

95th PERCENTILE X/Q VALUES

3.97E-03	3.76E-03	3.49E-03	3.21E-03	2.64E-03	1.88E-03	1.01E-03	8.47E-04	7.51E-04	5.77E-04

95% X/Q for standard averaging intervals

0 to 2 hours	3.97E-03
2 to 8 hours	2.95E-03
8 to 24 hours	1.22E-03
1 to 4 days	7.18E-04
4 to 30 days	5.10E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	6.10E-03	7.59E-04
SECTOR-AVERAGE	3.56E-03	4.42E-04

NORMAL PROGRAM COMPLETION

MAC Facility Personnel Airlock to Intake B (Redirected Flow)

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.70
  2303.00
    0.00
    0.00
    0.00
  26  90
   35.70
    1.70
    0.00
OYS30.log
OYS30.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00    0.00
n
```

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

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Program Run 9/28/2007 at 11:25:03

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.7
Building Area (m^2) = 2303.0
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) = 026
Wind direction sector width (deg) = 90
Wind direction window (deg) = 341 - 071
Distance to intake (m) = 35.7
Intake height (m) = 1.7
Terrain elevation difference (m) = .0

Output file names
OYS30.log

OYS30.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 6539
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 34993

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	7220.	9111.	11703.	15441.	18530.	24797.	38393.	39936.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	34993.	33051.	30361.	26432.	23450.	17059.	2619.	513.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	17.10	21.61	27.82	36.88	44.14	59.24	93.61	98.73	100.00	100.00

95th PERCENTILE X/Q VALUES

3.98E-03	3.77E-03	3.50E-03	3.21E-03	2.64E-03	1.88E-03	1.01E-03	8.45E-04	7.46E-04	5.81E-04

95% X/Q for standard averaging intervals

0 to 2 hours	3.98E-03
2 to 8 hours	2.96E-03
8 to 24 hours	1.21E-03
1 to 4 days	7.17E-04
4 to 30 days	5.15E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	6.10E-03	7.59E-04
SECTOR-AVERAGE	3.56E-03	4.42E-04

NORMAL PROGRAM COMPLETION

MAC Facility Entrance to Intake A

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.80
  1525.00
    0.00
    0.00
    0.00
 348  90
   28.40
    1.80
    0.00
OYS31.log
OYS31.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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

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Program Run 9/26/2007 at 14:35:48

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.8
Building Area (m^2) = 1525.0
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) = 348
Wind direction sector width (deg) = 90
Wind direction window (deg) = 303 - 033
Distance to intake (m) = 28.4
Intake height (m) = 1.8
Terrain elevation difference (m) = .0

Output file names
OYS31.log

OYS31.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 9662
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 31870

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	10343.	12960.	16434.	21290.	25265.	32358.	40663.	40434.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	31870.	29202.	25630.	20583.	16715.	9498.	349.	15.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	24.50	30.74	39.07	50.84	60.18	77.31	99.15	99.96	100.00	100.00

95th PERCENTILE X/Q VALUES

6.62E-03	6.35E-03	5.97E-03	5.44E-03	4.39E-03	3.09E-03	1.77E-03	1.46E-03	1.24E-03	1.11E-03

95% X/Q for standard averaging intervals

0 to 2 hours	6.62E-03
2 to 8 hours	5.05E-03
8 to 24 hours	1.92E-03
1 to 4 days	1.33E-03
4 to 30 days	1.01E-03

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	9.55E-03	5.89E-04
SECTOR-AVERAGE	5.57E-03	3.43E-04

NORMAL PROGRAM COMPLETION

MAC Facility Entrance to Intake B

```
5
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET
   10.00
   45.70
  2
  1
    1.80
  1739.00
    0.00
    0.00
    0.00
 355  90
   36.90
    1.80
    0.00
OYS32.log
OYS32.cfd
 .2
    0.50
    4.30
  1  2  4  8  12  24  96 168 360 720
  1  2  4  8  11  22  87 152 324 648
    0.00     0.00
n
```

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
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Code Developer: J. V. Ramsdell Phone: (509) 372 6316
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Code Documentation: NUREG/CR-6331 Rev. 1

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Program Run 9/26/2007 at 14:37:15

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

Number of Meteorological Data Files = 5
Meteorological Data File Names
C:\TRACI'~1\OYSTER~1\ARCON96\OYS95LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS96LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS97LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS98LL.MET
C:\TRACI'~1\OYSTER~1\ARCON96\OYS99LL.MET

Height of lower wind instrument (m) = 10.0
Height of upper wind instrument (m) = 45.7
Wind speeds entered as miles per hour

Ground-level release
Release height (m) = 1.8
Building Area (m^2) = 1739.0
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) = 355
Wind direction sector width (deg) = 90
Wind direction window (deg) = 310 - 040
Distance to intake (m) = 36.9
Intake height (m) = 1.8
Terrain elevation difference (m) = .0

Output file names
OYS32.log

OYS32.cfd

Minimum Wind Speed (m/s) = .5
Surface roughness length (m) = .20
Sector averaging constant = 4.3

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 = 43824
Hours of missing data = 1611
Hours direction in window = 8832
Hours elevated plume w/ dir. in window = 0
Hours of calm winds = 681
Hours direction not in window or calm = 32700

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	9513.	12080.	15496.	20238.	24074.	30953.	40566.	40430.	39706.	38691.
BELOW RANGE	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ZERO	32700.	30082.	26568.	21635.	17906.	10903.	446.	19.	0.	0.
TOTAL X/Qs	42213.	42162.	42064.	41873.	41980.	41856.	41012.	40449.	39706.	38691.
% NON ZERO	22.54	28.65	36.84	48.33	57.35	73.95	98.91	99.95	100.00	100.00

95th PERCENTILE X/Q VALUES

3.90E-03 3.79E-03 3.54E-03 3.21E-03 2.59E-03 1.80E-03 1.04E-03 8.50E-04 7.21E-04 6.27E-04

95% X/Q for standard averaging intervals

0 to 2 hours 3.90E-03
2 to 8 hours 2.97E-03
8 to 24 hours 1.10E-03
1 to 4 days 7.90E-04
4 to 30 days 5.63E-04

HOURLY VALUE RANGE

	MAX X/Q	MIN X/Q
CENTERLINE	5.73E-03	3.60E-04
SECTOR-AVERAGE	3.34E-03	2.10E-04

NORMAL PROGRAM COMPLETION

Computer Disclosure Sheet

Discipline Nuclear

Client:: Exelon Corporation
Project: Oyster Creek Generating Station

Date: October 2007
Job No.

Program(s) used	Rev No.	Rev. Date
ARCON96	1	5/1997

Calculation No.:C-1302-822-E310-081, Rev. 0
Status [ ] Prelim.
[X] Final
[ ] Void

WGI Prequalification [X] Yes
[ ] No

Run No. 1

Description: ARCON96 X/Q analysis consistent with procedures in Regulatory Guide 1.194 for Control Room habitability assessments.

Analysis Description: ARCON96 calculations of X/Q are performed for ground releases to Intakes A and B. Centerline X/Q values, sector X/Q values and 95% max X/Q values are computed for 0-2 hours, 2-8 hours and 8-24 hours, 1-4 days, and 4-30 days.

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

By:	On:
Run by: T.Thomas	10/5/07
Checked by: J. Robinson	10/5/07
Approved by: H. Rothstein	10/5/07

Remarks: WGI Form for Computer Software Control

ENCLOSURE 2

Oyster Creek Technical Specification Change Request No. 338

Markup of Proposed Technical Specifications and Bases Page Changes

Revised Technical Specifications & Bases Pages

1.0-8
3.5-5
3.5-6
3.5-7
3.5-8
3.5-11
3.5-12
3.5-12a
3.17-1
4.5-13

1.42 AVERAGE PLANAR LINEAR HEAT GENERATION RATE

The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) shall be applicable to a specific planar height and is equal to the sum of the heat generation rate per unit length of fuel rod for all the fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle at that height.

1.43 CORE OPERATING LIMITS REPORT

The Oyster Creek CORE OPERATING LIMITS REPORT (COLR) is the document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9.1.f. Plant operation within these operating limits is addressed in individual specifications.

1.44 LOCAL LINEAR HEAT GENERATION RATE

The LOCAL LINEAR HEAT GENERATION RATE (LLHGR) shall be applicable to a specific planar height and is equal to the AVERAGE PLANAR LINEAR GENERATION RATE (APLHGR) at the specified height multiplied by the local peaking factor at that height.

1.45 SHUTDOWN MARGIN (SDM)

SHUTDOWN MARGIN is the amount of reactivity by which the reactor would be subcritical when the control rod with the highest reactivity worth is fully withdrawn, all other operable control rods are fully inserted, all inoperable control rods are at their current position, reactor water temperature is 68§F, and the reactor fuel is xenon free. Determination of the control rod with the highest reactivity worth includes consideration of any inoperable control rods which are not fully inserted.

1.46 IDLE RECIRCULATION LOOP

A recirculation loop is idle when its discharge valve is in the closed position and its discharge bypass valve and suction valve are in the open position.

1.47 ISOLATED RECIRCULATION LOOP

A recirculation loop is fully isolated when the suction valve, discharge valve and discharge bypass valve are in the closed position.

1.48 OPERATIONAL CONDITION

The reactor plant operational status as to criticality, reactor mode switch position, reactor coolant temperature, and/or specific system status. These conditions consist of POWER OPERATION, STARTUP MODE, SHUTDOWN CONDITION, COLD SHUTDOWN CONDITION, and REFUEL MODE. A change or entry into an operating condition is signified by movement of the reactor mode switch or a change in reactor coolant temperature from <212°F to ≥212°F.

1.49 RECENTLY IRRADIATED FUEL

RECENTLY IRRADIATED FUEL is fuel that has occupied part of a critical reactor core within the previous 24 hours.

8. Shock Suppressors (Snubbers)

a. All safety related snubbers are required to be operable whenever the systems they protect are required to be operable except as noted in 3.5.A.8.b and c below.

b. With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to operable status.

c. If the requirements of 3.5.A.8.a and 3.5.A.8.b cannot be met, declare the protected system inoperable and follow the appropriate action statement for that system.

d. An engineering evaluation shall be performed to determine if the components protected by the snubber(s) were adversely affected by the inoperability of the snubber prior to returning the system to operable status.

B. Secondary Containment

1. Secondary containment integrity shall be maintained at all times unless all of the following conditions are met:

a. The reactor is subcritical and Specification 3.2.A is met.

b. The reactor is in the cold shutdown condition.

~~c. The reactor vessel head or the drywell head are in place.~~

c. ~~d.~~ No work is being performed on the reactor or its connected systems in the reactor building which ~~could result in inadvertent releases of radioactive material.~~ have the potential to drain the reactor vessel.

Deleted.

e. ~~No operations are being performed in, above, or around the spent fuel storage pool that could cause release of radioactive materials.~~

d. One of the following are met:
1) The reactor vessel head or the drywell head are in place.
2) The reactor has been subcritical for greater than 24 hours.

2. Upon the accidental loss of SECONDARY CONTAINMENT INTEGRITY, restore, SECONDARY CONTAINMENT INTEGRITY within 4 hours, except as provided in specification 3.5.B.3.

3. With one or more of the automatic secondary containment isolation valves inoperable:

   a. Maintain at least one automatic secondary containment isolation valve in each affected penetration OPERABLE.

   b. Within 8 hours restore the inoperable automatic secondary containment isolation valve(s) to OPERABLE status or isolate each affected penetration with at least one valve secured in the closed position.

4. If Specifications 3.5.B.2 or 3.5.B.3 cannot be met:

   a. During Power Operation:

      (1) Have the reactor mode switch in the shutdown mode position within the following 24 hours.

      (2) Cease all work on the reactor or its connected systems in the reactor building which could result in inadvertent releases of radioactive materials.

      (3) Cease all operations in, above or around the Spent Fuel Storage Pool that could cause release of radioactive materials.

   b. During refueling:

      (1) Cease fuel handling operations involving RECENTLY IRRADIATED FUEL. ~~or activities which could reduce the shutdown margin (excluding reactor coolant temperature changes).~~

      (2) Cease all work on the reactor or its connected systems in the reactor building which could result in ~~inadvertent releases of radioactive materials.~~ the potential to drain the reactor vessel.

      (3) Deleted. ~~Cease all operations in, above or around the Spent Fuel Storage Pool that could cause release of radioactive materials.~~

5. Two separate and independent standby gas treatment system circuits shall be operable when secondary containment is required except as specified by Specification 3.5.B.6.

6. With one standby gas treatment system circuit inoperable:

a. During Power Operation:

(1) Verify the operability of the other standby gas treatment system circuit within 2 hours. If testing is required to demonstrate operability and significant painting, fire, or chemical release has taken place in the reactor building within the previous 12 hours, then demonstration by testing shall take place within 1 hour of the expiration of the 12 hour period, and

(2) Continue to verify the operability of the standby gas treatment system circuit once per 24 hours until the inoperable standby gas treatment circuit is returned to operable status.

(3) Restore the inoperable standby gas treatment circuit to operable status within 7 days.

b. During Refueling:

(1) Verify the operability of the other standby gas treatment system within 2 hours. If testing is required to demonstrate operability and significant painting, fire, or chemical release has taken place in the reactor building within the previous 12 hours, then demonstration by testing shall take place within 1 hour of the expiration of the 12 hour period, and

(2) Continue to verify the operability of the redundant standby gas treatment system once per 7 days until the inoperable system is returned to operable status.

(3) Restore the inoperable standby gas treatment system to operable status within 30 days or cease all of the following: (a) fuel handling operations involving RECENTLY IRRADIATED FUEL. (b) operations with the potential to drain the reactor vessel. ~~spent fuel handling, core alterations or operation that could reduce the shutdown margin (excluding reactor coolant temperature changes.~~

7. If Specifications 3.5.B.5 and 3.5.B.6 are not met, reactor shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours and the condition of Specification 3.5.B.1 shall be met.

Bases:

Specifications are placed on the operating status of the containment systems to assure their availability to control the release of any radioactive materials from irradiated fuel in the event of an accident condition. The primary containment system[1] provides a barrier against uncontrolled release of fission products to the environs in the event of a break in the reactor coolant systems.

Whenever the reactor coolant water temperature is above 212°F, failure of the reactor coolant system would cause rapid expulsion of the coolant from the reactor with an associated pressure rise in the primary containment. Primary containment is required, therefore, to contain the thermal energy of the expelled coolant and fission products which could be released from any fuel failures resulting from the accident. If the reactor coolant is not above 212°F, there would be no pressure rise in the containment. In addition, the coolant cannot be expelled at a rate which could cause fuel failure to occur before the core spray system restores cooling to the core. Primary containment is not needed while performing low power physics tests since procedures and the Rod Worth Minimizer would limit rod worth such that a rod drop would not result in any fuel damage. In addition, in the unlikely event that an excursion did occur, the reactor building and standby gas treatment system, which shall be operational during this time, offer a sufficient barrier to keep off-site doses ~~well~~ below 10 CFR ~~100~~ 50.67 limits.

The absorption chamber water volume provides the heat sink for the reactor coolant system energy released following the loss-of-coolant accident. The core spray pumps and containment spray pumps are located in the corner rooms and due to their proximity to the torus, the ambient temperature in those rooms could rise during the design basis accident. Calculations[7] made, assuming an initial torus water temperature of 100°F and a minimum water volume of 82,000 ft.^{3}, indicate that the corner room ambient temperature would not exceed the core spray and containment spray pump motor operating temperature limits and, therefore, would not adversely affect the long-term core cooling capability. The maximum water volume limit allows for an operating range without significantly affecting accident analyses with respect to free air volume in the absorption chamber. For example, the containment capability[8] with a maximum water volume of 92,000 ft.^{3} is reduced by not more than 5.5% metal-water reaction below the capability with 82,000 ft.^{3}.

Experimental data indicate that excessive steam condensing loads can be avoided if the peak temperature of the suppression pool is maintained below 160°F during any period of relief valve operation with sonic conditions at the discharge exit. Specifications have been placed on the envelope of reactor operating conditions so that the reactor can be depressurized in a timely manner to avoid the regime of potentially high suppression chamber loadings.

Snubbers are designed to prevent unrestrained pipe motion under dynamic loads as might occur during an earthquake or severe transient, while allowing normal thermal motion during startup and shutdown. The consequence of an inoperable snubber is an increase in the probability of structural damage to piping as a result of a seismic or other event initiating dynamic loads. It is, therefore, required that all snubbers required to protect the primary coolant system or any other safety system or component be OPERABLE whenever the systems they protect are required to be OPERABLE.

The purpose of an engineering evaluation is to determine if the components protected by the snubber were adversely affected by the inoperability of the snubber. This ensures that the protected component remains capable of meeting the designed service. A documented visual inspection will usually be sufficient to determine system OPERABILITY.

Because snubber protection is required only during low probability events, a period of 72 hours is allowed for repairs or replacements.

Secondary containment[5] is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation when the drywell is sealed and in service and provides primary containment when the reactor is shutdown and the drywell is open, as during refueling. Because the secondary containment is an integral part of the overall containment system, it is required at all times that primary containment is required. Moreover, secondary containment is required during fuel handling operations and whenever work is being performed on the reactor or its connected systems in the reactor building ~~since their operation could result in inadvertent release of radioactive material.~~ involving RECENTLY IRRADIATED FUEL, which could result in the potential to drain the reactor vessel.

When secondary containment is not maintained, the additional restrictions on operation and maintenance give assurance that the probability of inadvertent releases of radioactive material will be minimized. Maintenance will not be performed on systems which connect to the reactor vessel lower than the top of the active fuel unless the system is isolated by at least one locked closed isolation valve.

IP

The trunnion room door is not an access opening for the passage of personnel and equipment into the reactor building. During all modes of operation, the trunnion room is a low traffic area and momentary openings of the door would be limited and administratively controlled and have little effect on SGTS and HVAC. Due to radioactive decay, during fuel handling operations these controls are only required when handling RECENTLY IRRADIATED FUEL; or during operations with the potential to drain the reactor vessel.

The standby gas treatment system[6] filters and exhausts the reactor building atmosphere to the stack during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. Due to radioactive decay, during fuel handling operations the standby gas treatment system is only required to be OPERABLE when handling RECENTLY IRRADIATED FUEL; or during operations with the potential to drain the reactor vessel.

In Section 3.5.B.5 and 3.5.B.6 of the Technical Specification, the use of the word "Circuits" actually means "Trains" as the word trains is used in the following paragraph.

Plant procedures direct that secondary containment integrity be maintained when handling heavy loads (greater than one fuel assembly), such as the reactor vessel head or dryer/separator, over the reactor cavity with fuel in the reactor vessel, to provide additional protection.

Two separate filter trains are provided, each having 100% capacity[6]. There is a section of ductwork upstream and downstream that is common to both filter trains. If one filter train becomes inoperable, there is no immediate threat to secondary containment and reactor operation may continue while repairs are being made. Since the test interval for this system is one month (Specification 4.5), the time out-of-service allowance of 7 days is based on considerations presented in the Bases in Specification 3.2 for a one-out-of-two system.

There is also only one vital power supply to the SGTS automatic initiation controls and for the operation of the heating coils for both filter trains.

Therefore, the SGTS is not mechanically nor electrically single failure proof. However, manual actuation of the SGTS is not vulnerable to single failures and is an acceptable backup to automatic initiation.

Two automatic secondary containment isolation valves are installed in each reactor building ventilation system supply and exhaust duct penetration. Both isolation valves for each supply duct penetration are located inside the secondary containment boundary, and the two exhaust duct penetration isolation valves are located outside of the secondary containment boundary. Removal of an inboard supply or exhaust valve (closest to the boundary) is permitted only when secondary containment is not required. The outboard isolation supply or exhaust valve can be removed when secondary containment is required as long as the inboard valve is secured in the closed position.

INSERT

References:

(1) FDSAR, Volume I, Section V-1
(2) FDSAR, Volume I, Section V-1.4.1
(3) FDSAR, Volume I, Section V-1.7
(4) Licensing Application, Amendment 11, Question III-25
(5) FDSAR, Volume I, Section V-2
(6) FDSAR, Volume I, Section V-2.4
(7) Licensing Application, Amendment 42
(8) Licensing Application, Amendment 32, Question 3
(9) Robbins, C. H., "Tests on a Full Scale 1/48 Segment of the Humboldt Bay Pressure Suppression Containment, "GEAP-3596, November 17, 1960.
(10) Bodega Bay Preliminary Hazards Summary Report, Appendix I, Docket 50-205, December 28, 1962.
(11) Report H. R. Erickson, Bergen-Paterson To K. R. Goller, NRC, October 7, 1974. Subject: Hydraulic Shock Sway Arrestors.
(12) General Electric NEDO-22155 "Generation and Mitigation of Combustible Gas Mixtures in Inerted BWR Mark I Containment" June 1982.
(13) Oyster Creek Nuclear Generating Station, Mark I Containment Long-Term Program, Plant Unique Analysis Report, Suppression Chamber and Vent System, MPR-733; August, 1982.

Due to radioactive decay, during fuel handling operations the secondary containment isolation valves are only required to be OPERABLE when handling RECENTLY IRRADIATED FUEL, or during operations with the potential to drain the reactor vessel.

INSERT TO TS PAGE 3.5-12

The addition of the term RECENTLY IRRADIATED FUEL associated with handling irradiated fuel in all secondary containment function Technical Specification requirements is applicable since analysis has demonstrated that after sufficient radioactive decay has occurred, off-site and control room operator doses resulting from a fuel handling accident remain below the limits of 10 CFR 50.67.

The following guidelines are included in the assessment of systems removed from service during movement of irradiated fuel:

- During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay.
- A single normal or contingency method to promptly close secondary containment penetrations should be developed for those times when secondary containment is not required. Such prompt methods need not completely block the penetration or be capable of resisting pressure. The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored.

(14) Oyster Creek Nuclear Generating Station, Mark I Containment Long-Term Program, Plant Unique Analysis Report, Torus Attached Piping, MPR-734; August, 1982.
(15) AmerGen Calculation C-1302-243-E170-087, "Wetwell-to-Drywell Vacuum Breaker Sizing."
(16) General Electric NEDE-24802, "Mark I Containment Program Mark I Wetwell-to-Drywell Vacuum Breaker Functional Requirements, Task 9.4.3," April, 1980.
(17) Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Traveler TSTF-51-A, Rev. 2.

3.17 Control Room Heating, Ventilating, and Air-Conditioning System

Applicability: Applies to the operability of the control room heating, ventilating, and air conditioning (HVAC) system and Control Room Envelope (CRE) boundary.

----------NOTE----------
The CRE boundary may be opened intermittently under administrative control.

Objective: To assure the capability of the control room HVAC system to minimize the amount of radioactivity from entering the control room in the event of an accident.

Specifications:

A. The control room HVAC system shall be operable during all modes of plant operation.

B. With one control room HVAC system determined inoperable for reasons other than specification D:

1. Verify once per 24 hours the partial recirculation mode of operation for the operable system, or place the operable system in the partial recirculation mode; and

2. Restore the inoperable system within 7 days, or prepare and submit a special report to the Commission in lieu of any other report required by Section 6.9, within the next 14 days, outlining the action taken, the cause of the inoperability and the plans/schedule for restoring the HVAC system to operable status.

C. With both control room HVAC systems determined inoperable for reasons other than specification D:

1. During Power Operation: place the reactor in the cold shutdown condition within 30 hours

2. During Refueling: RECENTLY IRRADIATED FUEL

(a) Cease ~~irradiated fuel~~ handling operations; and

(b) Cease all work on the reactor or its connected systems in the reactor building which could result in ~~inadvertent releases of radioactive materials~~ the potential to drain the reactor vessel.

D. When one or both control room HVAC systems are determined inoperable due to an inoperable CRE boundary:

1. During Power Operation: actions to implement mitigating actions shall be performed immediately, verification that the mitigating actions are in place shall be performed within 24 hours, and the CRE boundary shall be restored to operable status within 90 days.

2. During Refueling: RECENTLY IRRADIATED FUEL

(a) Immediately suspend movement of ~~irradiated fuel~~ assemblies in the containment; and

(b) Immediately initiate action to suspend operations with the potential to drain the reactor vessel.

During each refueling outage, four suppression chamber-drywell vacuum breakers will be inspected to assure components have not deteriorated. Since valve internals are designed for a 40-year lifetime, an inspection program which cycles through all valves in about 1/10th of the design lifetime is extremely conservative. The alarm systems for the vacuum breakers will be calibrated during each refueling outage. This frequency is based on experience and engineering judgement.

Initiating reactor building isolation and operation of the standby gas treatment system to maintain a 1/4 inch of water vacuum, tests the operation of the reactor building isolation valves, leakage tightness of the reactor building and performance of the standby gas treatment system. Checking the initiating sensors and associated trip channels demonstrates the capability for automatic actuation. Performing the reactor building in leakage test prior to refueling demonstrates secondary containment capability prior to ~~extensive~~ fuel handling operations involving RECENTLY IRRADIATED FUEL associated with the outage. Verifying the efficiency and operation of charcoal filters once per 18 months gives sufficient confidence of standby gas treatment system performance capability. A charcoal filter efficiency of 99% for halogen removal is adequate.

The in-place testing of charcoal filters is performed using halogenated hydrocarbon refrigerant which is injected into the system upstream of the charcoal filters. Measurement of the refrigerant concentration upstream and downstream of the charcoal filters is made using a gas chromatograph. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. Although this is basically a leak test, since the filters have charcoal of known efficiency and holding capacity for elemental iodine and/or methyl iodide, the test also gives an indication of the relative efficiency of the installed system. The test procedure is an adaptation of test procedures developed at the Savannah River Laboratory which were described in the Ninth AEC Cleaning Conference.*

High efficiency particulate filters are installed before and after the charcoal filters to minimize potential releases of particulates to the environment and to prevent clogging of the iodine filters. An efficiency of 99% is adequate to retain particulates that may be released to the reactor building following an accident. This will be demonstrated by testing with DOP at testing medium.

The 95% methyl iodide removal efficiency is based on the formula in GL 99-02 for allowable penetration [(100% - 90% credited in DBA analysis) divided by a safety factor of 2]. If the allowable penetration is ≤ 5%, the required removal efficiency is ≥ 95%. If laboratory tests for the adsorber material in one circuit of the Standby Gas Treatment System are unacceptable, all adsorber material in that circuit shall be replaced with adsorbent qualified according to Regulatory Guide 1.52. Any HEPA filters found defective shall be replaced with those qualified with Regulatory Position C.3.d of Regulatory Guide 1.52.

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* D.R. Muhabier. "In Place Nondestructive Leak Test for Iodine Adsorbers." Proceedings of the Ninth AEC Air Cleaning Conference. USAEC Report CONF-660904. 1966

ENCLOSURE 3

List of Commitments

SUMMARY OF AMERGEN COMMITMENTS

The following table identifies regulatory commitments made in this document by AmerGen. (Any other actions discussed in the submittal represent intended or planned actions by AmerGen. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	PROGRAMMATIC (Yes/No)
Oyster Creek will follow the guidelines in Section 11.3.6.5 of NUMARC 93-01, Rev. 3 during refueling within containment. Plant procedures will be revised, as appropriate, to implement these guidelines. The following guidelines are included in the assessment of systems removed from service during movement of irradiated fuel: • During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay. • A single normal or contingency method to promptly (within 1 hour) close secondary containment penetrations should be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure. The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored.	Upon implementation of approved amendment	No	Yes

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	PROGRAMMATIC (Yes/No)
The evaluated release points listed in Table 4-1 will be identified in the Oyster Creek Updated Final Safety Analysis Report (UFSAR) and in appropriate plant procedures governing secondary containment integrity and refueling activities. Evaluation of other locations will be administratively controlled in accordance with the requirements of 10 CFR 50.59. These controls will ensure that future evaluations of any additional openings in secondary containment will remain bounded by this analysis.	Upon implementation of approved amendment	No	Yes
Plant procedures will continue to require that secondary containment integrity be maintained when handling heavy loads (greater than one fuel assembly), such as the reactor vessel head or dryer/separator assembly, over the reactor cavity with fuel in the reactor vessel.	Upon implementation of approved amendment	No	Yes