WIND TUNNEL STUDY OF STEAM
TRANSPORT AND WIND FORCES FOR
A FLOATING NUCLEAR POWER PLANT

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ABSTRACT

Measurements were made in the Environmental Wind Tunnel of the concentration of steam released due to a steam line rupture or opening of steam relief valves as a result of loss of grid power on a 1:200 scale model of a floating nuclear power station complex including the breakwater. Data includes still photographs, slides. and TV motion sequences of tracer smoke released from the selected sources. Tables of non-dimensional concentrations at sampling points on the model have been prepared for over forty release scenarios.

Measurements were also made in the Meteorological Wind Tunnel of forces and moments produced in a 1:450 scale model of the floating power station surrounded by four different breakwater configurations. Pressure measurements made at surface taps over the surface of the plant structure have been integrated to produce three components of force and three moments about orthogonal axes.

ACKNOWLEDGMENTS

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LIST OF SYMBOLS Part I

Symbol	Definition	
A	Area of the projection of the power station	(L^2)
D	Stack diameter	(L)
E	Gas Chromatograph Response	(mvs)
Fr	Froude Number $\dfrac{V^2}{g\frac{\Delta\rho}{\rho}D}$	$(-)$
g	Gravitational constant	(L/T^2)
H	Stack height, or Power Station effective building height	(L)
K	Calibration constant for gas chromatograph	(ppm/mvs)
ΔH	Plume rise	(L)
k	von Karman constant	$(-)$
L	Reference length D_s/H_s	$(-)$
M	Molecular weight	$(-)$
q	Source flow rate	(L^3/T)
Q	Source strength	(M/T)
R	Exhaust velocity ratio V_s/V_a	$(-)$
Re	Reynolds number $\dfrac{VL}{\nu}$	$(-)$
U_*	Friction velocity	(L/T)
V	Mean velocity	(L/T)
x,y,z	General coordinates--downwind, lateral, upward	(L)
z_o	Surface roughness parameter	(L)

Greek Symbols

χ	Local concentration	(M/L^3)
τ	Sampling time	(T)
θ	Azimuth angle of upwind direction measured from plant north	
σ	Standard deviation of either plume dispersion or wind angle fluctuations	(L) $(-)$
ν	Kinematic viscosity	(L^2/T)

Symbol	Definition	
δ	Boundary-layer thickness	(L)
γ	Specific weight	$M/(T^2L^2)$
ρ	Density	(M/L^3)
Ω	Angular velocity	$(1/T)$
μ	Dynamic viscosity	$M/(TL)$

Subscripts

a	Atmospheric property at some reference height
ar	Air
i	initial
m	Model
max	Maximum
p	Prototype
ref	Reference quantity
s	Stack
st	Steam

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General Introduction

This report will be divided into two separate sections. The first
section will discuss the steam release phase of the study. The second
section will discuss the forces and moments on the structures.

The purpose of this study is: (1) to determine steam concentrations
at the diesel intake ducts following various steam released from the
FNP as a function of wind velocity and direction, (2) to determine the
resulting forces on the FNP as a function of wind velocity and direction,
(3) to make velocity profiles of the wind as it approaches the FNP as a
function of breakwater design, (4) to determine the resulting rotation
forces on both FNPs within the breakwater resulting from wind as a
function of breakwater design. The results of the steam release tests
will be evaluated to determine if the intake air will have adequate
oxygen to operate the diesel generators during various steam relief
and atmospheric wind conditions.

PART I: STEAM TRANSPORT

1.0 Introduction

In the event of loss of electrical grid or steam line rupture
the Offshore Nuclear Power System auxiliary diesel generators must
operate to maintain various reactor safety systems. A series of model
tests are described herein which were performed to ascertain whether
the intake air to the diesel generator systems will have adequate
oxygen to operate. Visualization as well as concentration measurements
were performed to evaluate the need for possible modifications to the
steam vent arrangement on the Floating Nuclear Plant to reduce the steam
concentrations at the diesel air intakes.

The general scope of Part I: Steam Transport includes determination
of how the steam plume behavior is affected by stack location, height, ejec-
tion velocity, wind direction, and wind speed. The atmospheric condition
simulated for this study is the adiabatic lapse rate (thermally neutral
flow). The prototype emission parameters and operating conditions examined
are summarized in Table 2. This section of the report is supplemented by
a television videotape which shows the plume behavior for the larger sources
for all operating levels and wind directions investigated during the course
of this study (see Appendix A for television videotape sequences). A set
of black and white photographs of each plume trajectory further supplements
the material presented in this report.

2.0 Simulation of Atmospheric Motion

The use of a wind tunnel for model tests of gas diffusion by the atmosphere is based upon the concept that nondimensional concentration coefficients will be the same at contiguous points in the model and the prototype and will not be a function of the length scale ratio. Concentration coefficients will only be independent of scale if the wind-tunnel boundary layer is made similar to the atmospheric boundary layer by satisfying certain similarity criteria. These criteria are obtained by inspectional analysis of physical statements for conservation of mass, momentum and energy. Detailed discussions have been given by Halitsky,[6] Martin,[9] and Cermak.[10] Basically the model laws may be divided into requirements for geometric, dynamic, thermic and kinematic similarity. In addition, similarity of upwind flow characteristics and ground boundary conditions must be achieved.

For the Offshore Power Plant study, geometric similarity is satisfied by an undistorted model of length ratio 1:200. This scale was chosen to facilitate ease of measurements, provide a boundary layer equivalent to 800-1000 feet for the atmosphere and minimize wind tunnel blockage. (The ratio of projected area to the area of the wind tunnel cross section should not exceed five percent. The model of the power plant at a scale of 1:200 produced a blockage of about three percent in the Environmental Wind Tunnel.)

2.1 Modeling the Neutral Atmosphere Case

When interest is focused on the vertical motion of plumes of heated gases emitted from stacks into a thermally <u>neutral</u> atmosphere the following variables are of primary significance:

ρ_a = density of ambient air

$\Delta\gamma$ = $(\rho_a - \rho_s)g$--difference in specific weight of ambient air and stack gas

Ω = local angular velocity component of earth

μ_a = dynamic viscosity of ambient air

V_a = speed of ambient wind at stack height

V_s = speed of stack gas emission

H = stack height

D = stack diameter

δ = thickness of planetary boundary layer

z_o = roughness heights for upwind surface

Grouping the independent variables into dimensionless parameters with ρ_a, V_a and H as reference variables yields the following parameters upon which the dependent quantities of interest must depend:[8,10]

$$\frac{V_a}{H\Omega} \ , \ \frac{\delta_a}{H} \ , \ \frac{z_o}{H} \ , \ \frac{D}{H} \ , \ \frac{V_a\rho_a H}{\mu_a} \ , \ \frac{\rho_s V_s^2}{\rho_a V_a^2} \ , \ \frac{\rho_a V_a^2}{\Delta\gamma D} \ , \ \frac{\Delta\gamma}{g\rho}$$

The laboratory boundary-layer-thickness parameter δ_a/H was made approximately equal to that for the atmosphere. A value for this ratio of at least 4.0 was established for the highest stacks. Equality of the effects of the surface parameter z_o/H for model and prototype was achieved through geometrical scaling of the stacks and similarity of the upwind velocity profile. Likewise the stack parameter D/H was equal for model and prototype.

Dynamic similarity is achieved in a strict sense if a Reynolds number $\frac{\rho_a V_a H}{\mu_a}$ and a Rossby number $\frac{V_a}{H\Omega}$ for the model is equal to its counterpart for the atmosphere. The model Rossby number cannot be made equal to the atmospheric value. However, over the short distances

considered (up to 2000 ft), the Coriolis acceleration has little influence upon the flow. Accordingly, the standard practice is to relax the requirement of equal Rossby numbers.[10]

Kinematic similarity requires the scaled equivalence of streamline movement of the air over prototype and model. It has been shown by Golden[5] that flow around geometrically similar sharp-edged buildings at ambient temperatures in a neutrally stratified atmosphere should be dynamically and kinematically similar when the approaching flow is kinematically similar. This approach depends upon producing flows in which the flow characteristics become independent of Reynolds number if a lower limit of the Reynolds number is exceeded. For example, the resistance coefficient for flow in a sufficiently rough pipe as shown in Schlichting[11](p. 521) is constant for a Reynolds number larger than 2×10^4. This implies that surface or drag forces are directly pro-portional to the mean flow speed squared. In turn, this condition is the necessary condition for mean turbulence statistics such as root-mean square value and correlation coefficient of the turbulence velocity components to be equal for the model and the prototype flow.[10]

Golden, as cited by Halitsky,[5,6] found that for flow about a cube for Reynolds numbers above 11,000, there was no change in concentration measurements. The minimum Reynolds number encountered in the present study was 14,000 based on the model scale of 1.0 ft and a minimum reference velocity of 2 fps. Correlation tests of flow about the Rock of Gibraltar, flow over Pt. Arguello, California, and flow over San Nicolas Island, California, may be cited as examples of large Reynolds number flows which have been modeled successfully in a wind tunnel.[12,13,14]

Buildings and building complexes produce nonuniform fields of flow which perturb the regular upstream atmospheric wind profiles. Around each building a boundary layer exists, where the velocity is zero at the surface but increases rapidly to a relatively constant value a short distance from the building wall. Outside of the boundary layer and downstream there exists a region of low velocities and pressures called the cavity. In this region circulations are such that flow may actually reverse with respect to the upstream winds. Surrounding the cavity but extending further downstream is a parabolic region called the wake in which the presence of the building is still evident in terms of deviations of velocity, turbulence, and pressure from conditions found in the upstream atmospheric boundary layer.

The formation of the wake and cavity regions are associated with a phenomena called boundary-layer separation. Under certain conditions the boundary layer actually detaches and enters the flow streaming about the building. This may occur at the corner of a sharp-edged building or on a curved surface if the pressure increases due to a decelerating flow field. The separated boundary layer forms a sheet which completely surrounds the cavity region which contains relatively stagnant fluid. The extent of the cavity region for the Floating Power Station building may be approximated by $5H \cong 1000$ ft. Based on the measurements of Evans[7] the effect of alternate wind approach angles to an elongated rectangular complex may extend this to $6H \cong 1200$ ft.

The need for scaling of the atmospheric mean wind profile was demonstrated by Jensen.[8] Substitutions of a uniform velocity profile for a logarithmic profile results in threefold variation in the dimensionless pressure coefficient downstream of a model building.

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Such variance in the pressure fields indicates a strong effect of the upstream wind profile on the kinematic behavior of the fluid near the building complex. As a result of such concern with the influence of wind profile and turbulence scale on micro-meteorological phenomenon special laboratory facilities have been constructed to simulate the atmospheric surface layer. Two of the few tunnels currently capable of generating turbulent boundary layers thick enough for 1:450 or 1:200 model scales are the Meteorological and Environmental Wind Tunnels at Colorado State University. The Meteorological Wind Tunnel depends on a very long test section to generate sufficiently thick boundary layers; whereas the Environmental Wind Tunnel utilizes a set of vortex generators at the test section entrance combined with surface roughness.

The length scale often used for scaling the velocity profile is the roughness height z_o.[10] For flow over sea surfaces the dynamic roughness z_o varies from 3.0×10^{-3} to 3.0×10^{-9} ft. (Poll, p. 139, 1965).[15] In a wind tunnel over a smooth surface the effective roughness length may be expected to behave as $0.141 \, \nu/U_*$. Thus, for a scale of 1:200 the modeled roughness scale will be greater than desired by an order of magnitude. In this study, however, the primary scales of turbulence will be generated by the approach velocity profile interacting with sharp cornered geometry of the breakwater and plant complex. For neutral flow conditions the mean wind velocity profile may be simulated by a power law profile whose exponent, n, has a value in the range from $0.12 - 0.15$,[16] i.e.,

$$\frac{V(z)}{V(z_{ref})} = \left(\frac{z}{z_{ref}}\right)^n.$$

where z_{ref} is some reference height, say $z_{ref} = H$.

Equality of the parameter $\rho_a V_a^2/(\Delta\gamma D)$ for model and prototype normally assures one that the plume trajectory in that region dominated by buoyancy will be similar. Often this criteria results in $(V_a)_m$ being too small to satisfy the minimum Reynolds number requirement. In such cases the specific weight difference for the model $(\Delta\gamma)_m$ can be made larger than $(\Delta\gamma)_p$ to compensate for the effect of small geometric scale. Unfortunately when one reduces the model plume density there is the problem that its momentum flux relative to that of the surrounding air is too low if the efflux velocity, V_s, is scaled by the same factors as the surrounding air velocity, V_a.

Since strict momentum and buoyancy modeling results in low Reynolds number flow fields the decision was made to emphasize the mean field flow behavior. Hence the model and prototype plumes were adjusted to have the same density ratios, $\Delta\rho/\rho$; but only the momentum and continuity characteristics of the plumes were modeled exactly. The plume Froude numbers differed by only small amounts. The initial plume behavior is governed by the interaction of the emitted effluent with the wind as determined by the ratio of their respective momenta.[9,10,11,15,] When the prototype and model plumes have the same density this reduces to a ratio of velocities $R = V_s/V_a$.

To summarize the following scaling criteria were applied for our neutral boundary layer situation

1) $\quad Re = \dfrac{\rho_a V_a H}{\mu_a} > 11,000$

2) $\quad (\dfrac{\Delta\gamma}{\rho})_m = (\dfrac{\Delta\gamma}{\rho})_p$

3) $\quad R = \dfrac{V_s}{V_a} \; ; \quad R_m = R_p$

4)   Similar velocity and turbulence profiles upwind.

Operating conditions for the Offshore Power Plant have been supplied by Offshore Power Systems (see Table 1). Modeled wind velocities, stack velocities, and plume densities based upon the selected scaling criteria are tabulated together in Table 2.

3.0 Test Apparatus

3.1 Wind Tunnels

The Environmental Wind Tunnel (EWT) (Fig. 1) was used for the steam release part of this study. The EWT incorporates a test section 12 ft wide and 57 ft long with a flexible ceiling which can be raised from 7 to 9 ft high to insure a zero longitudinal pressure gradient. A mean velocity of 1 to 60 ft/sec (0.68 to 41 mi/hr) can be obtained with a turbulence level of about 1 percent.

3.2 Model

The model (Fig. 2) used for this phase of the study consisted of two plants constructed of styrofoam surrounded by the breakwater according to "Design Test Specification SA-1000-14A86" and shown in Figs. 3 and 4. The models were constructed to a linear scale of 1:200. The basic flat ocean surface topography was reproduced by fixing the model directly to the smooth wind tunnel floor surface.

The model was located on the EWT floor at 44 ft from the entrance. The model was rotated to 8 wind angles as shown in Fig. 4. Location of sampling points and source release points are identified in Fig. 3.

Metered quantities of gas were allowed to flow from each stack to simulate the exit velocity and also account for the buoyancy effects due to the temperature difference between the stack gas and the ambient atmosphere. Helium and compressed air were mixed in metered amounts to

simulate the specific weight ratio, $\Delta\gamma/g\rho_a$, found in the full scale situation. Fischer-Porter Flowrator settings were adjusted for pressure, temperature, and molecular weight effects as necessary. When a visible plume was required the mixture was bubbled through titanium tetrachloride before emission. When a traceable plume was required a high pressure mixture of helium, propane and air was used.

3.3 Flow Visualization Techniques

Smoke was used to define plume behavior over the power plant complex. The smoke was produced by passing the air mixture through a container of titanium tetrachloride located outside the wind tunnel and transported through the tunnel wall by means of a tygon tube terminating at the stack inlet within the model complex. The plume was illuminated with arc-lamp beams. A visible record was obtained by means of pictures taken with a Speed Graphic camera utilizing Polaroid film for immediate examination. Additional still pictures were obtained with a Hasselblad camera. Stills were taken with camera speeds of ~1 second to identify mean plume boundaries. A complete series of color videotape television pictures were also taken. Complete sets of these still pictures and videotape sequences were provided to Offshore Power Systems as a separate part of this final report.

3.4 Gas Tracer Technique

After the flow in the tunnel was stabilized, a mixture of propane, helium, and air of predetermined concentration was released from model stacks at a required rate (Table 1). Samples of air were withdrawn from the sample points and analyzed. The flow rate of propane mixture was controlled by a pressure regulator at the supply cylinder outlet and monitored by Fischer and Porter precision flow meters. The source

concentration was as shown in Table 1. The sampling and detection systems are shown in Figs. 5 and 6.

3.5 Analysis of Data

Propane is an excellent tracer gas in wind tunnel dispersion studies. It is a gas that is readily obtainable and of which concentration measurements are easily obtained using gas chromatography techniques.

The procedure for analyzing the samples was as follows:

1) A sample volume drawn from the wind tunnel of 0.12 cubic inches was introduced into the Flame Ionization Detector.

2) The output from the electrometer, E, (in millivolt seconds) was integrated and then the readings were recorded for each sample.

3) These readings were transformed into concentration values by the following steps:

   χ(ppm) = K(ppm/mvs) x E. (mvs)

   where K was determined from a calibration gas of known concentration.

Average concentration values were determined for the known probe positions and are displayed in Table 5.

The values of the concentration parameter initially determined apply to the model and it is desirable to express these values in terms of the field. At the present time there is no set procedure for accomplishing this transformation. The simplest and most straightforward procedure is to make this transformation using the scaling factor of the model. Since

$$1 \text{ ft } \big|_m = 200 \text{ ft } \big|_p$$

one can write

$$\left.\frac{\chi V}{Q}\right|_p \ (\text{ft}^{-2}) = \frac{1}{200^2} \times \left.\frac{\chi V}{Q}\right|_m \ (\text{ft}^{-2}) \ .$$

The sample scaling of the concentration parameter from model to field appears to give reasonable results. All data reported herein are in terms of their equivalent prototype value $\left.\frac{\chi V}{Q}\right|_p$.

3.6 Errors in Concentration Measurement

Each sample as it passes through the flame-ionization detector is separated from its neighbors by a period during which nitrogen flows. During this time the detector is at its base line, or zero level. When the sample passes through the detector the output rises to a value equal to the base line plus a level proportional to the amount of tracer gas flowing through the detector. The base line signal is set to zero and monitored for drift. Since the chromatograph used features a temperature control on the flame and electrometer there is very low drift. The integrator circuit is designed for linear response over the range considered. A total system error can be evaluated by considering the standard deviation found for a set of measurements where a precalibrated gas mixture is monitored. For a gas of ~ 100 ppm propane ± 1 ppm the average standard deviation from the electrometer was 2 percent.

Since the source gas was premixed to the appropriate molecular weight and repetitive measurements were made of its source strength (~ 44,000 ppm) the confidence in source strength concentration is similar. The flow rate of the source gas was monitored by Fischer-Price

Flowmeters which are expected to be accurate to ± 2 percent including

calibration and scale fraction error. The wind tunnel velocity was

constant to ± 10 percent at such low settings. Hence the cumulative

confidence in the measured values of $_\chi V/Q$ will be a standard

deviation of about ± 11 percent, whereas the worst cumulative scenario

suggests an error of no more than ± 20 percent.

The lower limit of measurement is imposed by the instrument

sensitivity and the background concentrations of hydrocarbons in the

air within the wind tunnel. Background concentrations were measured and

subtracted from all measurements quoted herein; however, a lower limit

of 1 to 2 ppm of propane is available as a result of background methane

levels plus previous propane releases. An upper limit for propane with

the instrument used is 10 percent propane by volume; however, chromatograph

columns are necessary to avoid overwhelming the detector at flowrates

above 5 - 6 percent. A recent report on the flame ionization detector

for sampling gases in atmospheric wind tunnels prepared by Dear and

Robins arrives at similar figures.[17]

4.0 Test Program and Results

4.1 Test Program

The test program consisted of (1) a qualitative study of the flow

field around the power plant by visual observation of the smoke plume

trajectory released from the stacks; and (2) a quantitative study of

gas concentrations produced by the release of propane from the stacks.

The test conditions are summarized in Tables 2 and 3.

Angular locations of the approach winds are referred to in terms

of angles from a nominal north which is shown in Fig. 4. Vertical

traverse coordinates are measured from the nominal site center shown

in the same figure. Unless otherwise noted, the term wind velocity refers to the velocity upstream at a reference height of 250 ft (a mean total height for the plant structure). However, a velocity at any reference height is available by referring to the velocity profiles (Fig. 7).

4.2 Test Results: Characteristics of the Flow

All the experiments were carried out in the EWT over the range of conditions shown in Table 2. The atmospheric boundary layer was modeled to produce a velocity profile equivalent to flow over the open ocean. Figure 7 shows the development of the velocity profile over the model. The profile is conditioned by the building complex as the wind passes over the plant. No comparison of model velocity data with that in the prototype is possible because the latter is not available over a range of height. However, as the model velocity profiles reproduce a power-law behavior with exponents of 0.13 for prototype reference velocities of 5, 35, or 190 ft/sec it is expected that the prototype flow effects over the plant complex are adequately represented by the model.

4.3 Test Results: Flow Visualization

Visualization tests consist of photographs, slides, and TV sequences showing the general nature of air flow and diffusion in the vicinity of the power station. A general understanding of wake and cavity flows is helpful for an interpretation of the plume behavior (Refs. 6 and 7). Complete sets of still photographs supplement this report. Color slides and color TV motion pictures have been arranged into titled sequences, and the sets available are summarized in Appendix A. Turbulent dispersion of gaseous effluent released for three steam release scenarios (loss of

grid, steam line rupture, and steam line rupture (circle design)), three wind velocities (5, 35, 190 ft/sec), eight wind directions, five release heights, and a variety of discharge conditions were studied. After an initial survey of the possible effects of different combinations of these variables specific combinations were selected for permanent record in consultation with an OPS representative. Forty cases were documented on visual devices (see Appendix A) and forty-three situations were chosen for concentration measurements.

Loss of Grid Tests

Flow visualization indicated that steam effluent released from steam relief valves located at 253 ft up along the side of the containment vessel did not become entrained into the building wake for any orientation for the velocity range studied. Thus steam released at 1500 ft/sec lofted above the initial wake region for wind velocities between 5 to 140 ft/sec. Effluent released at 750 or 375 ft/sec were also able to avoid interaction with a wind produced wake at 35 ft/sec.

Steam Line Rupture Tests

A complete rotation of the model relative to the approach wind indicated the maximum probability of steam entrainment and transport to diesel engine ventilators exists for orientations of 225, 270, and 315 degrees; therefore the various penthouse modifications studied were recorded for only these angles.

As expected, release of steam from a ventilator located at the base of the containment vessel (190 ft) permitted entrainment of the gases into the wake and partial recirculation back against the diesel ventilator face of the structure. Figure 9 depicts the plume behavior for various wind approach angles for a wind velocity of 35 ft/sec. Raising the

penthouse A-1 successively to 253, 281, and 310 ft permits further

lofting of the steam with a decrease in plume density in the cavity

region (see Fig. 10). A variation of wind velocity for a penthouse

height of 253 ft (Fig. 11) suggests that plume entrainment is not a

problem at 5 ft/sec, is possible at 35 ft/sec, and is entrained but

adequately diluted at 190 ft/sec.

Plumes released from Section A-2, on the upwind side of the

containment vessel tend to loft over the main structure. Figure 12

suggests that there will be plume entrainment into the cavity for a

253 ft penthouse; however, the major portion of the gas moves downwind

undisturbed. For a 281 ft penthouse plumes emitted from Section A-2

do not downwash significantly.

Several visual tests were performed where penthouse exit area was

decreased for the same discharge or discharge was decreased for the

original specified exit area (2370 sq. ft). Although some improvement

of plume loft was evident in the first case the geometry of power plant

and penthouse seemed to dominate and such changes should be considered

only if structurally and economically convenient. As one decreases

discharge the loft of the plume decreases; however, the visual impression

is that little change occurs in cavity contamination. Hence increased

entrainment is balanced by decreased source strength.

Steam Line Rupture (Circle Design)

A single visual observation was made of the impact of a ruptured

steam line located at 233 ft spraying steam from a five sq. ft

area directly upstream (090°) at 1500 ft/sec. Although the plume

penetration is impressive (~ 500 ft upwind) the buoyant gas appears

to be spread over a wide enough of an area that tracer density along

the diesel inlet face of the power station remained low. It is probable that concentrations will be larger than for an equivalent rupture through the 253 ft penthouse--but not very much larger (see Fig. 13).

4.4 Test Results: Concentration Measurements

From the total set of cases examined by flow visualization techniques a set of critical cases were selected by CSU and OPS observers for concentration sample studies. The range of scenarios chosen are summarized in Table 3. Concentration measurements were performed as outlined in Section 3.4 and analyzed per the description found in Section 3.5. All measurements are tabulated in Table 5 in terms of the universal function $\chi V/Q$ (ft^{-2}). In addition prototype steam concentrations for the conditions stipulated in Table 1 are tabulated in terms of χ(lbm steam/ft^3)* in Table 6. Conversion to volumetric fraction is explained in Appendix B by means of a simple multiplicative constant.

Loss of Grid Tests

Confirming the expectations obtained from the flow visualizations, concentrations at the diesel ventilator inlets were greatest for the hurricane force winds. For lower wind situations, all angles, and release conditions concentrations were marginally above background levels.

Steam Line Rupture

Considering an average concentration level over sample ports 1-11 on Building A the influence of raising the A-1 penthouse from 190 to 253, to 281, and to 310 ft was to decrease $\chi V/Q \times 10^8$ (ft^{-2}) from ~ 450, to ~ 67, to ~ 19, and to ~ 7.4 for an approach wind speed of

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*Prototype data may be expressed in terms of partial pressure or parts per million of air; however, one must perform an energy balance based on an adiabatic mixing assumption in order to calculate mixture temperatures.

35 ft/sec from 225 degrees. Similar results occur for 270 degree and 315 degree approach angles. The values of $(\chi VL^2/Q)$ suggested by Halitsky[5,6] for dilution due to containment cavity pollution released at low velocities into the wake are ~ 1.0 to 5.0. Thus one would expect values on the back face of the OPS structure to be of the order $\chi V/Q \times 10^8$ (ft^{-2}) = 2500 to 12,500 or less. Maximum concentrations found herein are of the order of 2000 for a release at 190 ft, 225 degrees, at 35 ft/sec.

The fact that samples measured lie at the lower end of Halitsky's range is not unexpected. Steam discharge tended to adhere to the containment vessel side until nearly 250 ft elevations even when released at 190 ft. The plume itself is quite buoyant, once aloft it resists downwash to the sea surface. Finally Halitsky's results were prepared for cases $V_s/V_a \approx 0$; whereas here $V_s/V_a \approx 1.0$.

Measurements made in an earlier study for steam relief valves only (Ref. 1--Cases B-142, 143, 144) produced concentrations in the range $\chi V/Q \times 10^8$ (ft^{-2}) equal to 260 to 2600 for a 1/450 scale model. These measurements are of the same magnitude as those found herein despite the fact that exhaust ports were so small as to ensure laminar jet release conditions.

At most locations for releases from a 253 ft penthouse the concentration sample resulted in the same order value for the 190 ft/sec and 35 ft/sec wind speeds. For a 5 ft/sec wind speed the steam plume rose nearly vertical with sample ports reading close to background values.

Steam Line Rupture (Circle Design)

Maximum concentrations measured during this configuration were of
the same level as releases from a 253 ft penthouse. Low level of
concentrations may be attributed to plume rise and dilution of the
plume as it mixes with the oncoming wind.

5.0 Conclusions

This investigation was undertaken to determine the dispersion of
steam released from relief valves or ventilators as it might influence
auxiliary diesel engine start up performance. The primary aim of this
portion of the study was to determine gas dilution magnitudes at
ventilator inlets, and to provide data for selecting alternative release
configurations.

On the basis of the experimental measurements reported herein,
the following comments may be made:

1. Release of steam from relief valves which rise to the edge
    of the containment vessel (253 ft) should not produce
    significant steam concentrations at diesel inlet ventilators
    for wind speeds ranging up to 190 ft/sec for the specified
    discharge rates (1500 ft/sec).

2. Discharge from a low penthouse ventilator (190 ft) will
    produce concentrations of the same order as those resulting
    from mixing the discharged steam across the wake cross
    section downstream of the power station.

3. These levels may be reduced by one to two order of magnitudes
    by increasing the ventilator height up to the upper edge of
    the containment vessel outer wall (253 ft). This level
    also appears to protect power plant personnel from direct
    emission in the high temperature steam exhaust.

4. Decrease of steam inlet concentrations by a further order of magnitude is possible by raising the ventilator above the height of the rest of the plant structure (310 ft).

5. Rupture of a pipe line in the circle design configuration may result in concentrations of the same order as a steam line rupture at 253 to 281 ft penthouse locations.

TABLE 1: PROTOTYPE EMISSION PARAMETERS OF AN OFFSHORE NUCLEAR POWER PLANT[Δ]

Source	Steam Flow* per discharge section (lbm/sec)	(ft/sec)	Elevation of steam discharge Side 1 (ft)	Side 2 (ft)	Discharge Area/Section (ft²)	Wind Velocity @ 253' (ft/sec)	$R = \dfrac{\rho_s\,V_s^2}{\rho_a\,V_a^2}$	$F_r = \dfrac{V_a^2}{gL\,\frac{\Delta\rho}{\rho_a}}$
Loss of Grid Tests	900	1500	253	253	17.67	35, 190	777.1, 26.4	1.32, 38.66
	450	750	253	253	17.67	35	194.3	1.32
	225	375	253	253	17.67	5, 35	2379.8, 48.6	0.03, 1.32
	1575	2625	253	253	17.67	35	2379.8	1.32
Steam Line Rupture	2576	32	⌈190, 253, 281, 310	⌈253, 281, 310	2370	5, 35, 190	17.3, .35, .012	.03, 1.32, 38.66
		64			1185	35	1.41	1.32
		128	⌊310		592	35	5.66	1.32
	1288	16	for each case	for each case	2370	35	.088	1.32
	644	8			2370	35	.022	1.32
Steam Line Rupture (circle design)	255	1500	232	--	5	35	777.1	1.32

[Δ]Conditions provided by OPS (7-14-75)

*T_{steam} = 300°F, $\left(\rho_a - \rho_s\right)/\rho_a$ = 0.58;   NOTE: Froude number effect insignificant in near vicinity for $F_r > 0.8$

P steam = 14.7 psia

T_{air} = 60°F, L ≈ 50 ft

$$\text{TABLE 2:} \quad \text{MODEL EMISSION PARAMETERS}^{\Delta,*}$$

Source	Tracer Gas** Discharge/Section (ft/sec)	Elevation at steam discharge	Discharge Area Section (ft²)	Wind Velocity @ 253' equiv (ft/sec)	$R = \dfrac{\rho_s V_s^2}{\rho_a V_a^2}$	$F_r = \dfrac{V_a^2}{gL\frac{\Delta\rho}{\rho}}$
Loss of Grid Tests	128.6, 23.7		.00044	3, 3	777.1, 26.4	1.92, 1.92
	64.3		.00044	3	194.3	1.92
	32.1		.00044	3	48.6	1.92
	75.0		.00044	~1	2379.8	0.21
Steam Line Rupture	6.4, 2.74, 0.51	Same as prototype specification only at modeled position.	.059	1, 3, 3	17.3, .35, .012	0.21, 1.92, 1.92
	5.48		.029	3	1.41	1.92
	10.96		.015	3	5.66	1.92
	1.37		.059	3	.088	1.92
	.68		.059	3	.022	1.92
Steam Line Rupture (Circle design)	128.6		.000125	3	777.1	1.92

$^{\Delta}$Model scale for diffusion experiments 1:200

*Steam density ratio modeled exactly by mixing He, Air, and Propane, thus $(\frac{\Delta\rho}{\rho_a})_m = (\frac{\Delta\rho}{\rho_a})_p = 0.58$ which required (Molecular Weight)$_m$ = 12.18, $T_s = T_a = 60°F$, p = 12 psia.

**Contained ~ 44,000 ppm Propane during concentration measurements

TABLE 3: SUMMARY OF TEST CONDITIONS
FOR CONCENTRATION MEASUREMENTS

Test No.	Plant Scheme	Wind Direction (°)	Wind Speed (ft/sec)	Discharge Velocity (ft/sec)	Penthouse Elevation (ft)	Stack Area (ft²)	Average Concentration Ports 1-11 ($\frac{\chi V}{Q} \times 10^8$) (ft⁻²)	Maximum Concentration Ports 1-11 ($\frac{\chi V}{Q} \times 10^8$) (ft⁻²)
Steam Line Rupture Tests:								
1	A-1	225	35	32	190	2370	450	2100
2	"	270	"	"	"	"	162	540
3	"	315	"	"	"	"	230	649
4	"	225	"	"	253	"	55	191
5	"	270	"	"	"	"	42	242
6	"	315	"	"	"	"	67	356
7	"	270	"	64	"	1185	17	72
8	"	270	"	128	"	592	50	222
9	"	270	"	16	"	2370	36	183
10	"	270	"	8	"	"	81	309
11	"	225	190	32	"	"	160	979
12	"	270	"	"	"	"	80	287
13	A-2	225	35	"	"	"	99	398
14	"	270	"	"	"	"	41	244
15	"	315	"	"	"	"	51	276
16	A-1	225	"	"	281	"	19	65
17	"	270	"	"	"	"	19	48
18	A-2	225	"	"	"	"	10	42
19	"	270	"	"	"	"	9	28
20	A-1	225	"	"	310	"	7	38
21	"	270	"	"	"	"	7	55
22	A-2	225	"	"	"	"	16	71
23	"	270	"	"	"	"	3	10
24	A-1	270	"	64	"	1185	14	99
25	"	270	"	128	"	592	5	15
26	"	270	"	16	"	2370	27	79
27	"	270	"	8	"	"	51	210
28	"	270	190	32	"	"	66	108
29	"	225	5	"	253	"	6	42
30	"	270	"	"	"	"	4	30
31	"	000	35	"	"	"	18	132
32	"	045	"	"	"	"	33	836
Loss of Grid Tests:								
33	A-1&2	315	35	1500	253	17.67	2	5
34	"	270	"	"	"	"	2	4
35	"	225	"	"	"	"	2	4
36	"	315	190	"	"	"	12	47
37	"	270	"	"	"	"	11	24
38	"	225	"	"	"	"	6	10
39	"	270	35	750	"	"	5	12
40	"	270	"	375	"	"	0	4
41	"	270	"	2625	"	"	0	2
42	"	270	5	375	"	"	14	39
Steam Line Rupture (Circle Design):								
43	A	090	35	1500	232	5	10	29

TABLE 4:   INSTRUMENTATION AND MATERIALS
EMPLOYED

Camera

Still: Speedgraphic Camera 4" x 5",
Hasselblad 2" x 3"

Film

Still: Tri-X-Pan 4164 Kodak, Polaroid

Exposure

Still: f = 8-11, t = 1/30 - 1 sec

Television System

Single Tube Color TV Camera Sheboden Model FP-1500 V(E,K)

Color Video Cassette Recorder, JVC Model CR-6000V

Concentration System

Hewlett-Packard Model 5711-A Gas
    Chromatograph; dual flame
    ionization detector; electrometer
    isothermal oven controller; 1/2cc dual
    sampling loops.
Sampling Panels: CSU design; 16 sample
    volumes; transfer equipment; and
    flowrators.
Hewlett-Packard Integrating Digital
    Voltmeter Model 2401C

Velocity Control System

Trans-Sonics Type 120B Equibar
    Pressure Meter-Serial 44801
United Sensor Pitot-Static Probe

TABLE 5: CONCENTRATIONS MEASURED AT
PORTS ($[\chi V/Q \times 10^8]$) (ft^{-2})

Test No.

Sample Port No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	359.6	5.5	0	0	2.2	41	0	0	0	0	24	0	398	5.5	0
2	112	0	209	1.1	0	32.2	0	2.2	2.2	0	0	0	70	2.2	2.2
3	1,306	253	649	79	-	81	34	75	66	233	316	257	62	102	30
4	883	448	495	109	110	154	72	202	52.8	67	36	78	34	24.4	15.5
5	81	343	280	113	2.2	47.7	7.8	8.8	11	54	48	59.7	52	7.7	25.5
6	18	13.3	1.8	5.5	22.2	0	1.1	0	8.8	31	90	59.7	0	0	2.2
7	16.7	11.1	40	14	0	1.1	0	1.1	2.2	13	24	18	27.8	-	28.9
8	0	7.8	69	61	3.3	0	0	3.3	11.0	18	30	30	4.4	4.4	276
9	2,099	540	634	191	242	356	55.5	222	182.6	309	979	287	55.5	244	75.5
10	0	21	98	32	3.3	1.1	2.2	11.1	28.6	81	101	59.7	1.1	15.5	82
11	41	143	57	7.8	12.2	26.6	16.7	22	30.8	90	113	36	384	17.8	23
12	12,626	3,040	6,107	3,679	3,042	6,527	620	2,083	15,620	2,719	20,345	22,561	51	3,112	220
13	8,755	7,224	5,885	7,062	7,459	1,350	3,885	1,861	17,334	18,722	23,707	25,671	42	2,532	304
14	2,733	7,478	3,931	6,520	12,446	397	754	5,817	4,875	4,556	9,833	9,367	11	1,190	409

Test No.

Sample Port No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	5.5	0	42	0	3.3	5.5	71	0	3.5	0	21	24	63.5	3.7	1.2
2	5.5	4.4	20	1.2	5.5	0	14	1	2.4	5.9	23.3	24	38	3.6	1
3	5.5	3.3	14	-	4.4	0	9	4	9	2.4	21	28.6	51	3.6	2.9
4	5.5	6.6	12	6	3.3	1	8	5	9.4	0	21	47.7	89	2.2	2.5
5	2.2	1	6	4.8	1	0	5	3	6	3.5	14	33.4	63.5	1.7	1.4
6	21	18	4.8	4.8	3.3	0	0	2	2.4	0	16.3	33.4	38	1.4	1.2
7	0	0	3.6	2.4	0	0	2	1	3.5	2.4	14	28.6	44.5	1.5	1
8	1	1	3.6	8.4	0	1	0	4	4.7	2.4	16.3	28.6	44.5	1.2	1
9	42	47.7	14.4	24	38	12	44	10	11.8	6	37.3	62	108	6.6	3.2
10	65	7.8	6	12	0	2.2	1	3	8.3	12	35	38	89	1.7	1.4
11	54	20	26.4	27.5	23	55	19.4	5	99	15.3	79.4	210	95.3	42	30
12	3,148	674	9.6	396	666	38	50	108	99	28.3	121	143	178	54	51
13	7,126	9,275	12	3,820	100	2,074	1	2,037	10,140	374	5,835	1,058	1,614	492	489
14	9,805	12,550	9.6	7,540	14.2	370	0	6,723	1,886	16.5	5,601	1,201	762	1,443	1,112

TABLE 5 (Con't)

Sample Port No.	31	32	33	34	35	36	37	Test No. 38	39	40	41	42	43
1	7.3	0	0	1.7	3.5	0	9.5	4.7	1.7	0	0.5	0	20.9
2	7.3	0	0	0	2.6	0	9.5	9.5	1.7	0	0	4.9	13.0
3	6.1	1.2	0	2.6	2.6	0	9.5	4.7	8.7	0	0	29.5	28.7
4	2.4	1.2	0.87	1.7	2.6	4.7	18.9	9.5	10.4	0	0	44	16.5
5	7.3	1.2	1.7	2.6	1.7	47.3	9.5	9.5	3.5	0	0	4.9	0
6	0	13.3	0.87	0.87	0	0	9.5	4.7	0	0	0	4.9	0
7	2.4	1.2	1.7	1.7	0	0	9.5	4.7	1.7	0	0	4.9	0
8	14.5	1.2	0.87	2.6	0	9.5	4.7	9.5	3.5	0	1.0	4.9	0
9	12.1	836	5.2	3.5	3.5	33	9.5	0	12.2	0	0	39.4	25.2
10	10.9	50	4.4	1.7	0.87	28.4	9.5	0	1.7	0	0.5	9.8	2.6
11	132	206	2.6	2.6	2.6	4.7	23.7	4.7	5.2	3.5	1.6	9.8	7.8
12	32.7	1,550	4.4	6.1	1.7	37.8	161	9.5	12.2	3.5	2.1	54	39
13	43.6	13,322	5.2	2.6	0.87	132	1,987	14.2	3.5	3.5	0	24.6	3.5
14	258	18,722	10.4	13.1	0.87	960	4,408	520	22.6	0	1.0	19.7	0.87
15	10.9	35.1	2.6	1.7	0	4.7	28.4	9.5	1.7	3.5	0.5	9.8	-
16	12.1	25.4	2.6	1.7	0	4.7	14.2	4.7	1.7	0	0	4.9	
17	10.9	7.3	1.7	1.7	0.87	4.7	4.7	14.2	3.5	0	1.0	4.9	
18	8.5	60.6	0.87	1.7	0.87	0	0	4.7	1.7	0	0.5	4.9	
19	2.4	123.5	5.2	2.6	1.7	14.2	56.8	9.5	5.2	3.5	3.6	9.8	
20	13.3	101.7	2.6	2.6	0.87	4.7	9.5	9.5	5.2	3.5	3.1	9.8	
21	2.4	496.6	5.2	1.7	0.87	4.7	104	4.7	5.2	0	1.0	4.9	
22	0	302	6.1	1.7	0.87	4.7	75.7	9.5	3.5	0	1.0	4.9	
23	1.2	8.5	1.7	1.7	1.7	9.5	4.7	4.7	3.5	3.5	1.6	4.9	
24	7.3	6.1	2.6	1.7	1.7	4.7	0	4.7	3.5	3.5	2.1	4.9	
25	3.6	4.8	1.7	1.7	0.87	4.7	14.2	4.7	1.7	3.5	1.0	4.9	

Nos. 1-11 are Sample Positions of Plant A
Nos. 15-25 are Sample Positions of Plant B (relative to positions 1-11 of Plant A)
Nos. 12, 13, 14 are Adjacent to Position No. 9
at Elevations 281', 310', 340' Respectively

TABLE 6: STEAM CONCENTRATIONS MEASURED AT SAMPLE PORTS ($[\chi] \times 10^6$) (lbm steam/ft^3)

	Test No.														
Sample Port No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	265	4.1	0	0	1.6	30.2	0	0	0	0	3.3	0	293	4.1	0
2	82	0	154	0.82	0	23.7	0	1.6	0.8	0	0	0	51	1.6	1.6
3	962	186	473	58	-	59.6	25	55.5	24.3	42.8	42.9	34.8	45.7	75	22
4	650	330	364	80	80.9	113.6	53	149	19.5	12.3	4.8	10.5	25	18	11.4
5	60	252	206	83	1.6	35.1	5.7	6.5	4.1	10.0	6.5	8.1	38	5.7	18.8
6	13	9.8	1.3	41	16.3	0	.817	0	3.3	5.7	12.2	8.1	0	0	1.6
7	12	8.2	29	10.6	0	.817	0	.817	0.8	2.3	3.3	2.4	20.4	-	21.2
8	0	5.7	51	45	2.5	0	0	2.5	4.1	3.3	4.1	4.1	3.3	3.3	203
9	1,545	398	466	140.5	178	262	40.8	163	67.2	56.8	133	38.9	40.8	179	55.5
10	0	15.5	72	23.7	2.5	.810	1.6	8.17	10.5	14.9	13.8	8.1	.817	11.4	60
11	30	105	42	5.7	9.0	19.6	12.3	16	11.8	16.5	15.3	4.8	283	13.1	17
12	9,293	2,238	4,495	2,707	2,239	4,804	457	1,533	5,748	500	2,758	3,059	37.6	2,291	162
13	6,443	5,317	4,332	5,198	5,490	993	2,859	1,370	6,379	3,445	3,221	3,480	31	1,864	223
14	2,011	5,504	2,823	4,799	9,160	292	555	4,281	1,799	838.3	1,333	1,270	8.1	876	301

	Test No.														
Sample Port No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	4.1	0	31	0	2.4	4.0	52.5	0	2.6	0	7.8	4.4	8.6	19.2	6.1
2	4.1	3.3	15	.88	4.0	0	10.5	.7	1.7	4.3	8.6	4.4	5.2	18.4	5.2
3	4.1	2.4	10	-	3.2	0	6.7	3.0	6.1	1.7	7.8	5.3	7	18.4	15
4	4.1	4.9	9	4.4	2.4	.73	6	3.7	6.9	0	7.8	8.9	12	11.4	13
5	1.6	.74	4	3.5	.73	0	3.7	2.2	4.3	2.6	5.2	6.1	8.6	8.7	7
6	15.5	13.1	3.5	3.5	2.4	0	0	1.5	1.7	0	6.0	6.1	5.2	7	6
7	0	0	2.6	1.8	0	0	1.5	.7	2.6	1.7	5.2	5.1	6	8	5.2
8	.74	.74	2.6	6.2	0	.73	0	3	3.5	1.7	6.0	5.1	6	6	5.2
9	31	35.1	10.6	17.7	28	8.8	32.2	7.5	8.7	4.3	13.7	11.4	14.6	34	16.6
10	48	5.7	4.4	8.8	0	1.6	.7	2.2	6.1	8.7	12.9	7.0	12	8.7	7
11	40	14.7	19.4	20	16.8	41	14.2	3.7	72.9	11.3	29.2	38.5	13	216	155
12	2,317	496	7.1	291	490	28	36.7	79.5	72.9	20.8	44.5	26.3	24	279	262
13	5,245	6,227	8.8	2,810	74	1,524	.7	1,500	7,463	275	2,147	194.5	219	2,536	2,519
14	7,216	9,237	7.1	5,550	10.4	273	0	4,948	1,388	12.1	2,061	221	103	7,434	5,729

TABLE 6 (con't)

	31	32	33	34	35	36	37	38	39	40	41	42	43
1	5.3	0	0	.44	0.9	0	.44	.22	.22	0	.68	0	1.5
2	5.3	0	0	0	.67	0	.44	.44	.22	0	0	2.2	.95
3	4.5	.9	0	.67	.67	0	.44	.22	1.12	0	0	13.3	2.1
4	1.8	.9	.22	.44	.67	.22	.90	.44	1.34	0	0	19.8	1.2
5	5.3	.9	.44	.67	.44	2.2	.44	.44	.44	0	0	2.2	0
6	0	9.8	.22	.22	0	0	.44	.22	0	0	0	2.2	0
7	1.8	.9	.44	.44	0	0	.44	.22	.22	0	0	2.2	0
8	10.7	.9	.22	.67	0	.45	.22	.44	.44	0	.45	2.2	0
9	8.9	615	1.34	0.9	0.9	1.56	.44	0	1.57	0	0	17.7	1.8
10	8	36.5	1.13	.44	.22	1.35	.44	0	.22	0	.23	4.4	.19
11	97.2	151	.67	.67	.67	.22	1.12	.22	.67	.23	.72	4.4	.57
12	24.1	1,141	1.13	1.57	.44	1.79	7.62	.44	1.57	.23	.95	24.3	2.8
13	32.1	9,805	1.34	.67	.22	6.25	94.1	.67	.44	.23	.45	11.1	.26
14	190	13,816	2.67	3.37	.22	45.5	209	24.6	2.91	.23	0	8.9	.06
15	8	26	.67	.44	0	.22	1.35	.44	.22	.23	.23	4.4	-
16	9	18.7	.67	.44	0	.22	.67	.22	.22	.23	0	2.2	-
17	8	5.3	.44	.44	.22	.22	.22	.67	.44	.23	.45	2.2	-
18	6.2	44.6	.22	.44	.22	0	0	.22	.22	.23	.23	2.2	-
19	1.8	91	1.34	.67	.44	.70	2.7	.44	.67	.23	1.6	4.4	-
20	9.8	75	.67	.67	.22	.22	.44	.44	.67	.23	1.4	4.4	-
21	1.8	365	1.34	.44	.22	.22	4.93	.22	.67	.23	.45	2.2	-
22	0	222	1.57	.44	.22	.22	3.6	.44	.44	.23	.45	2.2	-
23	.9	6.2	.44	.44	.44	.44	.22	.22	.44	.23	.72	2.2	-
24	5.3	4.5	.67	.44	.44	.22	0	.22	.44	.23	.95	2.2	-
25	2.7	3.6	.44	.44	.22	.22	.67	.22	.22	.23	.45	2.2	-

Sample Port No. — Test No.

Nos. 1-11 are Sample Positions on Plant A
Nos. 15-25 are Sample Positions on Plant B (relative to position 1-11 of Plant A)
Nos. 12, 13, 14 are Adjacent to Position No. 9 at Elevations 281', 310', 340' Respectively

27
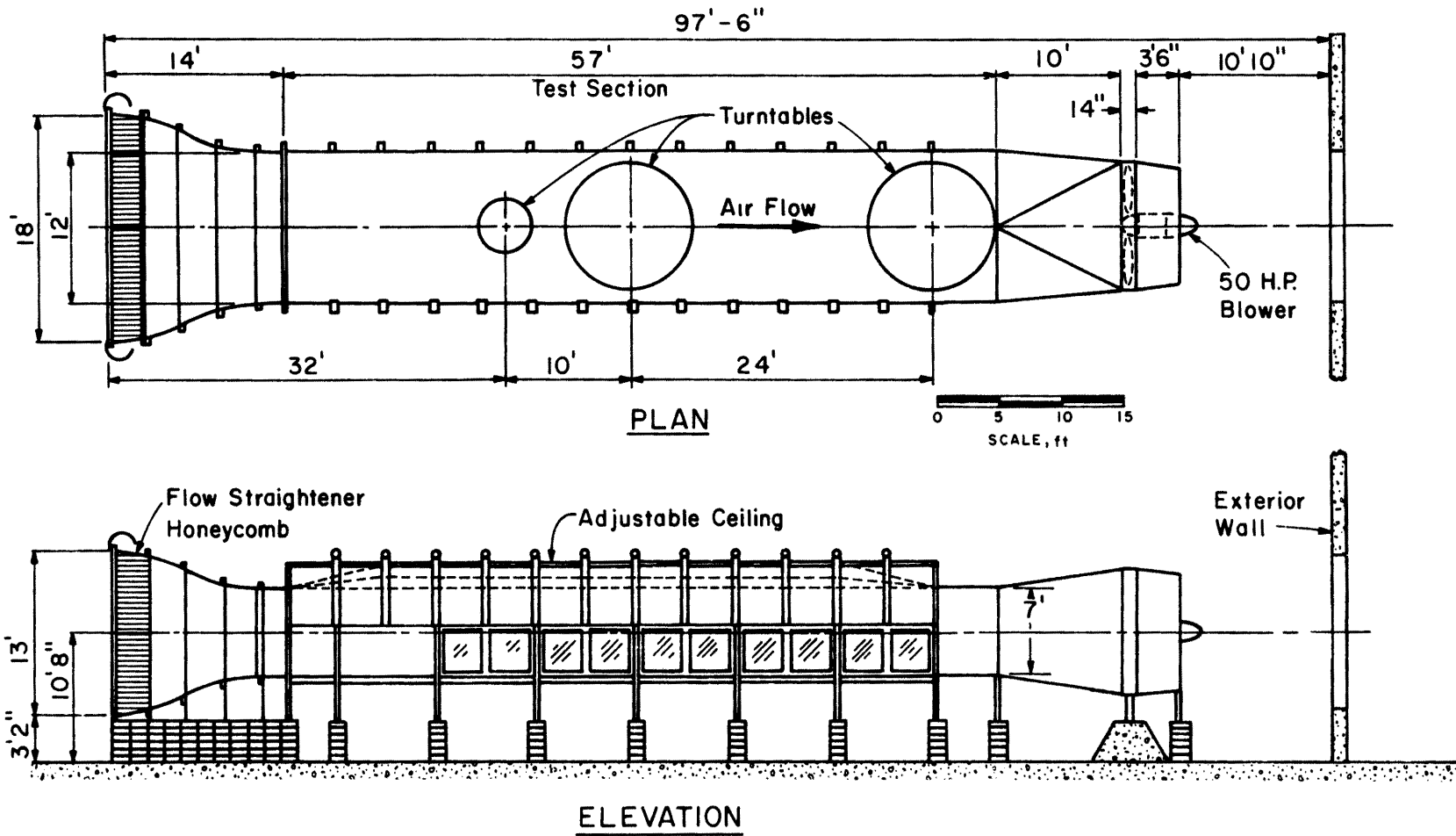
Figure 1. ENVIRONMENTAL WIND TUNNEL
FLUID DYNAMICS & DIFFUSION LABORATORY
COLORADO STATE UNIVERSITY
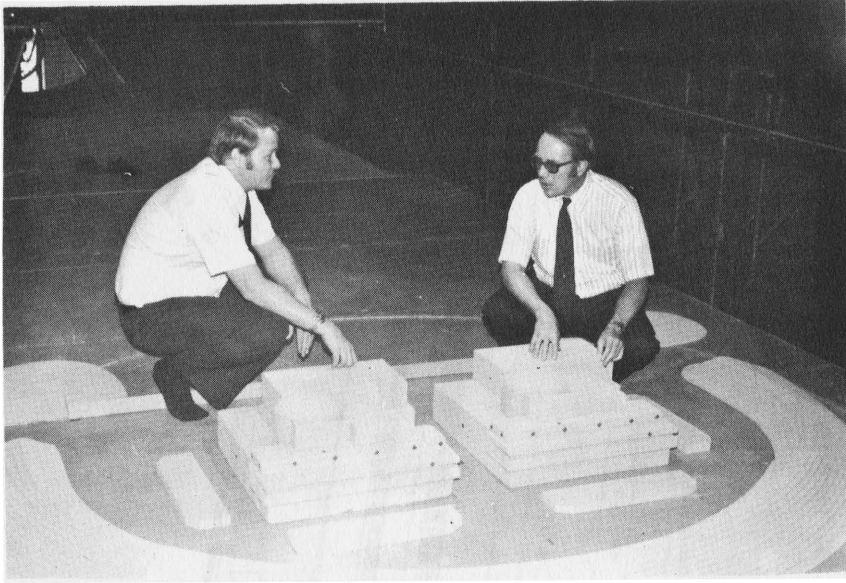
Figure 2. Model Offshore Power Systems Nuclear Power Station
          Scale: 1:200
          Environmental Wind Tunnel
          Colorado State University

310'

281'

253'

8 is Located
on the Far Side

174'

190'

8

7

6

9

5

1

4

2

3

11

10

PLANT A

30
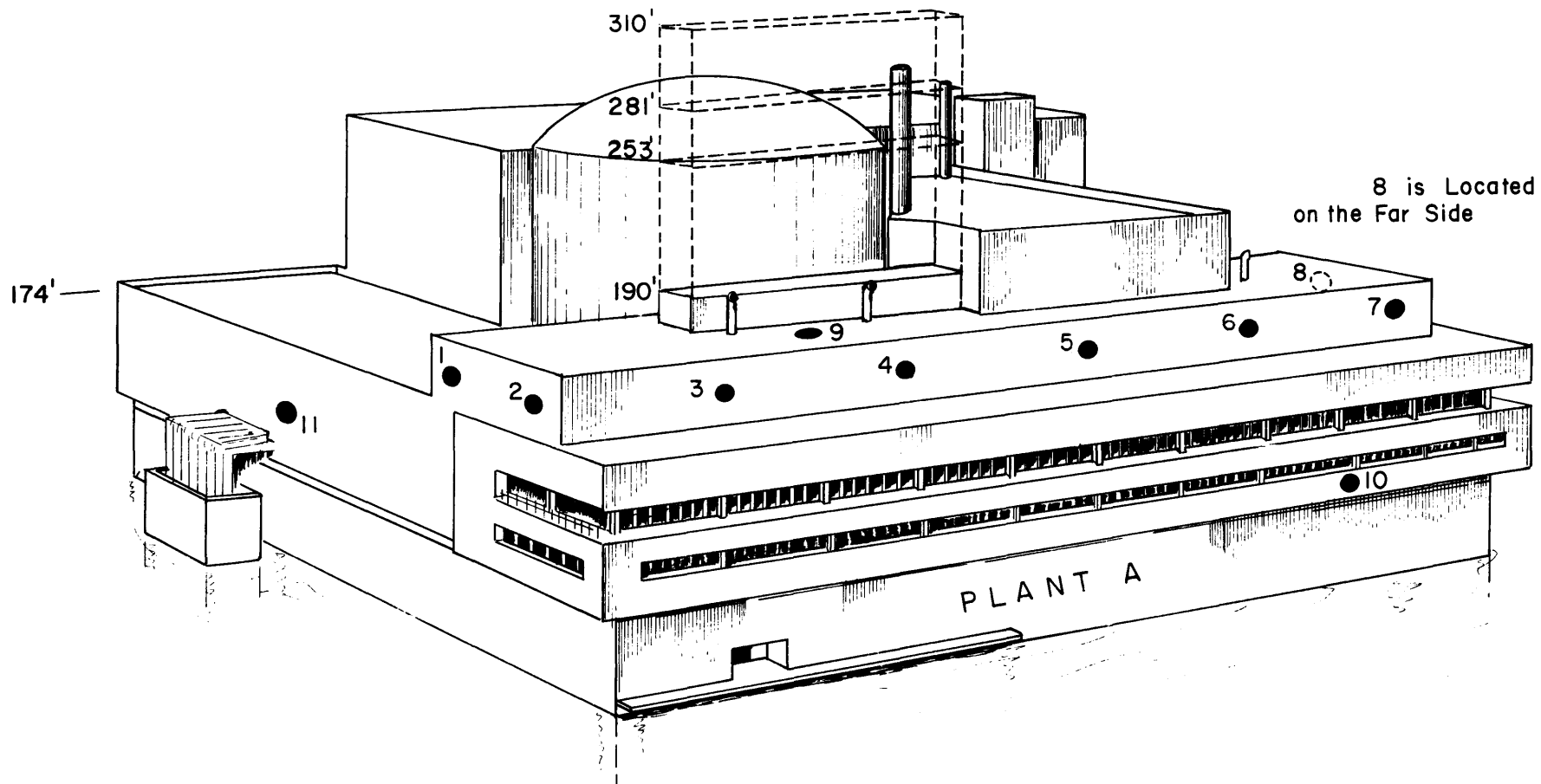
Nos. 1 — 11 are Sample Positions on Plant A

Nos. 15 – 25 are Sample Positions on Plant B

Nos. 12, 13, 14 are Adjacent to Position No. 9
at Elevations 281', 310', 340' Respectively

Fig. 3. Source and Sample Locations.

90

45

135

31

Diesel Intakes

A-1 xxxxxxxxxx

Plant A

A-2 xxxxxxxxxx

Control Room

Turbine Building

Diesel Intakes

B-1 xxxxxxxxxx

Plant B

B-2 xxxxxxxxxx

Control Room

Turbine Building

0

180

315

225

270
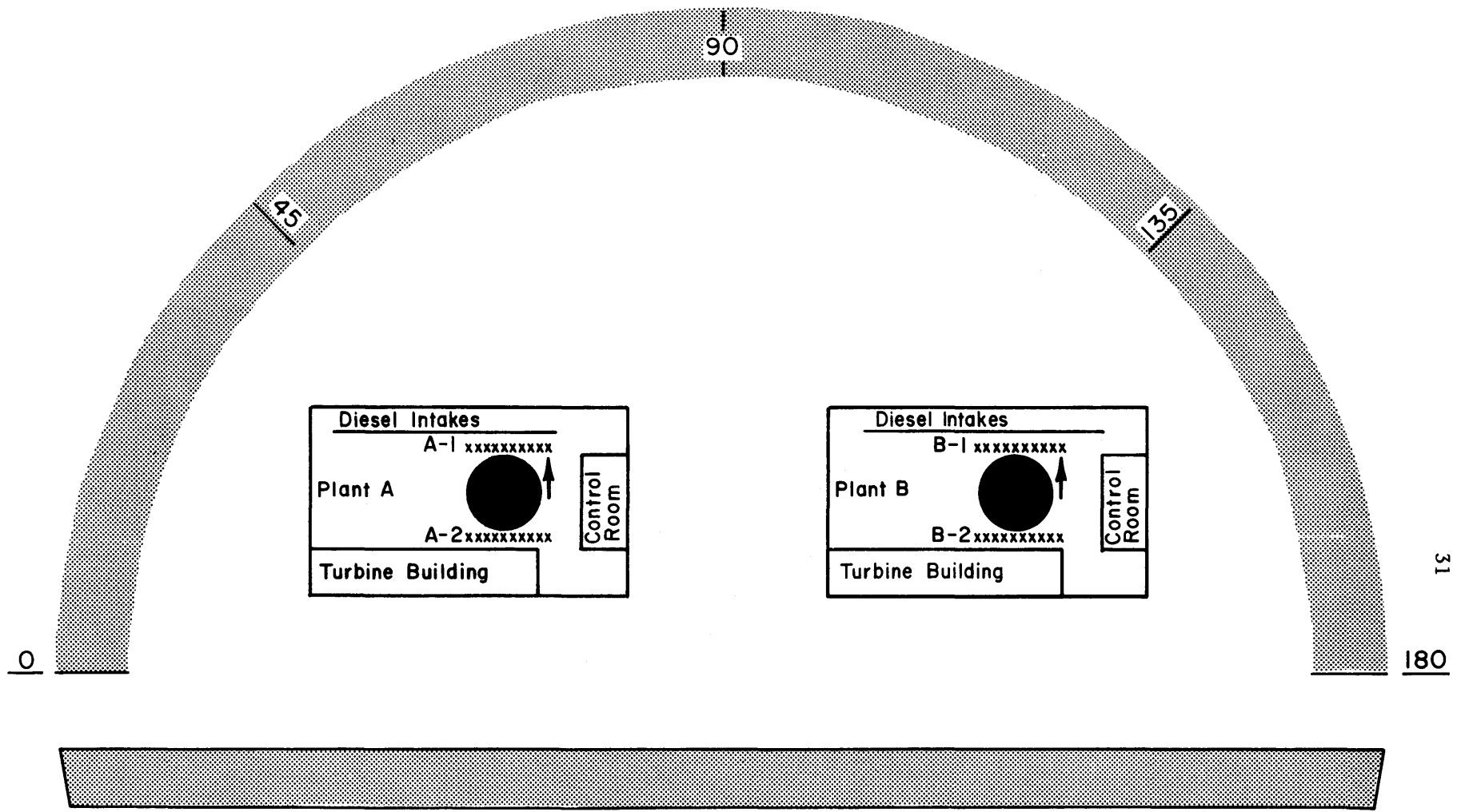
Note: A-1, A-2 are Steam
Exhaust Stacks which
Exhaust Steam in the
Vertical Direction

Arrow Indicates Location
and Direction of Release
During Steamline Rupture
(Circle Design)

Fig. 4. Model Orientation.
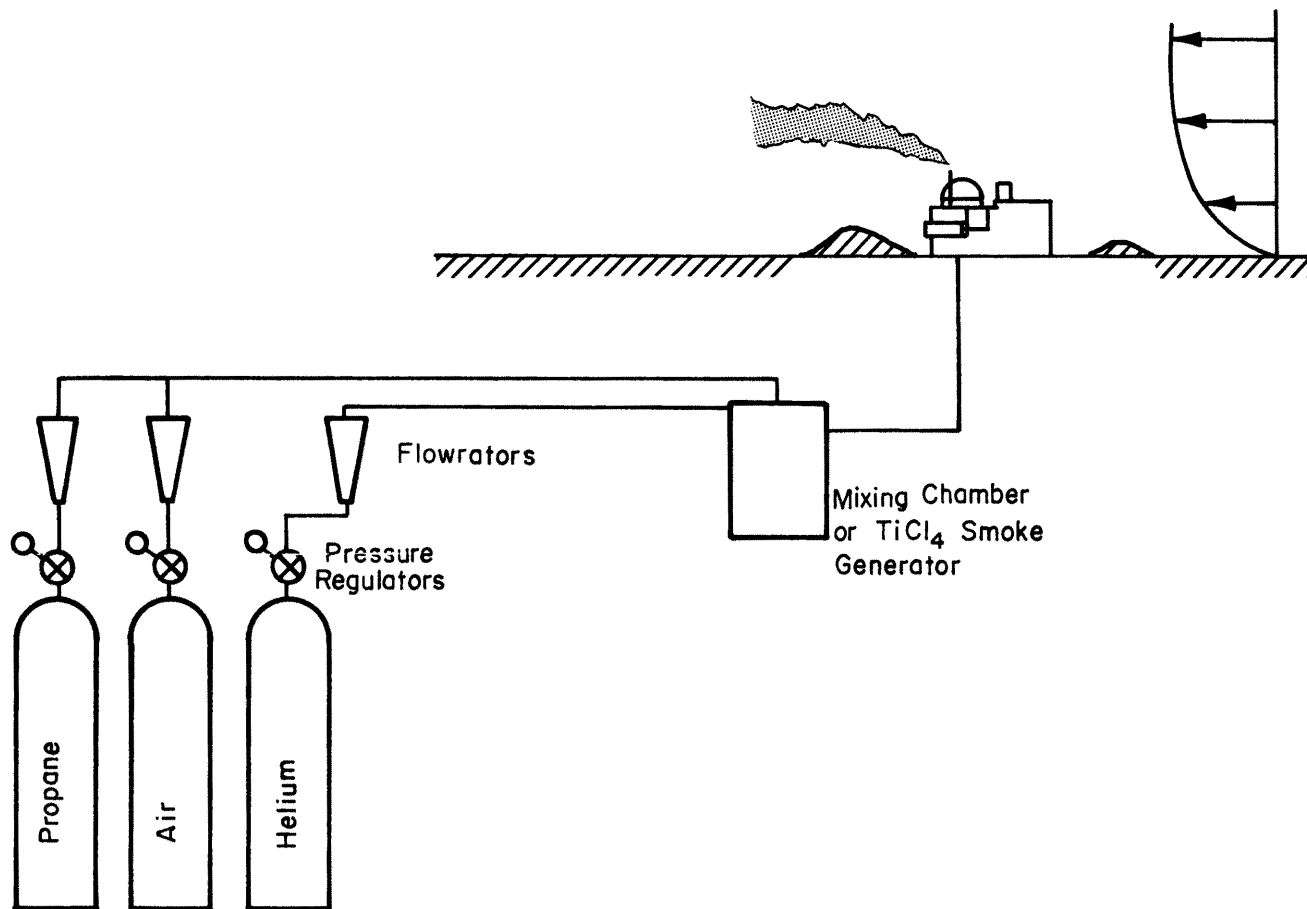
Fig. 5.   Model Gas Source and Visualization System.
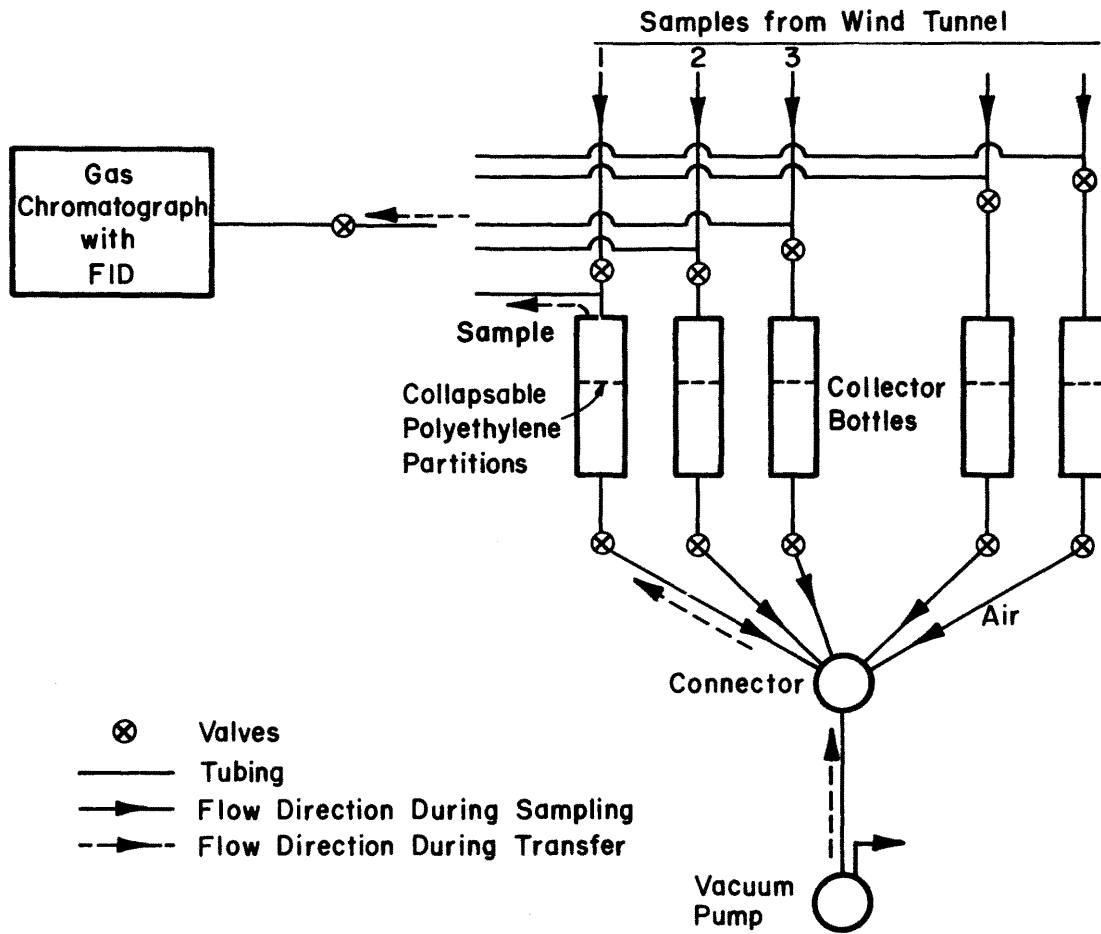
Fig. 6. Tracer Gas Sampling and Analysis System.

$$V = V_{ref} \left(\frac{z}{H}\right)^{0.13}$$

z = Height Above Tunnel Floor

H = Reference Height = Model Height = 16.8 in.
Prototype Height = 280 ft.

V_{ref} = Reference Velocity = 4.55 ft/sec
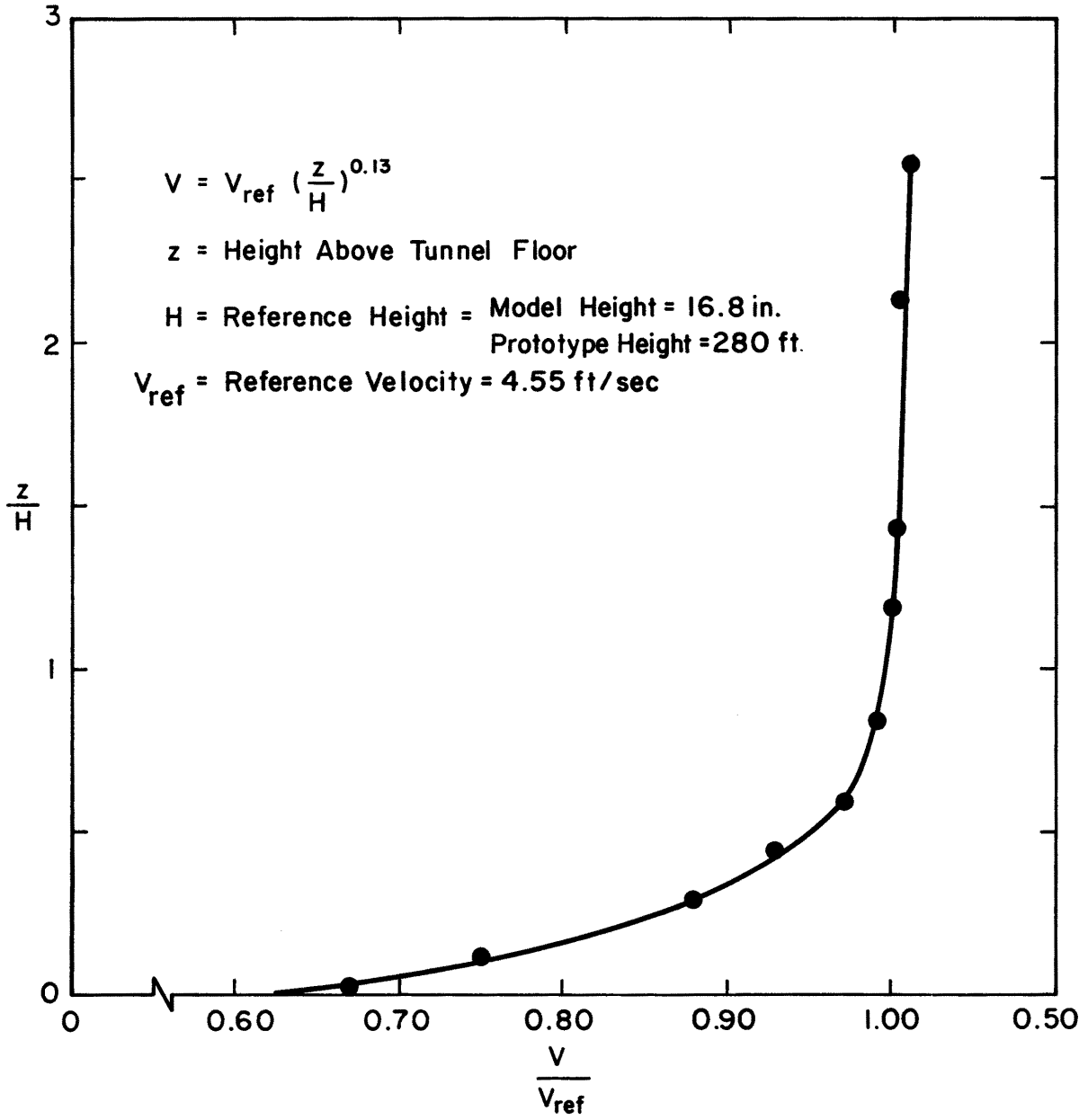
Fig. 7. Approach Velocity Profile.
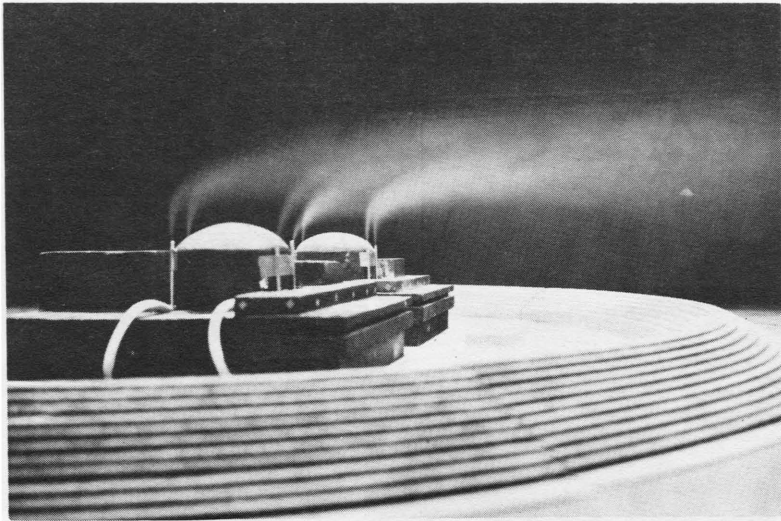
V = 140 ft/sec
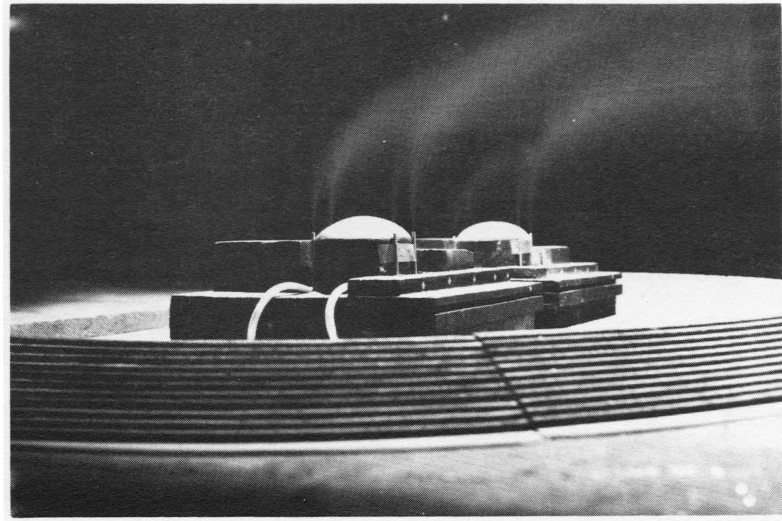
V = 35 ft/sec
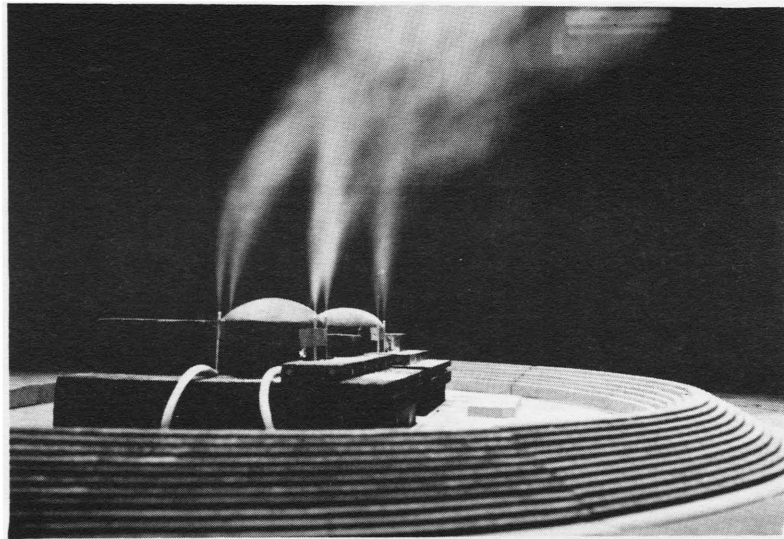
V = 5 ft/sec

Fig. 8. Flow Visualization
Loss of Grid Tests
$\theta = 270°$
$V_s = 1500$ ft/sec

θ = 225°

θ = 270°
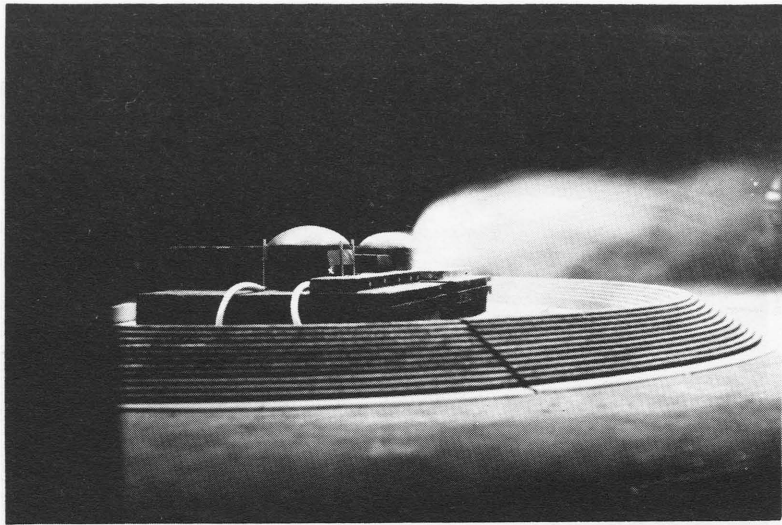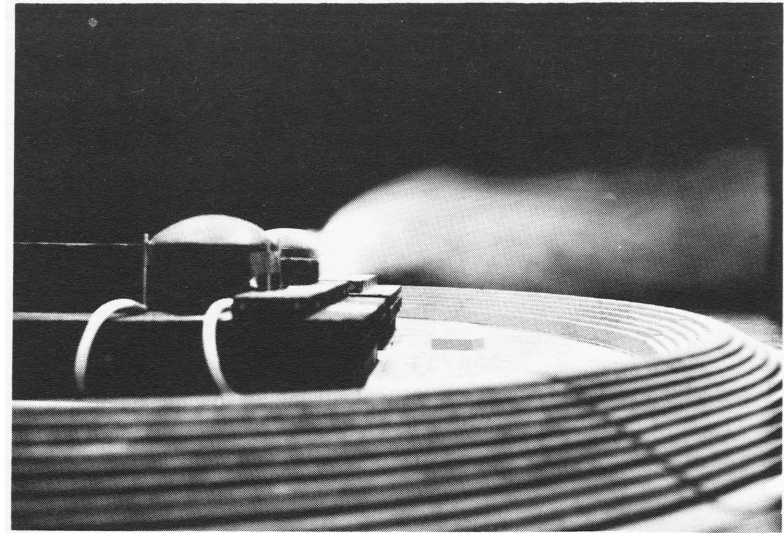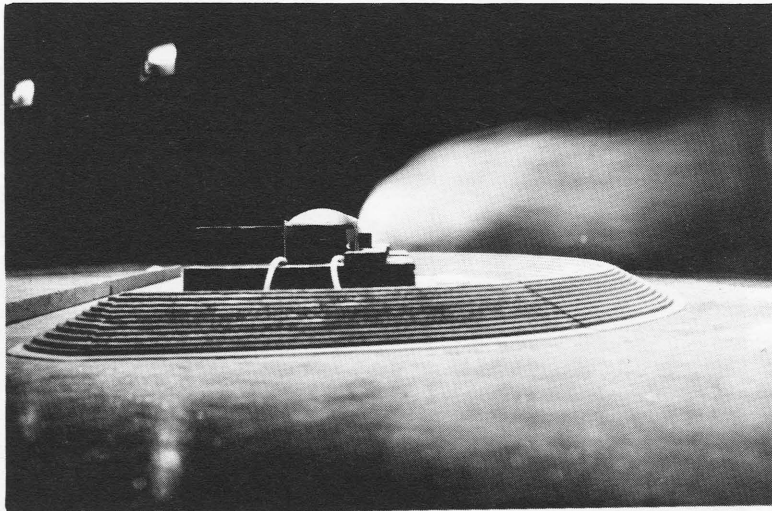
θ = 315°

Fig. 9. Flow Visualization
Steam Line Rupture A-1
V = 35 ft/sec
V_s = 32 ft/sec

H = Height of Release = 174 ft
θ = 315°
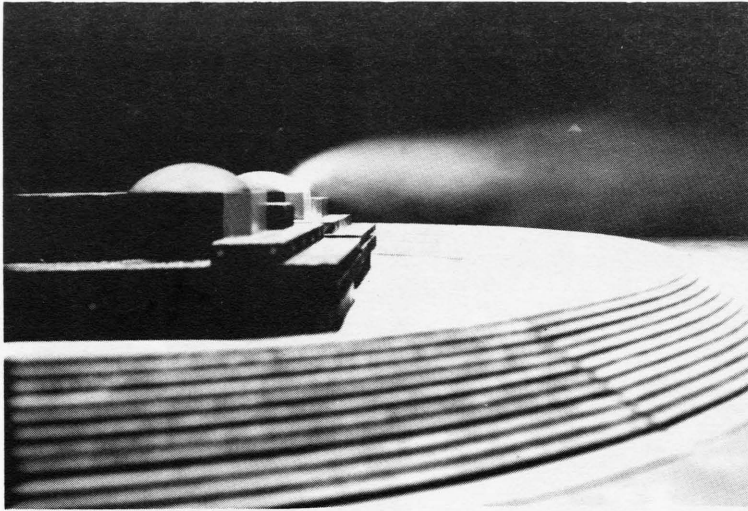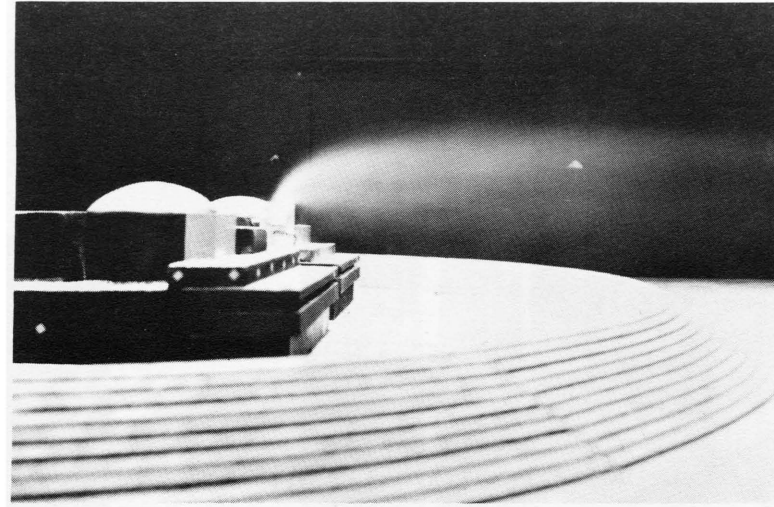
H = 253 ft

H = 281 ft
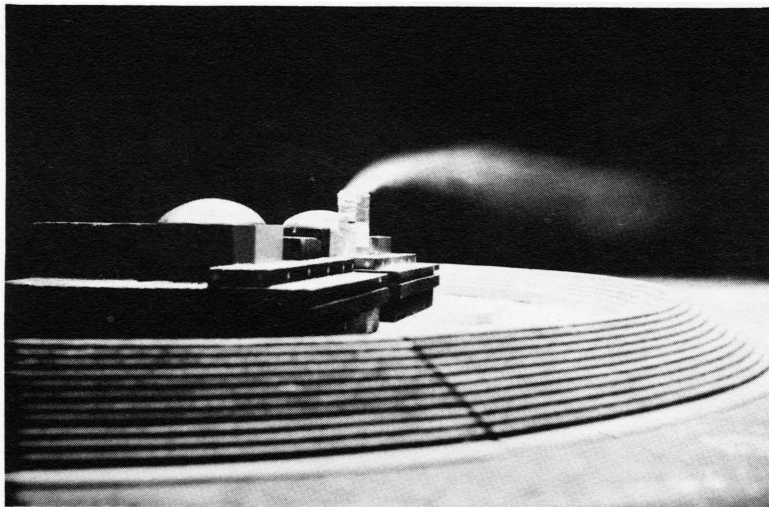
H = 310 ft

Fig. 10. Flow Visualization
Steam Line Rupture A-1
V = 35 ft/sec
V_S = 32 ft/sec
θ = 270°
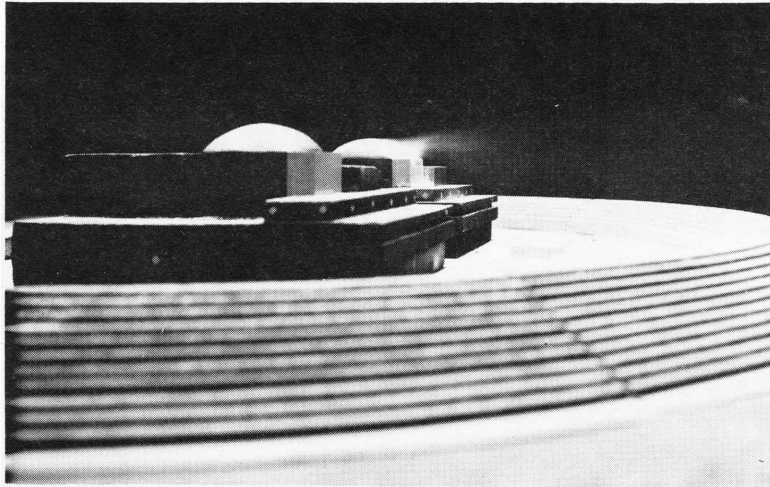
V = 190 ft/sec
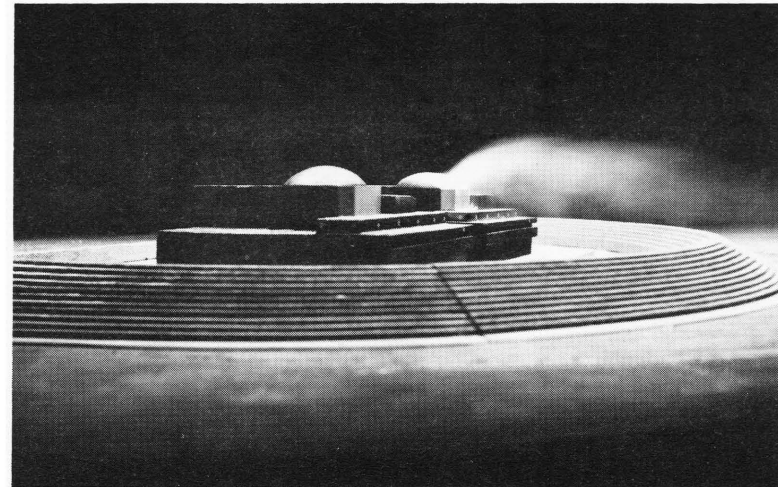
V = 35 ft/sec
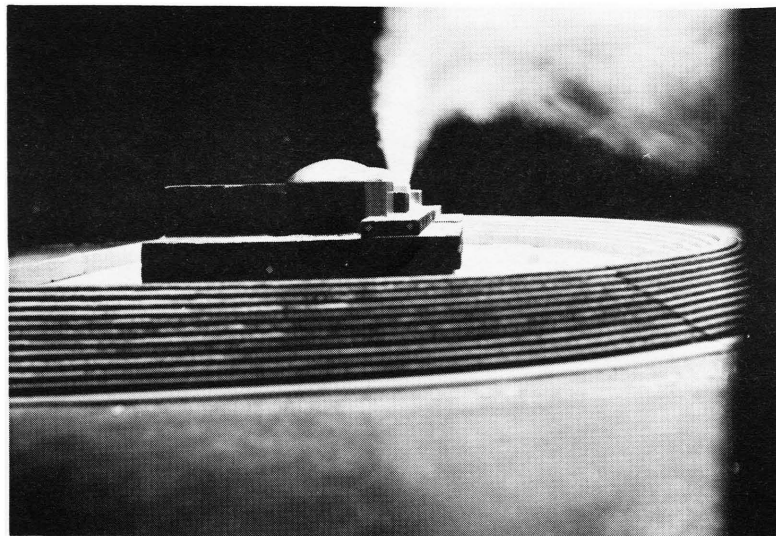
V = 5 ft/sec

Fig. 11. Flow Visualization
Steam Line Rupture A-1
V_s = 32 ft/sec
θ = 225°
H = 253 ft
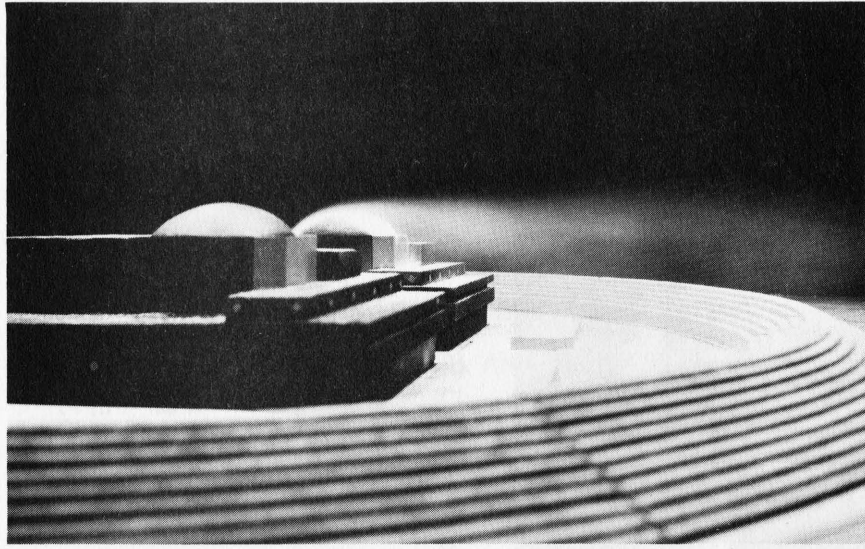
H = 253 ft
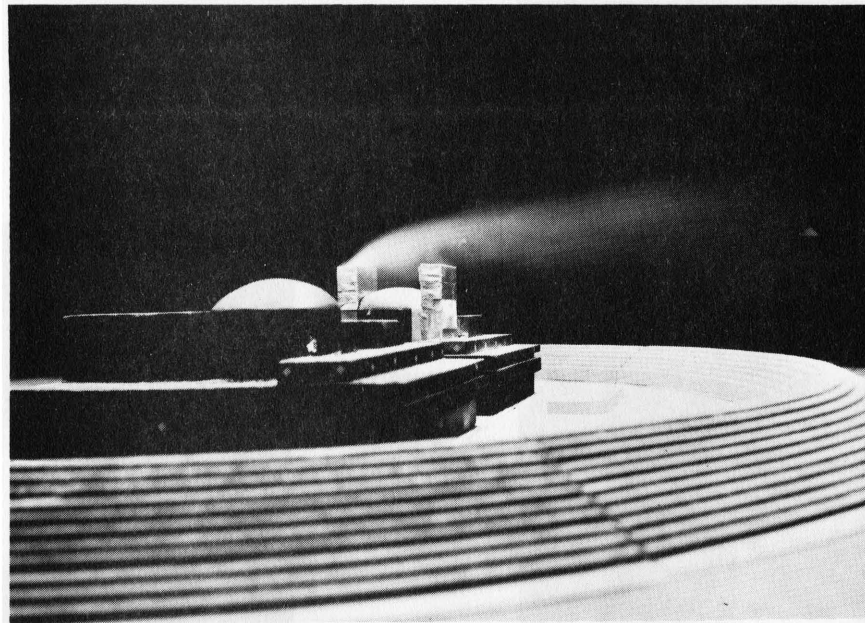
H = 310 ft

Fig. 12.   Flow Visualization
           Steam Line Rupture A-2
           V = 35 ft/sec
           V_S = 32 ft/sec
           θ = 270°
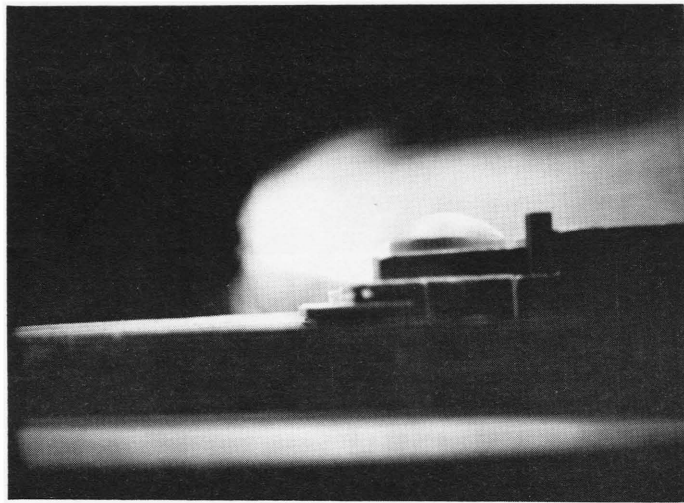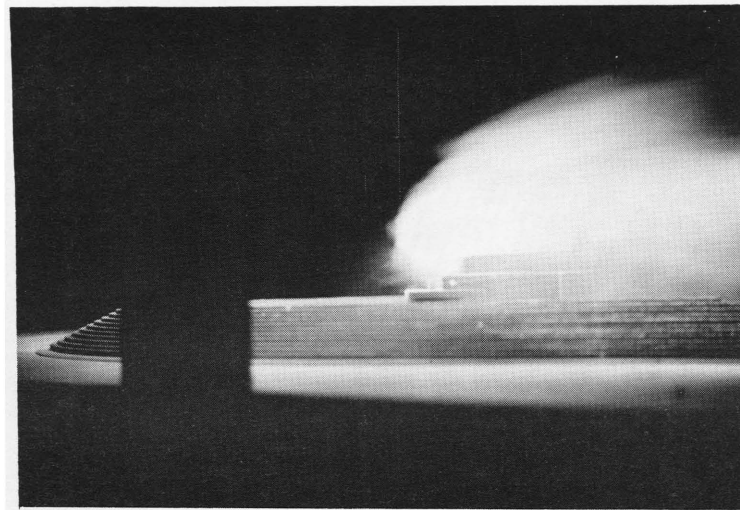
Building A   θ = 090°

Building A   θ = 135°

Fig. 13.   Flow Visualization
Steam Line Rupture (Circle Design)
V = 35 ft/sec
V_s = 1500 ft/sec
H = 233 ft

Building A   θ = 090°

PART II: FORCES AND MOMENTS

LIST OF SYMBOLS   Part II

Symbol	Definition
X, Y, Z	Coordinate system defined in Fig. 2
U	Mean velocity at gradient height
U_z	Mean velocity at height z
ν	Kinematic viscosity of air
ρ	Density of air
H	Nominal building height, 154 ft
CFX, CFY, CFZ	Force coefficients defined in Section 2.1
CMX, CMY, CMZ	Force coefficients defined in Section 2.1
FX, FY, FZ	Forces in X, Y, Z directions
MX, MY, MZ	Moments about X, Y, Z axes
Cp_{mean}	Mean pressure coefficient defined in Section 2.2

PART II: FORCES AND MOMENTS

1.0 Introduction, Modeling Configuration and Data Acquisition

1.1 Introduction

One of the important design considerations for a floating nuclear power plant is the loading on the individual reactor buildings due to wind. Because the plant site may be exposed to the full force of a hurricane, the magnitudes of wind forces and moments on the structures could become large. Prediction of overall forces and moments on the two reactor structures is complicated by the close proximity of the two buildings which can increase or decrease loads expected on a single unit depending on approach wind direction. Prediction of wind loads is further complicated by the existence of a breakwater surrounding the structures which should serve to decrease the wind loads.

The most practical technique to determine design wind loads on the reactor buildings is to measure loads on a scale model in a wind tunnel capable of appropriately modeling atmospheric winds. The study reported here describes a wind tunnel investigation to determine wind loads on the two reactor buildings of a proposed floating nuclear power plant. Wind loads on the structures were measured on the buildings alone and the buildings with four breakwater configurations.

1.2 Similarity Requirements and Approach Flow

Similarity requirements for modeling diffusion about a structure in an atmospheric wind were presented by Meroney et al. (1) in an earlier report on modeling of atmospheric dispersion of airborne materials released from a Floating Nuclear Power Plant. Further

discussions of similarity criteria for wind tunnel modeling can be found in references (2) and (3). The same criteria used in the earlier study, without the requirements associated with diffusion, are applicable to the modeling of flow about a structure and thus to the modeling of forces on the structure. Briefly, the requirements are that the model and prototype be scaled in geometry, that the approach mean velocity at the building site have a vertical profile shape similar to the full scale, that the turbulence characteristics of the flow be similar, and that the Reynolds number for the model and proto-type be equal.

These criteria were satisfied by constructing a scale model of the structure and its surroundings and performing the wind tests in a wind tunnel specifically designed to model atmospheric boundary layer flows. With a sufficient length of test section and appropriate roughness on the floor, the structure of mean velocity and turbulence intensity was scaled to the atmospheric flow. Reynolds number similarity requires that the quantity $U_Z H / \nu$ be similar for model and for prototype. Since ν, the kinematic viscosity of air is identical for both, Reynolds numbers cannot be made equal with reasonable wind velocities. Wind velocity in the wind tunnel would have to be the model scale factor times the prototype wind. However, for sufficiently high Reynolds number ($>2 \times 10^4$), the flow about a sharp edged structure and the surface pressures on the structure will be essentially constant with Reynolds number. Typical values might be 10^7 to 10^8 for the full scale and 10^5 to 10^6 for the wind tunnel model. Thus acceptable flow similarity was achieved without precise Reynolds number equality.

In order to provide a direct comparison with the earlier diffusion study on the same model (1), the study was performed in the same wind tunnel and using the same approach wind characteristics. These are discussed in the original report. The mean wind profile had a power law coefficient of 0.13 and a boundary layer thickness (gradient wind height) of 33 inches (1250 ft prototype).

1.3 The Model and Wind Tunnel

The model used for the wind tunnel tests was the 1:450 scale model buildings used in the previous wind tunnel study, (1). One modification was made to the structures: the elevator shaft housing was moved to the new location. A total of 185 pressure taps (1/16 in. holes drilled normal to the surface) were installed on one of the buildings in order to determine the surface pressure distribution which could then be integrated to determine forces and moments. Forces and moments were determined by integration of surface pressures rather than by direct measurement by a six-component strain gage drag balance because the expected moments on the structures were below the available balance resolution capability. Figure 1 shows the pressure tap locations on the instrumented reactor building drawn to scale. Force and moment distributions on the second reactor building were obtained by reversing positions of the instrumented and non-instrumented buildings. This was possible because the two buildings are identical in shape. The two reactor buildings are identified as building 1 and building 2 as shown in Fig. 2. The designations 1 and 2 refer to the buildings alpha and beta used in the previous report except that the elevator shaft housing has been moved.

The reactor buildings were tested with four breakwater configurations as shown in Fig.3. Breakwater "0" refers to no breakwater, breakwater 1 corresponds to the breakwater used in the original diffusion study, and breakwaters 2 through 4 are new designs. As in the original study, a smooth clean floor was used upstream of the model to develop the turbulent boundary layer flow. The smooth floor corresponds to an open ocean simulation.

The meteorological wind tunnel shown in Fig. 4 was used for this study. This wind tunnel, especially designed for modeling atmospheric flows includes a flexible ceiling for maintenance of a zero pressure gradient and a long test section (88 ft) to develop the boundary layer. The model was placed on a turntable located 85 ft from the test section entrance. Wind speeds of 0.2 to 130 ft/sec can be obtained in the 6x6 ft test section. Boundary layer thicknesses up to four feet can be obtained at the downstream end of the test section. A freestream velocity of 55 ft/sec was used for this study. This gave a Reynolds number based on model height and velocity at model height of approximately 10^5--sufficiently high to guarantee Reynolds number independence.

1.4 Data Acquisition

Mean pressures were obtained at 185 positions on each of the two reactor buildings by means of the pressure taps installed on one of the models. The pressure taps were connected to a 72 port pressure switch, 68 at a time, by means of 1/16 I.D. plastic tubing. The switch was located beneath the building underneath the wind tunnel floor, each of the four pressure transducers mounted close to the switch. The switch was operated manually and had an indexing feature to lock the switch into the 18 required positions. The four pressure switch input

taps not used for transmitting building pressures were connected to a common tube leading outside the wind tunnel. This arrangement provided both a means of performing in-place calibration of the transducers and a means of automatically monitoring the tunnel speed using this valve position.

The pressure transducers used were Statham differential strain gage transducers (Model PM 283 TC) with a 0.15 psia range. They were selected for their stability and linearity in the working range required. A reference pressure was obtained by connecting the reference side of the transducer with plastic tubing to the static side of a pitot tube mounted in the wind tunnel freestream above the model building. In this way, the transducer measured the instantaneous difference between the local surface pressure and the static pressure in the freestream above the model. The valve ports used to monitor velocity were connected to the dynamic pressure side of the pitot tube so that the pressure transducer measured directly the pitot tube differential pressure.

Each pressure transducer bridge was monitored by a Honeywell Accudata 118 Gage Control/Amplifier unit which supplied excitation to the bridge and amplified the bridge output. These instruments are characterized by a very stable excitation voltage and amplifier gain. Output from the Honeywell signal conditioners was fed to an on-line, 8 channel, System Development, Inc., analog-to-digital conversion unit. The data was processed onto digital tape for later analysis by computer. Resolution of conversion was ± 0.0016 in pressure coefficient (local pressure difference divided by the dynamic pressure of the freestream velocity). All four transducers were recorded simultaneously for

16 seconds at a 250 sample per second rate. This length of record allowed a stable mean pressure to be obtained. Experiments to determine the accuracy of the overall measurement system have shown that the error in mean pressures is less than 0.03 in pressure coefficient (4).

Reduction of the raw data to useable form was performed on the Colorado State University CDC 6400 computer as described in Section 2.1.

Data was obtained for a matrix of conditions: several wind directions (0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°), five breakwater configurations, and two combinations of buildings (1 and 2 buildings without breakwater). The model was mounted on a turntable for ease of changing wind direction and the breakwater models were fastened to the turntable in a fashion to allow rapid changes of breakwater configuration.

2.0 Data Analysis and Results

2.1 Calculation Procedure and Error Estimate

In order to convert mean pressure measurements on each model to mean force and moment coefficients, each pressure tap was assigned an area surrounding it for which the pressure tap measurement was considered representative. The pressure tap locations were originally determined by centering each tap in its respective area. A sufficient number of areas was established that the error due to the difference between actual average pressure over a surface and average pressure determined by the pressure port would be small.

Forces on the model were determined by vectorially summing the product of pressures determined at each port and the area associated with the port. The resulting force direction was taken parallel to a unit vector perpendicular to the surface. For the curved surfaces of the containment vessel, the unit vector was applied normal to the surface at the pressure tap location. Moments were determined by vectorially summing the product of the individual forces determined during the force calculation and the moment arm of the force about selected reference axes. Positive moments were determined by the right-hand rule. The coordinate system used is shown in Fig. 2.

Forces and moments were calculated as force and moment coefficients for convenience in transferring the model forces to full-scale forces. The three force coefficients referred to the three coordinate axes are defined as

$$CFX = \frac{FX}{(1/2)\rho U^2 H^2}$$

$$CFY = \frac{FY}{(1/2)\rho U^2 H^2}$$

$$CFZ = \frac{FZ}{(1/2)\rho U^2 H^2}$$

where CFX, CFY and CFZ are force coefficients in the positive X, Y and Z directions; FX, FY and FZ are the forces acting in the X, Y, and Z directions; H is 154 ft in the prototype which is the approximate height of the structure; and $(1/2)\rho U^2$ is the dynamic pressure of the wind at the upper edge of the wind tunnel boundary layer (corresponding to the gradient level wind velocity at 1250 ft in the atmosphere). The gradient wind velocity U in the atmosphere may be obtained from the mean velocity U_z at any other elevation z by the relationship

$$U = U_z \left(\frac{1250}{z}\right)^{0.13}$$

which expresses the variation of velocity with height in the wind tunnel and in the atmosphere.

The moments of forces about the reference axes of Fig. 2 are defined as

$$CMX = \frac{MX}{(1/2)\rho U^2 H^3}$$

$$CMY = \frac{MY}{(1/2)\rho U^2 H^3}$$

$$CMZ = \frac{MZ}{(1/2)\rho U^2 H^3}$$

where CMX, CMY and CMZ are moment coefficients about the X, Y and Z axes using the right-hand rule for sign convention; MX, MY and MZ are the moments about the axes.

Full-scale forces and moments can be obtained from the coefficients by multiplication by the gradient level mean wind dynamic pressure and by H^2 or H^3.

A test of the data analysis procedure was made to determine the approximate errors involved in the force and moment tests. The data analysis program was run with fictitious data providing a pressure equal to the free stream dynamic pressure at every pressure port. The result of this analysis should be forces in the X and Y directions of zero and forces in the negative Z direction of the pressure times the projected plan cross-sectional area. The moments calculated from this input data should also be close to zero. The resulting force and moment coefficients indicated an error of less than 10 percent in all coefficients except CMZ (the smallest error was in CFZ at two percent). Due to the small values of CMZ occurring during the wind tunnel tests, the error in this value was less than 20 percent.

No attempt was made to estimate the error due to the approximation that the pressure tap represents the average pressure over its representative area. With the large number of taps on the structure, this error should be small. A total error estimate of 15 percent for force and moment coefficients--including the 10 percent error plus the unknown small averaging error--is a reasonably conservative estimate of accuracy. For CMZ, an error estimate of approximately 20 to 25 percent is a reasonable error estimate.

2.2 Force and Moment Results

The force and moment coefficients for the matrix of test conditions
are given in Table 1. In the table, breakwater configurations are given
as configurations 0 through 4 as discussed in Section 1.3 and Fig. 3.
The building numbers are listed as 0, 1 and 2. The configuration 0
refers to a single reactor building without the second building present.
This configuration was never tested with breakwaters present--only with
the breakwater 0 configuration which was "no breakwater." Buildings 1
and 2 are discussed in Section 1.3 and Fig. 2. The mean pressures
at each location on the building for each wind direction, from which
the forces and moments were calculated, are listed in Table 2. These
pressures are given in the form of mean pressure coefficients:

$$Cp_{mean} = \frac{\Delta P}{(1/2)\rho U^2}$$

where ΔP is the mean pressure difference between the tap location and
the static pressure in the free stream.

The relative magnitudes of the force and moment coefficients as
wind direction and breakwater configuration are changed give the
relative magnitudes of the prototype forces and moments since a constant
factor is applied to forces and another to moments to convert to full-
scale values. An indication of force and moment variations with wind
direction and with breakwater configuration can be obtained by appro-
priate plots. Figure 5 shows CFX as a function of angle for three
breakwater/building configurations. As might be expected, a single
reactor building by itself experiences generally higher forces than
when protected by a breakwater and an adjacent building. Also, the
upwind structure experiences a significantly higher force than the

downstream building. A wind of 45 degrees to the coordinate system produces a higher force on the structure than those parallel to the coordinate system. This is an unusual result and must be due, at least in part, to a lack of complete flow separation over the top of the structure.

Force coefficients in the Y direction, CFY, are shown in Fig. 6. Variations in force due to breakwater configuration and the addition of a second building are not as large as for the X direction since the two effects tend to cancel rather than add as in the previous case. The presence of the second building tends to slightly increase the load on the first for wind directions causing the largest CFY. Presence of the breakwater tends to decrease loading more than the adjacent building tends to increase loading.

The effects of the breakwater configuration on CMX and CMY is shown in Fig. 7. Two wind directions for which maximum loads were observed were selected for plotting for each of the buildings to show the breakwater protection when it is most effective. It is evident that breakwater 2 provides the best overall protection although for some cases breakwater 4 provides an effective reduction in loads.

The largest moments acting on the structures are in the CMX coefficient for a wind direction of 270 degrees. As shown in Fig. 8, the moment at other wind directions is considerably smaller. The effects of the adjacent building and of the breakwater are relatively small except at 90 degrees. Moments about the other axes are relatively small in comparison with the largest CMX as shown in Table 1.

3.0 Conclusions

A 1:450 scale model of a proposed floating nuclear power plant was tested for wind loading in a wind tunnel capable of simulating the atmospheric winds to which the power plant might be exposed in the open ocean. Surface pressures were measured on both reactor buildings of the proposed plant and were integrated to determine three components of force and three moments about orthogonal axes.

Results of the investigation showed a significant reduction in loads on the structures due to the presence of any of the four break- waters tested in comparison to the case without breakwater. The highest breakwater had the most beneficial effect on wind loads although a shorter breakwater with vertical sides showed large reductions in loading for some wind directions. The lack of symmetry in the build- ings and in the breakwater were evident in the forces and moments measured at varying wind directions on the model. These forces and moments could not have been estimated with accuracy except by wind tunnel tests.

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TABLE 1   FORCE AND MOMENT COEFFICIENTS

WIND	BREAKWATER	BUILDING	CFX	CFY	CFZ	CMX	CMY	CMZ
0	0	0	-1.1947	.3001	2.2905	-.0601	-1.0034	.4947
0	0	1	-1.0624	.4075	1.8255	-.0136	-.9824	.4967
0	0	2	-.1238	-.2419	.6479	.0365	.0785	.0792
0	1	1	-.7468	.1505	1.0351	.0400	-.4586	.5555
0	1	2	-.1836	-.1852	.4893	.0350	.0755	.1168
0	2	1	-.2382	-.0622	.6881	.0178	-.1302	.3286
0	2	2	-.1323	-.1690	.3701	.0013	.0552	.1020
0	3	1	-.7803	.1012	.9224	.0519	-.4607	.5159
0	3	2	-.2163	-.2098	.5045	.0305	.0651	.1146
0	4	1	-.2926	.0619	.5765	.0419	-.0972	.2188
0	4	2	-.0457	-.1196	.3254	.0155	.0660	.0584
45	0	0	-1.3745	.9849	2.3005	-.0203	-.2514	.3079
45	0	1	-1.1771	1.1303	2.0114	-.1160	-.2991	.1816
45	0	2	-.3736	.8894	1.8740	-.2607	-.0141	.3576
45	1	1	-.9584	.8807	1.2592	.1356	-.1652	.2596
45	1	2	-.3952	.8106	1.1071	.0623	.0055	.3102
45	2	1	-.4645	.4205	.8056	.1140	-.0537	.2991
45	2	2	-.3355	.5383	.8889	.1770	.1143	.1563
45	3	1	-.7721	.7435	1.0377	.0536	-.1234	.2298
45	3	2	-.3479	.7845	1.0474	.0818	.0014	.2756
45	4	1	-.6865	.5913	.9119	.1749	-.0698	.2973
45	4	2	-.0583	.2624	.9432	.1926	.1748	.0713
90	0	0	.0011	.7161	1.9607	-.6771	.0733	.0588
90	0	1	.0562	.7438	1.9082	-.6720	.0938	.0787
90	0	2	.1305	.6437	1.9604	-.6394	.0973	.0899
90	1	1	.0857	.6048	.9851	.0481	.0572	.1542
90	1	2	.0848	.5067	.9657	.0808	.0895	.1055
90	2	1	.1588	.3705	.8037	.0887	.0619	.0970
90	2	2	-.0118	.1047	.9669	.0961	.0845	-.0121
90	3	1	.0823	.6078	.9145	.0463	.0971	.1090
90	3	2	.1101	.5610	.9960	.0570	.0669	.0128
90	4	1	.1557	.4696	.7746	.1075	.0774	.1421
90	4	2	.0257	.2834	.9136	.0784	.0711	-.0329
135	0	0	1.3746	.8078	1.8203	-.3848	.3228	-.0138
135	1	1	.4426	.7621	.8440	-.1835	.0310	-.0310
135	1	2	1.1717	.6348	.8136	-.0708	.1488	-.0196
180	0	0	1.1834	-.0597	2.1569	-.0893	.7646	-.0642
180	1	1	.3771	-.0714	.5135	.0268	.0562	.0144
180	1	2	.7842	-.1894	.7997	.0209	.1496	-.2561
225	0	0	1.2075	-1.3127	2.5895	.4487	.3743	-.1790
225	1	1	.4652	-.8478	1.8534	.5431	.0134	-.0678
225	1	2	1.3590	-1.3644	1.9716	.5692	.3377	-.5535
270	0	0	.1407	-1.3195	2.6942	1.5925	-.0466	-.3326
270	0	1	.0908	-1.4286	2.7544	1.6487	-.0354	-.2811
270	0	2	.2463	-1.4480	2.7263	1.6473	.0042	-.4495
270	1	1	.0042	-1.2483	2.1660	1.3585	-.1286	-.2992
270	1	2	.1991	-1.3963	2.1060	1.4320	-.0812	-.3266
270	2	1	-.0105	-1.1096	1.6816	1.1987	-.1324	-.2681
270	2	2	.1665	-1.2857	1.8537	1.2804	-.0866	-.3182
270	3	1	-.0318	-1.2870	1.9980	1.3360	-.1366	-.2882
270	3	2	.1742	-1.4480	2.0870	1.3366	-.1728	-.3002
270	4	1	.0661	-1.2226	1.8161	1.3314	-.1076	-.3422
270	4	2	.1543	-1.3342	1.8910	1.3996	-.0678	-.3159
315	0	0	-1.2503	-1.2330	2.7869	.8661	-.6235	-.0423
315	1	1	-1.0094	-1.1769	2.1904	.8580	-.5454	.1172
315	1	2	-.5742	-.9159	2.0418	.8147	-.3205	-.1322

TABLE 2 MEAN PRESSURE COEFFICIENTS

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 0   BREAKWATER 0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.778	38	-.424	75	.543	112	-.171	150	-.126
2	-.570	39	-.627	76	.613	113	-.142	151	-.045
3	-.428	40	-.542	77	.593	114	-.044	152	-.125
4	-.264	41	-.670	78	.515	115	-.125	153	-.141
5	-.215	42	-.370	79	.572	116	-.439	154	-.164
6	-.788	43	-.417	80	.581	117	-.422	155	-.090
7	-.651	44	-.437	81	.288	118	-.234	156	-.191
8	-.376	45	.148	82	.503	119	-.222	157	-.187
9	-.263	46	.373	83	.458	120	-.155	158	-.222
10	-.136	47	-.615	84	.511	121	-.122	159	-.136
11	-.740	48	-.404	85	.403	122	-.031	160	-.231
12	-.604	49	-.350	86	.464	123	-.113	161	-.214
13	-.452	50	-.185	87	.408	124	-.641	162	-.229
14	-.220	51	-.254	88	.355	125	-.433	163	-.136
15	-.262	52	-.220	89	.325	126	-.274	164	-.234
16	-.282	53	-.191	90	.158	127	-.236	165	-.330
17	-.246	54	-.082	91	-.127	128	-.210	166	-.515
18	-.179	55	-.558	92	-.214	129	-.194	167	-.568
19	-.278	56	-.348	93	.332	130	-.075	168	-.661
20	-.271	57	-.291	94	.467	131	-.131	169	-.205
21	-.263	58	-.164	95	.242	132	-.287	170	-.320
22	-.159	59	-.297	96	.275	133	-.124	171	-.404
23	-.261	60	-.442	97	.377	134	-.650	172	-.652
24	-.249	61	-.415	98	.475	135	-.562	173	-.615
25	-.266	62	-.021	99	.367	136	-.336	174	-.185
26	-.150	63	-.422	100	-.479	137	-.206	175	-.192
27	-.290	64	-.323	101	-.479	138	-.398	176	-.453
28	-.343	65	-.271	102	-.291	139	-.451	177	-.631
29	-.239	66	-.141	103	-.278	140	-.126	178	-.640
30	-.248	67	-.242	104	-.205	141	-.130	179	-.065
31	-.575	68	-.303	105	-.165	142	-.039	180	-.165
32	-.384	69	-.306	106	-.056	144	-.135	181	-.134
33	-.308	70	-.236	107	-.130	145	-.159	182	-.137
34	-.171	71	-.397	108	-.446	146	-.178	183	.253
35	-.243	72	-.215	109	-.479	147	-.095	184	.324
36	-.238	73	-.204	110	-.273	148	-.193	185	-.306
37	-.573	74	-.159	111	-.244	149	-.191	186	-.252

WIND DIRECTION 0   BREAKWATER 0 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.696	38	-.365	75	.512	112	-.112	150	-.047
2	-.510	39	-.536	76	.586	113	-.098	151	.008
3	-.378	40	-.463	77	.575	114	.005	152	-.062
4	-.221	41	-.587	78	.522	115	-.047	153	-.026
5	-.178	42	-.304	79	.566	116	-.354	154	.023
6	-.712	43	-.509	80	.573	117	-.331	155	.102
7	-.592	44	-.332	81	.307	118	-.159	156	-.022
8	-.344	45	.199	82	.494	119	-.164	157	-.111
9	-.230	46	.413	83	.445	120	-.103	158	-.206
10	-.098	47	-.490	84	.535	121	-.077	159	-.145
11	-.672	48	-.316	85	.412	122	.011	160	-.263
12	-.540	49	-.257	86	.479	123	-.052	161	-.193
13	-.418	50	-.102	87	.421	124	-.568	162	-.224
14	-.197	51	-.153	88	.380	125	-.369	163	-.141
15	-.209	52	-.123	89	.341	126	-.280	164	-.244
16	-.242	53	-.098	90	.141	127	-.191	165	-.324
17	-.165	54	.015	91	-.154	128	-.146	166	-.503
18	-.141	55	-.452	92	-.208	129	-.128	167	-.548
19	-.196	56	-.278	93	.325	130	-.024	168	-.645
20	-.201	57	-.235	94	.473	131	-.073	169	-.200
21	-.204	58	-.105	95	.260	132	-.239	170	-.317
22	-.104	59	-.184	96	.271	133	-.123	171	-.401
23	-.189	60	-.299	97	.379	134	-.598	172	-.651
24	-.190	61	-.303	98	.476	135	-.489	173	-.587
25	-.192	62	.008	99	.367	136	-.263	174	-.179
26	-.130	63	-.365	100	-.394	137	-.147	175	-.206
27	-.250	64	-.266	101	-.357	138	-.376	176	-.482
28	-.284	65	-.205	102	-.207	139	-.452	177	-.604
29	-.203	66	-.086	103	-.201	140	-.057	178	-.611
30	-.240	67	-.177	104	-.132	141	-.095	179	-.028
31	-.452	68	-.189	105	-.102	142	.008	180	-.162
32	-.276	69	-.227	106	-.006	144	-.090	181	-.087
33	-.205	70	-.219	107	-.058	145	-.124	182	-.115
34	-.091	71	-.364	108	-.351	146	-.136	183	.213
35	-.168	72	-.187	109	-.374	147	-.082	184	.348
36	-.116	73	-.174	110	-.189	148	-.197	185	-.303
37	-.497	74	-.078	111	-.180	149	-.175	186	-.242

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   0   BREAKWATER   0 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.080	38	.028	75	.226	112	-.122	150	-.074
2	.036	39	-.069	76	.169	113	-.117	151	0.000
3	-.065	40	-.027	77	.014	114	-.032	152	-.065
4	-.078	41	-.102	78	.170	115	-.136	153	-.056
5	-.113	42	.043	79	-.039	116	-.175	154	-.054
6	.023	43	-.112	80	-.104	117	-.150	155	.021
7	-.045	44	-.069	81	.080	118	-.055	156	-.062
8	-.065	45	-.114	82	.138	119	-.144	157	-.060
9	-.094	46	-.012	83	.004	120	-.120	158	-.087
10	-.034	47	-.171	84	-.125	121	-.112	159	-.008
11	-.056	48	-.129	85	-.041	122	-.033	160	-.087
12	-.065	49	-.139	86	-.041	123	-.131	161	-.086
13	-.073	50	-.048	87	-.119	124	-.134	162	-.090
14	-.017	51	-.137	88	-.110	125	-.109	163	-.011
15	-.148	52	-.135	89	-.106	126	-.046	164	-.043
16	-.160	53	-.136	90	.043	127	-.101	165	-.016
17	-.174	54	-.042	91	-.072	128	-.134	166	-.005
18	-.170	55	-.315	92	.003	129	-.142	167	.079
19	-.172	56	-.276	93	-.080	130	-.043	168	-.052
20	-.170	57	-.196	94	-.046	131	-.134	169	-.018
21	-.174	58	-.071	95	-.125	132	-.105	170	-0.000
22	-.073	59	-.197	96	-.102	133	-.088	171	.084
23	-.174	60	-.295	97	-.032	134	-.009	172	.023
24	-.171	61	-.227	98	-.041	135	-.132	173	.010
25	-.171	62	.029	99	-.129	136	-.110	174	.001
26	.015	63	-.129	100	-.176	137	-.052	175	.081
27	-.055	64	-.170	101	-.153	138	.058	176	.032
28	-.077	65	-.159	102	-.059	139	.041	177	.044
29	-.090	66	-.072	103	-.153	140	-.082	178	.056
30	-.014	67	-.169	104	-.131	141	-.081	179	.036
31	-.137	68	-.263	105	-.123	142	-.004	180	-.028
32	-.115	69	-.216	106	-.035	144	-.062	181	-.030
33	-.144	70	.091	107	-.135	145	-.051	182	-.013
34	-.048	71	-.071	108	-.170	146	-.048	183	.008
35	-.162	72	-.151	109	-.150	147	.032	184	-.020
36	-.141	73	-.137	110	-.057	148	-.054	185	-.002
37	-.108	74	-.073	111	-.145	149	-.054	186	-.111

WIND DIRECTION   0   BREAKWATER   1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.618	38	-.160	75	.632	112	-.123	150	-.050
2	-.191	39	-.413	76	.643	113	-.098	151	.012
3	-.132	40	-.179	77	.562	114	.012	152	-.041
4	-.123	41	-.417	78	.339	115	-.045	153	.006
5	-.134	42	-.025	79	.277	116	-.179	154	.067
6	-.552	43	-.362	80	.203	117	-.180	155	.153
7	-.237	44	-.156	81	.237	118	-.073	156	.007
8	-.132	45	.270	82	.411	119	-.137	157	-.115
9	-.139	46	.329	83	.319	120	-.114	158	-.171
10	-.069	47	-.179	84	.164	121	-.087	159	-.096
11	-.229	48	-.135	85	.227	122	.015	160	-.206
12	-.257	49	-.216	86	.388	123	-.047	161	-.162
13	-.181	50	-.090	87	.314	124	-.174	162	-.177
14	-.068	51	-.144	88	-.002	125	-.205	163	-.099
15	-.174	52	-.128	89	-.008	126	-.117	164	-.152
16	-.192	53	-.103	90	.477	127	-.089	165	-.108
17	-.179	54	.002	91	.436	128	-.128	166	-.129
18	-.107	55	-.503	92	.237	129	-.117	167	-.205
19	-.184	56	-.319	93	.140	130	-.001	168	-.626
20	-.175	57	-.211	94	.045	131	-.054	169	-.090
21	-.176	58	-.082	95	-.029	132	.130	170	-.082
22	-.090	59	-.177	96	-.119	133	.108	171	-.020
23	-.179	60	-.344	97	-.052	134	-.302	172	-.255
24	-.179	61	-.377	98	-.004	135	-.403	173	-.604
25	-.168	62	.144	99	-.150	136	-.202	174	-.074
26	.235	63	-.229	100	-.195	137	-.107	175	-.002
27	.340	64	-.193	101	-.197	138	-.224	176	-.101
28	.257	65	-.180	102	-.094	139	-.128	177	-.086
29	.113	66	-.087	103	-.169	140	-.060	178	-.384
30	.040	67	-.162	104	-.141	141	-.084	179	-.008
31	-.393	68	-.151	105	-.110	142	.003	180	-.118
32	-.190	69	-.326	106	.004	144	-.065	181	-.064
33	-.170	70	.204	107	-.053	145	-.091	182	-.070
34	-.069	71	-.172	108	-.190	146	-.091	183	.289
35	-.153	72	-.154	109	-.191	147	-.031	184	.273
36	-.113	73	-.139	110	-.065	148	-.195	185	-.065
37	-.352	74	-.036	111	-.149	149	-.150	186	-.194

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   0   BREAKWATER   1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.103	38	.092	75	.307	112	-.090	150	-.068
2	.031	39	-.028	76	.199	113	-.085	151	.004
3	-.070	40	.115	77	.076	114	-.006	152	-.060
4	-.072	41	-.041	78	.237	115	-.124	153	-.044
5	-.096	42	.125	79	-.015	116	-.138	154	-.038
6	.017	43	-.088	80	-.061	117	-.126	155	.047
7	-.044	44	-.052	81	.069	118	-.029	156	-.028
8	-.051	45	-.023	82	.154	119	-.110	157	-.020
9	-.078	46	.058	83	.054	120	-.078	158	-.063
10	-.019	47	-.115	84	-.047	121	-.069	159	.018
11	-.035	48	-.095	85	.016	122	.004	160	-.068
12	-.036	49	-.103	86	.031	123	-.107	161	-.067
13	-.036	50	-.021	87	-.045	124	-.088	162	-.065
14	-.007	51	-.117	88	-.103	125	-.095	163	.006
15	-.153	52	-.110	89	-.110	126	-.032	164	-.032
16	-.146	53	-.110	90	.175	127	-.088	165	-.010
17	-.152	54	-.037	91	.068	128	-.109	166	-.001
18	-.057	55	-.401	92	-.006	129	-.118	167	.074
19	-.162	56	-.335	93	-.073	130	-.030	168	-.073
20	-.135	57	-.193	94	-.057	131	-.135	169	-.011
21	-.152	58	-.062	95	-.132	132	-.012	170	.002
22	-.061	59	-.199	96	-.103	133	.007	171	.081
23	-.160	60	-.277	97	-.053	134	.033	172	.012
24	-.149	61	-.263	98	-.040	135	-.174	173	.003
25	-.150	62	.127	99	-.140	136	-.132	174	.003
26	.043	63	-.152	100	-.156	137	-.032	175	.080
27	.058	64	-.205	101	-.147	138	.091	176	.017
28	.007	65	-.141	102	-.050	139	.120	177	.028
29	-.042	66	-.070	103	-.137	140	-.073	178	.046
30	.033	67	-.170	104	-.105	141	-.074	179	.057
31	-.135	68	-.168	105	-.096	142	.004	180	-.016
32	-.096	69	-.290	106	-.015	144	-.067	181	-.008
33	-.127	70	.301	107	-.131	145	-.054	182	-.003
34	-.046	71	-.091	108	-.146	146	-.040	183	.073
35	-.156	72	-.136	109	-.133	147	.053	184	.042
36	-.137	73	-.149	110	-.037	148	-.022	185	.075
37	-.073	74	-.071	111	-.120	149	-.014	186	-.129

WIND DIRECTION   0   BREAKWATER   2 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.304	38	.052	75	.412	112	-.165	150	-.060
2	-.008	39	-.115	76	.312	113	-.148	151	.020
3	-.095	40	.074	77	.315	114	-.040	152	-.017
4	-.088	41	-.103	78	.153	115	-.095	153	.015
5	-.113	42	.111	79	.024	116	-.174	154	.071
6	-.150	43	-.142	80	-.034	117	-.175	155	.149
7	-.112	44	-.070	81	.092	118	-.085	156	.012
8	-.091	45	-.020	82	.218	119	-.169	157	-.124
9	-.106	46	.081	83	.084	120	-.159	158	-.153
10	-.035	47	-.177	84	-.049	121	-.145	159	-.082
11	-.164	48	-.155	85	-.009	122	-.037	160	-.170
12	-.125	49	-.174	86	.039	123	-.093	161	-.147
13	-.079	50	-.067	87	-.017	124	-.179	162	-.159
14	-.029	51	-.140	88	-.172	125	-.190	163	-.083
15	-.171	52	-.117	89	-.169	126	-.095	164	-.118
16	-.160	53	-.097	90	.211	127	-.153	165	-.089
17	-.160	54	.027	91	.099	128	-.152	166	-.086
18	-.067	55	-.423	92	-.004	129	-.132	167	-.037
19	-.163	56	-.357	93	-.138	130	-.020	168	-.443
20	-.146	57	-.192	94	-.106	131	-.069	169	-.070
21	-.153	58	-.052	95	-.195	132	.011	170	-.056
22	-.056	59	-.165	96	-.166	133	-.030	171	.019
23	-.160	60	-.258	97	-.207	134	-.193	172	-.071
24	-.148	61	-.305	98	-.109	135	-.231	173	-.226
25	-.148	62	.088	99	-.211	136	-.169	174	-.047
26	.122	63	-.212	100	-.188	137	-.100	175	.025
27	.072	64	-.202	101	-.187	138	-.092	176	-.053
28	.007	65	-.154	102	-.096	139	.016	177	-.045
29	-.050	66	-.051	103	-.183	140	-.060	178	-.064
30	-.023	67	-.148	104	-.172	141	-.078	179	.002
31	-.222	68	-.144	105	-.157	142	-.003	180	-.082
32	-.131	69	-.297	106	-.049	144	-.037	181	-.055
33	-.149	70	.269	107	-.112	145	-.080	182	-.047
34	-.045	71	-.110	108	-.179	146	-.074	183	-.033
35	-.145	72	-.149	109	-.182	147	-.014	184	-0.000
36	-.097	73	-.137	110	-.093	148	-.155	185	-.002
37	-.147	74	-.040	111	-.178	149	-.150	186	-.202

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   0   BREAKWATER   2 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.061	38	.115	75	.300	112	-.051	150	-.027
2	.042	39	-.019	76	.189	113	-.047	151	.043
3	-.067	40	.169	77	.066	114	.038	152	-.001
4	-.044	41	-.025	78	.238	115	-.063	153	.020
5	-.059	42	.136	79	.009	116	-.096	154	.005
6	.030	43	-.096	80	-.049	117	-.085	155	.061
7	-.046	44	-.038	81	.064	118	.017	156	-.018
8	-.028	45	-.015	82	.146	119	-.054	157	.002
9	-.051	46	.063	83	.071	120	-.038	158	-.030
10	.003	47	-.105	84	-.081	121	-.035	159	.047
11	-.033	48	-.072	85	.017	122	.046	160	-.027
12	-.020	49	-.045	86	.042	123	-.049	161	-.030
13	-.010	50	-.001	87	-.011	124	-.066	162	-.028
14	.011	51	-.102	88	-.046	125	-.084	163	.050
15	-.139	52	-.076	89	-.105	126	-.005	164	-.008
16	-.082	53	-.082	90	.196	127	-.057	165	.012
17	-.099	54	-.017	91	.105	128	-.073	166	.019
18	-.020	55	-.385	92	-.024	129	-.083	167	.091
19	-.135	56	-.314	93	-.091	130	.006	168	-.053
20	-.094	57	-.174	94	-.048	131	-.086	169	.017
21	-.111	58	-.044	95	-.109	132	.014	170	.025
22	-.029	59	-.196	96	-.083	133	.014	171	.099
23	-.143	60	-.227	97	-.073	134	.058	172	.031
24	-.114	61	-.246	98	-.025	135	-.143	173	.036
25	-.115	62	.140	99	-.107	136	-.116	174	.029
26	.123	63	-.123	100	-.120	137	-.016	175	.102
27	.075	64	-.178	101	-.108	138	.100	176	.038
28	.011	65	-.105	102	-.007	139	.142	177	.055
29	-.062	66	-.042	103	-.033	140	-.039	178	.081
30	.025	67	-.159	104	-.064	141	-.037	179	.079
31	-.140	68	-.130	105	-.059	142	.031	180	.006
32	-.085	69	-.251	106	.026	144	-.021	181	.018
33	-.112	70	.348	107	-.074	145	-.001	182	.024
34	-.036	71	-.039	108	-.110	146	-.003	183	.059
35	-.148	72	-.092	109	-.095	147	.062	184	.059
36	-.106	73	-.113	110	.003	148	-.020	185	.119
37	-.064	74	-.032	111	-.068	149	-.002	186	-.095

WIND DIRECTION   0   BREAKWATER   3 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.574	38	-.157	75	.603	112	-.118	150	-.043
2	-.138	39	-.407	76	.655	113	-.103	151	.019
3	-.120	40	-.192	77	.601	114	-.082	152	-.022
4	-.104	41	-.421	78	.333	115	-.061	153	.019
5	-.120	42	-.040	79	.300	116	-.155	154	.082
6	-.501	43	-.403	80	.258	117	-.168	155	.164
7	-.210	44	-.170	81	.261	118	-.055	156	.030
8	-.120	45	.292	82	.428	119	-.125	157	-.111
9	-.123	46	.335	83	.336	120	-.099	158	-.155
10	-.045	47	-.180	84	.206	121	-.085	159	-.088
11	-.205	48	-.088	85	.246	122	.011	160	-.180
12	-.239	49	-.151	86	.367	123	-.060	161	-.149
13	-.167	50	-.058	87	.293	124	-.191	162	-.163
14	-.061	51	-.122	88	.048	125	-.184	163	-.090
15	-.159	52	-.101	89	.046	126	-.114	164	-.127
16	-.171	53	-.077	90	.465	127	-.080	165	-.094
17	-.159	54	.032	91	.395	128	-.126	166	-.108
18	-.077	55	-.495	92	.268	129	-.122	167	-.173
19	-.167	56	-.285	93	.272	130	-.005	168	-.585
20	-.158	57	-.195	94	.118	131	-.062	169	-.075
21	-.159	58	-.064	95	.033	132	.127	170	-.061
22	-.064	59	-.169	96	-.094	133	.107	171	-.006
23	-.163	60	-.344	97	.065	134	-.301	172	-.220
24	-.163	61	-.353	98	.067	135	-.408	173	-.526
25	-.152	62	.153	99	-.107	136	-.197	174	-.056
26	.303	63	-.219	100	-.200	137	-.088	175	.015
27	.339	64	-.176	101	-.195	138	-.201	176	-.068
28	.283	65	-.164	102	-.087	139	-.086	177	-.079
29	.188	66	-.063	103	-.163	140	-.059	178	-.379
30	.099	67	-.145	104	-.134	141	-.074	179	.001
31	-.406	68	-.160	105	-.114	142	.009	180	-.092
32	-.186	69	-.330	106	-.007	144	-.042	181	-.054
33	-.146	70	.232	107	-.069	145	-.080	182	-.056
34	-.141	71	-.174	108	-.199	146	-.074	183	.267
35	-.136	72	-.156	109	-.180	147	-.022	184	.260
36	-.101	73	-.144	110	-.073	148	-.175	185	-.039
37	-.343	74	-.044	111	-.145	149	-.141	186	-.191

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 0 BREAKWATER 3 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.094	38	.092	75	.313	112	-.095	150	-.071
2	.032	39	-.039	76	.210	113	-.088	151	-0.000
3	-.078	40	.126	77	.080	114	-.001	152	-.062
4	-.065	41	-.040	78	.250	115	-.111	153	-.040
5	-.088	42	.120	79	.009	116	-.147	154	-.033
6	.019	43	-.103	80	-.051	117	-.142	155	.044
7	-.051	44	-.069	81	.091	118	-.034	156	-.040
8	-.044	45	-.012	82	.163	119	-.102	157	-.027
9	-.071	46	.060	83	.074	120	-.077	158	-.067
10	-.022	47	-.136	84	-.076	121	-.070	159	.016
11	-.042	48	-.090	85	.022	122	.010	160	-.066
12	-.031	49	-.107	86	.048	123	-.093	161	-.070
13	-.031	50	-.032	87	-.026	124	-.094	162	-.066
14	-.010	51	-.126	88	-.097	125	-.104	163	.011
15	-.165	52	-.109	89	-.110	126	-.036	164	-.027
16	-.134	53	-.110	90	.187	127	-.080	165	.001
17	-.143	54	-.044	91	.092	128	-.114	166	.009
18	-.061	55	-.424	92	-.006	129	-.122	167	.082
19	-.174	56	-.345	93	-.074	130	-.028	168	-.064
20	-.136	57	-.195	94	-.052	131	-.126	169	-.002
21	-.148	58	-.053	95	-.120	132	-.006	170	.013
22	-.064	59	-.216	96	-.100	133	.005	171	.089
23	-.174	60	-.205	97	-.043	134	.039	172	.019
24	-.149	61	-.269	98	-.032	135	-.166	173	.018
25	-.147	62	.112	99	-.128	136	-.135	174	.014
26	.097	63	-.157	100	-.108	137	-.038	175	.089
27	.053	64	-.205	101	-.159	138	.087	176	.023
28	.014	65	-.136	102	-.055	139	.120	177	.038
29	-.028	66	-.072	103	-.133	140	-.078	178	.061
30	.032	67	-.183	104	-.109	141	-.078	179	.061
31	-.157	68	-.166	105	-.101	142	-.004	180	-.013
32	-.066	69	-.293	106	-.012	144	-.074	181	.001
33	-.129	70	.318	107	-.119	145	-.055	182	.011
34	-.054	71	-.074	108	-.157	146	-.041	183	.071
35	-.172	72	-.133	109	-.148	147	.044	184	.054
36	-.138	73	-.146	110	-.043	148	-.036	185	.083
37	-.073	74	-.063	111	-.117	149	-.025	186	-.135

WIND DIRECTION 0 BREAKWATER 4 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.303	38	.002	75	.243	112	-.101	150	.007
2	-.043	39	-.259	76	.307	113	-.070	151	.052
3	-.114	40	.036	77	.321	114	.036	152	-.026
4	-.102	41	-.232	78	-.022	115	-.029	153	.006
5	-.111	42	.154	79	-.077	116	-.229	154	.042
6	-.183	43	-.259	80	-.051	117	-.181	155	.112
7	-.128	44	-.056	81	.020	118	-.047	156	-.014
8	-.105	45	.260	82	.189	119	-.102	157	-.101
9	-.112	46	.310	83	.113	120	-.059	158	-.118
10	-.029	47	-.136	84	-.039	121	-.036	159	-.057
11	-.128	48	-.101	85	.036	122	.058	160	-.153
12	-.149	49	-.160	86	.299	123	-.012	161	-.114
13	-.094	50	-.031	87	.223	124	-.150	162	-.131
14	-.035	51	-.101	88	-.149	125	-.169	163	-.059
15	-.158	52	-.070	89	-.125	126	-.082	164	-.129
16	-.149	53	-.051	90	.422	127	-.078	165	-.112
17	-.140	54	.057	91	.383	128	-.092	166	-.127
18	-.058	55	-.476	92	.297	129	-.081	167	-.096
19	-.149	56	-.349	93	.148	130	.026	168	-.361
20	-.132	57	-.166	94	-.016	131	-.034	169	-.070
21	-.137	58	-.026	95	-.086	132	.166	170	-.081
22	-.039	59	-.132	96	-.190	133	.106	171	-.031
23	-.146	60	-.260	97	-.110	134	-.160	172	-.160
24	-.135	61	-.358	98	-.073	135	-.350	173	-.239
25	-.129	62	.152	99	-.219	136	-.163	174	-.053
26	.313	63	-.222	100	-.286	137	-.049	175	.001
27	.331	64	-.170	101	-.243	138	-.143	176	-.109
28	.300	65	-.124	102	-.112	139	.003	177	-.116
29	.169	66	-.023	103	-.178	140	-.008	178	-.167
30	.097	67	-.116	104	-.127	141	-.030	179	.013
31	-.337	68	-.114	105	-.088	142	.053	180	-.081
32	-.125	69	-.352	106	.022	144	-.041	181	-.043
33	-.118	70	.363	107	-.043	145	-.052	182	-.042
34	-.012	71	-.137	108	-.254	146	-.057	183	.232
35	-.112	72	-.109	109	-.211	147	.002	184	.185
36	-.077	73	-.102	110	-.090	148	-.107	185	.053
37	-.253	74	-.011	111	-.148	149	-.114	186	-.172

TABLE 2   (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   0   BREAKWATER   4 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.073	38	.096	75	.141	112	-.037	150	.019
2	.039	39	-.044	76	.120	113	-.029	151	.081
3	-.065	40	.111	77	.017	114	.051	152	.006
4	-.042	41	-.040	78	.117	115	-.046	153	.018
5	-.059	42	.108	79	-.042	116	-.028	154	.017
6	.019	43	-.048	80	-.056	117	-.024	155	.078
7	-.049	44	-.025	81	.021	118	.050	156	-.012
8	-.028	45	-.025	82	.106	119	-.038	157	-.003
9	-.047	46	.044	83	.003	120	-.022	158	-.027
10	.010	47	-.097	84	-.064	121	-.019	159	.045
11	-.064	48	-.042	85	-.012	122	.055	160	-.035
12	-.037	49	-.059	86	.050	123	-.036	161	-.021
13	-.021	50	.011	87	-.035	124	-.041	162	-.024
14	.013	51	-.091	88	-.061	125	-.035	163	.048
15	-.120	52	-.064	89	-.045	126	.022	164	-.004
16	-.089	53	-.062	90	.160	127	-.026	165	.019
17	-.089	54	.011	91	.052	128	-.059	166	.021
18	-.016	55	-.333	92	.015	129	-.067	167	.089
19	-.120	56	-.249	93	-.029	130	.025	168	-.038
20	-.082	57	-.125	94	.015	131	-.061	169	.022
21	-.097	58	-.015	95	-.055	132	.001	170	.030
22	-.016	59	-.149	96	-.030	133	.018	171	.100
23	-.128	60	-.201	97	.012	134	.028	172	.025
24	-.098	61	-.202	98	.014	135	-.094	173	.027
25	-.093	62	.127	99	-.050	136	-.067	174	.037
26	.088	63	-.121	100	-.072	137	.016	175	.106
27	.025	64	-.126	101	-.055	138	.092	176	.037
28	.005	65	-.067	102	.028	139	.122	177	.051
29	-.033	66	-.015	103	-.043	140	.013	178	.055
30	.041	67	-.127	104	-.046	141	.016	179	.082
31	-.104	68	-.115	105	-.044	142	.086	180	.009
32	-.058	69	-.269	106	.035	144	.012	181	.023
33	-.046	70	.272	107	-.056	145	.018	182	.034
34	-.011	71	-.051	108	-.053	146	.014	183	.087
35	-.121	72	-.080	109	-.049	147	.074	184	.025
36	-.076	73	-.080	110	.030	148	-.017	185	.097
37	-.060	74	-.006	111	-.055	149	-.006	186	-.061

WIND DIRECTION   45   BREAKWATER   0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.538	38	-.100	75	.077	112	.203	150	-.322
2	-.287	39	-.564	76	.190	113	.152	151	-.238
3	-.349	40	-.163	77	.264	114	.161	152	-.336
4	-.324	41	-.267	78	.137	115	-.030	153	-.335
5	-.364	42	.181	79	.185	116	.399	154	-.331
6	-.544	43	-.219	80	.277	117	.338	155	-.235
7	-.465	44	-.150	81	.009	118	.334	156	-.325
8	-.439	45	.415	82	.204	119	.227	157	-.293
9	-.460	46	.168	83	.209	120	.185	158	-.425
10	-.335	47	.081	84	.342	121	.138	159	-.319
11	-.783	48	.035	85	.250	122	.135	160	-.399
12	-.861	49	-.143	86	.520	123	-.060	161	-.418
13	-.690	50	-.050	87	.170	124	.271	162	-.408
14	-.519	51	-.225	88	.366	125	.285	163	-.300
15	-.569	52	-.327	89	.360	126	.156	164	-.333
16	-.467	53	-.406	90	.353	127	-.066	165	-.318
17	-.450	54	-.316	91	.092	128	-.186	166	-.308
18	-.368	55	-.974	92	.266	129	-.276	167	-.207
19	-.460	56	-.796	93	.237	130	-.221	168	-.292
20	-.496	57	-.471	94	.249	131	-.344	169	-.318
21	-.434	58	-.476	95	.337	132	.539	170	-.317
22	-.400	59	-.957	96	.435	133	.165	171	-.219
23	-.437	60	-.693	97	.424	134	-.798	172	-.302
24	-.503	61	-.239	98	.377	135	.306	173	-.280
25	-.499	62	-.442	99	.450	136	.187	174	-.312
26	.373	63	-1.041	100	.348	137	-.156	175	-.216
27	.116	64	-.711	101	.269	138	-.234	176	-.303
28	.016	65	-.483	102	.295	139	.223	177	-.292
29	.090	66	-.434	103	.201	140	-.319	178	-.284
30	.133	67	-.786	104	.148	141	-.334	179	-.257
31	.095	68	-.192	105	.087	142	-.224	180	-.340
32	.082	69	.030	106	.133	144	-.332	181	-.339
33	-.081	70	.162	107	-.009	145	-.345	182	-.314
34	-.150	71	-.745	108	.428	146	-.357	183	.544
35	-.498	72	-.447	109	.346	147	-.260	184	.139
36	-.419	73	-.452	110	.345	148	-.357	185	-.260
37	-.838	74	-.350	111	.244	149	-.365	186	-.591

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 45   BREAKWATER 0 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.513	38	-.063	75	.035	112	.223	150	-.402
2	-.272	39	-.504	76	.158	113	.180	151	-.376
3	-.320	40	-.133	77	.226	114	.198	152	-.181
4	-.299	41	-.208	78	.100	115	.034	153	.010
5	-.336	42	.168	79	.145	116	.400	154	.031
6	-.538	43	-.172	80	.244	117	.331	155	.049
7	-.444	44	-.150	81	-.024	118	.322	156	-.131
8	-.414	45	.392	82	.162	119	.220	157	-.224
9	-.426	46	.166	83	.166	120	.200	158	-.530
10	-.290	47	.122	84	.315	121	.161	159	-.350
11	-.791	48	.016	85	.219	122	.167	160	-.415
12	-.833	49	-.106	86	.503	123	-.006	161	-.394
13	-.668	50	-.008	87	.142	124	.298	162	-.368
14	-.518	51	-.161	88	.337	125	.286	163	-.261
15	-.527	52	-.272	89	.308	126	.118	164	-.402
16	-.395	53	-.387	90	.349	127	-.098	165	-.379
17	-.306	54	-.369	91	.089	128	-.171	166	-.374
18	-.326	55	-.874	92	.266	129	-.256	167	-.275
19	-.224	56	-.663	93	.211	130	-.231	168	-.382
20	-.457	57	-.403	94	.224	131	-.399	169	-.403
21	-.149	58	-.443	95	.278	132	.530	170	-.386
22	-.301	59	-.889	96	.386	133	.172	171	-.281
23	-.344	60	-.599	97	.382	134	-.830	172	-.378
24	-.445	61	-.213	98	.325	135	.325	173	-.340
25	-.477	62	-.408	99	.396	136	.206	174	-.352
26	.384	63	-.948	100	.345	137	-.178	175	-.257
27	.152	64	-.596	101	.278	138	-.245	176	-.365
28	.049	65	-.439	102	.295	139	.218	177	-.339
29	.118	66	-.375	103	.201	140	-.515	178	-.333
30	.153	67	-.784	104	.158	141	-.545	179	-.319
31	.148	68	-.102	105	.103	142	-.456	180	-.438
32	.117	69	.033	106	.145	144	-.473	181	-.410
33	-.068	70	.123	107	.006	145	-.345	182	-.386
34	-.135	71	-.722	108	.448	146	-.199	183	.560
35	-.458	72	-.413	109	.351	147	-.045	184	.132
36	-.392	73	-.455	110	.341	148	-.164	185	-.280
37	-.780	74	-.404	111	.244	149	-.242	186	-.522

WIND DIRECTION 45   BREAKWATER 0 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.350	38	-.031	75	-.120	112	.162	150	-.156
2	-.192	39	-.401	76	-.037	113	.124	151	-.080
3	-.297	40	-.204	77	-.015	114	.157	152	-.167
4	-.298	41	-.187	78	-.121	115	-.011	153	-.178
5	-.282	42	.042	79	-.174	116	.336	154	-.190
6	-.279	43	-.309	80	-.142	117	.239	155	-.117
7	-.338	44	-.256	81	-.191	118	.262	156	-.196
8	-.349	45	.107	82	-.040	119	.152	157	-.199
9	-.373	46	.035	83	-.119	120	.140	158	-.249
10	-.229	47	-.035	84	-.139	121	.107	159	-.156
11	-.780	48	-.277	85	-.125	122	.129	160	-.226
12	-.637	49	-.184	86	.196	123	-.036	161	-.240
13	-.610	50	-.068	87	-.091	124	.283	162	-.233
14	-.539	51	-.221	88	-.125	125	.166	163	-.132
15	-.440	52	-.313	89	-.093	126	.007	164	-.259
16	-.307	53	-.361	90	.490	127	-.175	165	-.313
17	-.279	54	-.205	91	.197	128	-.191	166	-.362
18	-.227	55	-.815	92	.157	129	-.240	167	-.282
19	-.296	56	-.447	93	-.055	130	-.178	168	-.362
20	-.324	57	-.344	94	-.067	131	-.286	169	-.263
21	-.315	58	-.369	95	-.132	132	.594	170	-.319
22	-.232	59	-.818	96	.135	133	.278	171	-.272
23	-.323	60	-.550	97	.145	134	-.852	172	-.382
24	-.333	61	-.287	98	-.083	135	.323	173	-.363
25	-.356	62	-.430	99	.129	136	.142	174	-.193
26	.409	63	-.810	100	.226	137	-.154	175	-.179
27	.110	64	-.438	101	.177	138	-.053	176	-.331
28	.101	65	-.338	102	.233	139	.277	177	-.367
29	.011	66	-.257	103	.129	140	-.153	178	-.349
30	-.016	67	-.614	104	.101	141	-.160	179	-.072
31	.119	68	-.089	105	.059	142	-.072	180	-.194
32	-.006	69	.028	106	.123	144	-.169	181	-.105
33	-.141	70	.004	107	-.008	145	-.190	182	-.138
34	-.149	71	-.604	108	.377	146	-.204	183	.326
35	-.367	72	-.301	109	.280	147	-.129	184	.059
36	-.285	73	-.295	110	.290	148	-.222	185	-.217
37	-.483	74	-.241	111	.178	149	-.191	186	-.321

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 45   BREAKWATER 1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.411	38	-.006	75	.152	112	.097	150	-.377
2	-.130	39	-.512	76	.237	113	.082	151	-.039
3	-.237	40	-.069	77	.277	114	.119	152	.074
4	-.233	41	-.105	78	.132	115	-.051	153	.080
5	-.252	42	.205	79	.143	116	.079	154	.070
6	-.212	43	-.131	80	.192	117	.131	155	.100
7	-.329	44	-.085	81	.055	118	.181	156	-.064
8	-.304	45	.390	82	.236	119	.111	157	-.122
9	-.334	46	.252	83	.210	120	.111	158	-.371
10	-.211	47	.245	84	.232	121	.093	159	-.216
11	-.626	48	.245	85	.214	122	.123	160	-.285
12	-.644	49	.219	86	.467	123	-.039	161	-.270
13	-.556	50	.256	87	.207	124	.378	162	-.248
14	-.477	51	.128	88	.206	125	.314	163	-.144
15	-.445	52	.079	89	.157	126	.329	164	-.289
16	-.280	53	.029	90	.586	127	.243	165	-.273
17	-.235	54	-.030	91	.335	128	.193	166	-.277
18	-.235	55	-.797	92	.344	129	.135	167	-.192
19	-.181	56	-.568	93	.272	130	.186	168	-.280
20	-.351	57	-.337	94	.263	131	.037	169	-.244
21	-.133	58	-.368	95	.156	132	.660	170	-.272
22	-.230	59	-.508	96	-.025	133	.332	171	-.207
23	-.273	60	-.544	97	.188	134	-.693	172	-.314
24	-.355	61	-.147	98	.138	135	.309	173	-.257
25	-.404	62	-.345	99	.002	136	.198	174	-.186
26	.541	63	-.844	100	.315	137	-.042	175	-.153
27	.302	64	-.441	101	.237	138	-.175	176	-.299
28	.247	65	-.345	102	.233	139	.285	177	-.281
29	.257	66	-.287	103	.131	140	-.510	178	-.255
30	.191	67	-.641	104	.129	141	-.498	179	-.141
31	.049	68	-.102	105	.124	142	-.457	180	-.252
32	.109	69	.127	106	.192	144	-.357	181	-.217
33	.001	70	.121	107	.058	145	-.227	182	-.177
34	-.074	71	-.578	108	.096	146	-.150	183	.545
35	-.385	72	-.249	109	.072	147	-.022	184	.291
36	-.329	73	-.358	110	.146	148	-.135	185	-.244
37	-.633	74	-.288	111	.089	149	-.168	186	-.387

WIND DIRECTION 45   BREAKWATER 1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.311	38	.013	75	-.042	112	.022	150	-.110
2	-.156	39	-.357	76	.009	113	-.012	151	-.046
3	-.247	40	-.117	77	.041	114	.026	152	-.129
4	-.229	41	-.085	78	-.111	115	-.126	153	-.125
5	-.213	42	.174	79	-.155	116	.125	154	-.120
6	-.231	43	-.107	80	-.129	117	.102	155	-.040
7	-.294	44	-.034	81	-.153	118	.147	156	-.113
8	-.243	45	.346	82	-.001	119	.035	157	-.108
9	-.298	46	.176	83	-.083	120	.032	158	-.178
10	-.150	47	.162	84	-.122	121	.002	159	-.091
11	-.702	48	.147	85	-.064	122	.033	160	-.162
12	-.601	49	.112	86	.395	123	-.115	161	-.170
13	-.511	50	.149	87	.016	124	.305	162	-.161
14	-.449	51	.028	88	-.064	125	.251	163	-.071
15	-.376	52	-0.000	89	.021	126	.254	164	-.185
16	-.232	53	-.033	90	.666	127	.133	165	-.254
17	-.268	54	-.001	91	.299	128	.094	166	-.329
18	-.147	55	-.675	92	.299	129	.034	167	-.273
19	-.234	56	-.402	93	.162	130	.093	168	-.352
20	-.244	57	-.266	94	.084	131	-.036	169	-.193
21	-.235	58	-.261	95	.012	132	.685	170	-.272
22	-.156	59	-.637	96	.124	133	.492	171	-.253
23	-.256	60	-.387	97	.212	134	-.753	172	-.380
24	-.258	61	-.121	98	.084	135	.266	173	-.362
25	-.280	62	-.321	99	.082	136	.173	174	-.089
26	.573	63	-.732	100	.226	137	.001	175	-.082
27	.279	64	-.358	101	.162	138	-.096	176	-.268
28	.273	65	-.251	102	.175	139	.291	177	-.359
29	.186	66	-.182	103	.047	140	-.109	178	-.349
30	.175	67	-.495	104	.037	141	-.129	179	-.028
31	.113	68	-.080	105	.008	142	-.036	180	-.133
32	.090	69	.162	106	.061	144	-.129	181	-.054
33	.010	70	.076	107	-.068	145	-.135	182	-.057
34	-.016	71	-.561	108	.128	146	-.130	183	.523
35	-.274	72	-.236	109	.093	147	-.049	184	.169
36	-.202	73	-.229	110	.132	148	-.134	185	-.148
37	-.507	74	-.164	111	.023	149	-.116	186	-.261

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 45   BREAKWATER 2 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.306	38	.019	75	.130	112	-.094	150	-.203
2	-.063	39	-.152	76	.227	113	-.076	151	.033
3	-.181	40	-.077	77	.222	114	.008	152	-.006
4	-.141	41	-.074	78	.075	115	-.109	153	.047
5	-.172	42	.223	79	.065	116	-.273	154	.042
6	-.111	43	-.039	80	.071	117	-.222	155	.077
7	-.194	44	.081	81	.044	118	-.071	156	-.054
8	-.169	45	.335	82	.202	119	-.114	157	-.101
9	-.227	46	.168	83	.136	120	-.080	158	-.245
10	-.096	47	-.086	84	.018	121	-.065	159	-.114
11	-.424	48	.004	85	.050	122	.015	160	-.184
12	-.406	49	.043	86	.358	123	-.097	161	-.147
13	-.354	50	.141	87	-.015	124	.008	162	-.152
14	-.324	51	.046	88	-.065	125	.045	163	-.077
15	-.317	52	.036	89	-.068	126	.130	164	-.225
16	-.169	53	.013	90	.572	127	.055	165	-.220
17	-.166	54	.024	91	.245	128	.051	166	-.233
18	-.104	55	-.667	92	.226	129	.027	167	-.151
19	-.149	56	-.438	93	.030	130	.109	168	-.225
20	-.203	57	-.243	94	.021	131	.007	169	-.193
21	-.123	58	-.279	95	-.085	132	.544	170	-.215
22	-.101	59	-.671	96	-.264	133	.411	171	-.160
23	-.176	60	-.374	97	-.296	134	-.467	172	-.250
24	-.243	61	-.069	98	-.094	135	.145	173	-.216
25	-.290	62	-.243	99	-.306	136	.120	174	-.146
26	.506	63	-.702	100	-.321	137	-.053	175	-.114
27	.326	64	-.326	101	-.322	138	-.098	176	-.240
28	.176	65	-.266	102	-.184	139	.073	177	-.239
29	.150	66	-.146	103	-.213	140	-.227	178	-.210
30	.169	67	-.562	104	-.146	141	-.213	179	-.093
31	.112	68	-.141	105	-.086	142	-.173	180	-.176
32	.105	69	.189	106	.025	144	-.172	181	-.167
33	.049	70	.049	107	-.060	145	-.138	182	-.137
34	.022	71	-.452	108	-.317	146	-.114	183	.383
35	-.279	72	-.208	109	-.253	147	-.033	184	.038
36	-.198	73	-.294	110	-.100	148	-.140	185	-.160
37	-.465	74	-.224	111	-.135	149	-.157	186	-.268

WIND DIRECTION 45   BREAKWATER 2 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.218	38	.017	75	-.016	112	.003	150	-.140
2	-.100	39	-.230	76	.024	113	-.024	151	-.081
3	-.214	40	-.046	77	-.019	114	.022	152	-.160
4	-.181	41	-.055	78	-.048	115	-.118	153	-.142
5	-.180	42	.184	79	-.102	116	.018	154	-.110
6	-.157	43	-.073	80	-.110	117	.054	155	-.004
7	-.226	44	.006	81	-.117	118	.129	156	-.064
8	-.210	45	.316	82	.012	119	.035	157	-.044
9	-.250	46	.154	83	-.070	120	.021	158	-.140
10	-.130	47	.149	84	-.148	121	-.007	159	-.060
11	-.554	48	.198	85	-.105	122	.031	160	-.113
12	-.442	49	.186	86	.333	123	-.102	161	-.142
13	-.407	50	.205	87	-.011	124	.222	162	-.125
14	-.392	51	.064	88	-.110	125	.233	163	-.037
15	-.349	52	.039	89	-.039	126	.278	164	-.143
16	-.206	53	-.010	90	.536	127	.176	165	-.168
17	-.201	54	-.012	91	.233	128	.120	166	-.187
18	-.139	55	-.723	92	.221	129	.051	167	-.110
19	-.239	56	-.439	93	.127	130	.104	168	-.185
20	-.231	57	-.266	94	.081	131	-.020	169	-.142
21	-.221	58	-.298	95	-.011	132	.494	170	-.172
22	-.159	59	-.641	96	.013	133	.383	171	-.113
23	-.263	60	-.390	97	.083	134	-.461	172	-.200
24	-.240	61	-.079	98	.067	135	.254	173	-.180
25	-.255	62	-.302	99	.001	136	.198	174	-.103
26	.478	63	-.745	100	.073	137	.047	175	-.074
27	.233	64	-.362	101	.076	138	.023	176	-.187
28	.225	65	-.255	102	.127	139	.180	177	-.194
29	.171	66	-.194	103	.011	140	-.145	178	-.174
30	.200	67	-.520	104	-.021	141	-.173	179	.013
31	.159	68	-.046	105	-.039	142	-.078	180	-.097
32	.150	69	-.200	106	-.030	144	-.167	181	-.022
33	.060	70	.038	107	-.090	145	-.154	182	-.050
34	.020	71	-.444	108	-.007	146	-.127	183	.429
35	-.243	72	-.197	109	.029	147	-.019	184	.048
36	-.189	73	-.205	110	.110	148	-.081	185	-.108
37	-.418	74	-.134	111	.017	149	-.065	186	-.250

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   45   BREAKWATER   3 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.354	38	-.013	75	.145	112	.100	150	-.326
2	-.074	39	-.248	76	.236	113	.089	151	-.044
3	-.193	40	-.111	77	.260	114	.131	152	.072
4	-.189	41	-.107	78	.123	115	-.044	153	.055
5	-.214	42	.178	79	.116	116	-.128	154	.038
6	-.156	43	-.071	80	.154	117	-.036	155	.070
7	-.237	44	-.005	81	.057	118	.111	156	-.066
8	-.213	45	.347	82	.221	119	.069	157	-.125
9	-.277	46	.204	83	.157	120	.095	158	-.339
10	-.157	47	.034	84	.140	121	.082	159	-.199
11	-.512	48	.091	85	.125	122	.114	160	-.259
12	-.488	49	.126	86	.419	123	-.051	161	-.247
13	-.406	50	.212	87	.095	124	.201	162	-.226
14	-.376	51	.122	88	.055	125	.224	163	-.147
15	-.376	52	.093	89	.061	126	.299	164	-.239
16	-.248	53	.040	90	.568	127	.231	165	-.237
17	-.200	54	-0.000	91	.271	128	.198	166	-.245
18	-.179	55	-.728	92	.261	129	.138	167	-.166
19	-.149	56	-.498	93	.159	130	.181	168	-.239
20	-.283	57	-.302	94	.159	131	.030	169	-.225
21	-.127	58	-.339	95	.063	132	.606	170	-.231
22	-.171	59	-.746	96	-.130	133	.378	171	-.171
23	-.249	60	-.454	97	-.045	134	-.638	172	-.268
24	-.322	61	-.123	98	.048	135	.280	173	-.224
25	-.377	62	-.305	99	-.142	136	.224	174	-.173
26	.530	63	-.758	100	-.032	137	-.036	175	-.119
27	.312	64	-.401	101	.014	138	-.202	176	-.246
28	.190	65	-.331	102	.150	139	.156	177	-.243
29	.171	66	-.264	103	.146	140	-.486	178	-.218
30	.190	67	-.663	104	.176	141	-.438	179	-.153
31	.147	68	-.007	105	.159	142	-.415	180	-.249
32	.121	69	.150	106	.213	144	-.295	181	-.234
33	.025	70	.053	107	.055	145	-.194	182	-.200
34	-.059	71	-.555	108	-.146	146	-.137	183	.469
35	-.344	72	-.261	109	-.061	147	-.034	184	.185
36	-.303	73	-.364	110	.099	148	-.137	185	-.214
37	-.560	74	-.303	111	.072	149	-.178	186	-.353

WIND DIRECTION   45   BREAKWATER   3 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.301	38	-.012	75	-.071	112	.032	150	-.107
2	-.154	39	-.276	76	.004	113	.015	151	-.047
3	-.254	40	-.140	77	.030	114	.062	152	-.140
4	-.221	41	-.107	78	-.101	115	-.090	153	-.136
5	-.206	42	.120	79	-.144	116	.033	154	-.112
6	-.221	43	-.112	80	-.129	117	.045	155	-.015
7	-.277	44	-.062	81	-.153	118	.120	156	-.100
8	-.252	45	.293	82	.001	119	.033	157	-.106
9	-.274	46	.131	83	-.080	120	.037	158	-.157
10	-.145	47	.124	84	-.119	121	.016	159	-.075
11	-.694	48	.163	85	-.089	122	.055	160	-.153
12	-.550	49	.167	86	.359	123	-.092	161	-.153
13	-.435	50	.212	87	-.003	124	.195	162	-.144
14	-.391	51	.093	88	-.074	125	.182	163	-.058
15	-.342	52	.075	89	-.020	126	.229	164	-.183
16	-.219	53	.027	90	.650	127	.152	165	-.252
17	-.193	54	.023	91	.211	128	.125	166	-.332
18	-.147	55	-.677	92	.239	129	.074	167	-.279
19	-.243	56	-.345	93	.137	130	.131	168	-.366
20	-.233	57	-.257	94	.107	131	.003	169	-.190
21	-.232	58	-.240	95	.012	132	.674	170	-.270
22	-.151	59	-.656	96	.093	133	.448	171	-.260
23	-.264	60	-.406	97	.139	134	-.705	172	-.401
24	-.243	61	-.144	98	.086	135	.211	173	-.382
25	-.245	62	-.323	99	.054	136	.164	174	-.080
26	.561	63	-.698	100	.090	137	.033	175	-.067
27	.252	64	-.323	101	.074	138	-.134	176	-.264
28	.164	65	-.247	102	.149	139	.142	177	-.369
29	.146	66	-.172	103	.070	140	-.109	178	-.346
30	.153	67	-.512	104	.078	141	-.130	179	-.023
31	.115	68	.016	105	.065	142	-.034	180	-.132
32	.113	69	.138	106	.118	144	-.138	181	-.055
33	.027	70	.007	107	-.012	145	-.141	182	-.056
34	-.019	71	-.464	108	.022	146	-.128	183	.487
35	-.277	72	-.209	109	.027	147	-.034	184	.123
36	-.204	73	-.213	110	.107	148	-.123	185	-.132
37	-.525	74	-.139	111	.024	149	-.114	186	-.223

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 45   BREAKWATER 4 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.347	38	.017	75	.156	112	-.018	150	-.281
2	-.073	39	-.246	76	.254	113	-.016	151	.012
3	-.189	40	-.075	77	.260	114	.042	152	.006
4	-.180	41	-.104	78	.130	115	-.107	153	.067
5	-.204	42	.239	79	.125	116	-.276	154	.071
6	-.122	43	-.060	80	.144	117	-.165	155	.096
7	-.236	44	.030	81	.099	118	-.002	156	-.046
8	-.209	45	.471	82	.273	119	-.041	157	-.101
9	-.275	46	.256	83	.206	120	-.002	158	-.295
10	-.143	47	.028	84	.112	121	-.002	159	-.168
11	-.528	48	.111	85	.135	122	.051	160	-.244
12	-.523	49	.145	86	.477	123	-.092	161	-.203
13	-.422	50	.219	87	.047	124	.143	162	-.201
14	-.351	51	.115	88	.005	125	.180	163	-.124
15	-.379	52	.087	89	.012	126	.257	164	-.257
16	-.231	53	.042	90	.651	127	.185	165	-.236
17	-.198	54	.024	91	.277	128	.165	166	-.233
18	-.154	55	-.727	92	.282	129	.111	167	-.158
19	-.159	56	-.498	93	.143	130	.162	168	-.235
20	-.260	57	-.280	94	.105	131	.018	169	-.232
21	-.141	58	-.313	95	.008	132	.667	170	-.229
22	-.146	59	-.738	96	-.244	133	.476	171	-.171
23	-.241	60	-.462	97	-.200	134	-.652	172	-.269
24	-.300	61	-.102	98	-.044	135	.244	173	-.220
25	-.353	62	-.303	99	-.267	136	.209	174	-.173
26	.643	63	-.772	100	-.275	137	-.006	175	-.118
27	.416	64	-.378	101	-.240	138	-.252	176	-.250
28	.234	65	-.287	102	-.087	139	.107	177	-.241
29	.232	66	-.232	103	-.109	140	-.337	178	-.211
30	.240	67	-.016	104	-.047	141	-.320	179	-.159
31	.164	68	-.108	105	-.026	142	-.296	180	-.259
32	.159	69	.187	106	.061	144	-.246	181	-.240
33	.063	70	.041	107	-.068	145	-.191	182	-.201
34	.021	71	-.542	108	-.313	146	-.146	183	.528
35	-.315	72	-.253	109	-.204	147	-.057	184	.178
36	-.237	73	-.341	110	-.032	148	-.167	185	-.196
37	-.656	74	-.287	111	-.064	149	-.190	186	-.304

WIND DIRECTION 45   BREAKWATER 4 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.232	38	.004	75	-.032	112	.015	150	.064
2	-.108	39	-.223	76	.032	113	.003	151	.107
3	-.218	40	-.095	77	.034	114	.051	152	.040
4	-.186	41	-.063	78	-.057	115	-.091	153	.043
5	-.180	42	.174	79	-.127	116	.020	154	.053
6	-.168	43	-.072	80	-.119	117	.035	155	.123
7	-.231	44	.018	81	-.090	118	.108	156	.075
8	-.204	45	.353	82	.025	119	.020	157	.080
9	-.239	46	.159	83	-.066	120	.029	158	.024
10	-.119	47	.059	84	-.133	121	.015	159	.084
11	-.585	48	.096	85	-.092	122	.058	160	.034
12	-.462	49	.089	86	.394	123	-.077	161	.027
13	-.383	50	.133	87	.009	124	.171	162	.037
14	-.358	51	.009	88	-.098	125	.164	163	.098
15	-.325	52	-.005	89	-.041	126	.208	164	.003
16	-.194	53	-.042	90	.621	127	.106	165	-.023
17	-.186	54	-.023	91	.256	128	.081	166	-.054
18	-.124	55	-.660	92	.260	129	.027	167	.001
19	-.225	56	-.400	93	.180	130	.083	168	-.055
20	-.209	57	-.242	94	.122	131	-.042	169	.008
21	-.208	58	-.265	95	.006	132	.629	170	-.021
22	-.137	59	-.625	96	.056	133	.442	171	.018
23	-.242	60	-.346	97	.116	134	-.575	172	-.051
24	-.232	61	-.088	98	.092	135	.181	173	-.032
25	-.250	62	-.272	99	.021	136	.147	174	.049
26	.533	63	-.688	100	.007	137	.165	175	.058
27	.283	64	-.331	101	.013	138	.053	176	-.046
28	.205	65	-.229	102	.084	139	.295	177	-.063
29	.167	66	-.174	103	0.000	140	.050	178	-.050
30	.171	67	-.482	104	.011	141	.037	179	.134
31	.093	68	-.081	105	.003	142	.108	180	.047
32	.093	69	.149	106	.065	144	.033	181	.114
33	.021	70	.045	107	-.057	145	.033	182	.087
34	-.013	71	-.467	108	-.017	146	.040	183	.572
35	-.271	72	-.210	109	.003	147	.110	184	.269
36	-.191	73	-.227	110	.045	148	.061	185	.054
37	-.490	74	-.161	111	.005	149	.072	186	-.042

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 90   BREAKWATER 0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.159	38	-.126	75	-.154	112	.462	150	-.478
2	-.090	39	-.301	76	-.193	113	.458	151	-.362
3	-.198	40	-.442	77	-.332	114	.488	152	-.384
4	-.185	41	-.447	78	-.057	115	.377	153	-.235
5	-.169	42	-.405	79	-.178	116	.301	154	-.141
6	-.115	43	-.799	80	-.225	117	.381	155	-.020
7	-.242	44	-.428	81	-.125	118	.438	156	-.103
8	-.248	45	-.327	82	-.066	119	.388	157	-.113
9	-.201	46	-.230	83	-.174	120	.395	158	-.164
10	-.090	47	-.494	84	-.247	121	.393	159	-.035
11	-.437	48	-.416	85	-.205	122	.426	160	-.145
12	-.410	49	-.241	86	-.244	123	.296	161	-.159
13	-.404	50	-.155	87	-.323	124	-.346	162	-.117
14	-.190	51	-.318	88	-.281	125	-.252	163	-.056
15	-.264	52	-.422	89	-.319	126	-.029	164	-.166
16	-.185	53	-.507	90	.125	127	-.104	165	-.155
17	-.176	54	-.424	91	-.419	128	-.122	166	-.139
18	-.084	55	-.884	92	-.327	129	-.232	167	-.059
19	-.199	56	-.315	93	-.430	130	-.250	168	-.152
20	-.233	57	-.403	94	-.270	131	-.396	169	-.175
21	-.218	58	-.734	95	-.380	132	.152	170	-.167
22	-.230	59	-.790	96	-.445	133	.008	171	-.062
23	-.295	60	-.445	97	-.475	134	-.499	172	-.152
24	-.346	61	-.936	98	-.348	135	.358	173	-.143
25	-.508	62	-.510	99	-.458	136	.392	174	-.188
26	.040	63	-.439	100	.369	137	.261	175	-.086
27	-.304	64	-.321	101	.366	138	.104	176	-.145
28	-.371	65	-.359	102	.430	139	.032	177	-.139
29	-.329	66	-.744	103	.404	140	-.505	178	-.148
30	-.178	67	-.647	104	.409	141	-.477	179	-.093
31	.140	68	.477	105	.344	142	-.380	180	-.215
32	.239	69	-.708	106	.435	144	-.422	181	-.172
33	.149	70	-.339	107	.378	145	-.277	182	-.187
34	.142	71	-.344	108	.391	146	-.195	183	-.238
35	-.340	72	-.322	109	.451	147	-.062	184	-.295
36	-.421	73	-.614	110	.468	148	-.138	185	-.284
37	-.154	74	-.615	111	.454	149	-.138	186	-.279

WIND DIRECTION 90   BREAKWATER 0 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.161	38	-.143	75	-.208	112	.432	150	-.686
2	-.091	39	-.287	76	-.233	113	.432	151	-.303
3	-.183	40	-.435	77	-.341	114	.440	152	-.300
4	-.170	41	-.451	78	-.110	115	.417	153	-.242
5	-.160	42	-.419	79	-.236	116	.291	154	-.236
6	-.119	43	-.772	80	-.270	117	.365	155	-.137
7	-.234	44	-.815	81	-.182	118	.412	156	-.229
8	-.233	45	-.329	82	-.126	119	.357	157	-.189
9	-.200	46	-.236	83	-.236	120	.383	158	-.132
10	-.090	47	-.476	84	-.292	121	.391	159	-.058
11	-.395	48	-.411	85	-.245	122	.435	160	-.187
12	-.405	49	-.303	86	-.292	123	.330	161	-.142
13	-.389	50	-.189	87	-.373	124	-.395	162	-.145
14	-.186	51	-.318	88	-.314	125	-.294	163	-.097
15	-.240	52	-.430	89	-.353	126	-.093	164	-.199
16	-.199	53	-.522	90	.066	127	-.177	165	-.176
17	-.190	54	-.437	91	-.480	128	-.168	166	-.171
18	-.099	55	-.848	92	-.392	129	-.261	167	-.103
19	-.207	56	-.304	93	-.466	130	-.300	168	-.205
20	-.198	57	-.409	94	-.312	131	-.466	169	-.196
21	-.233	58	-.750	95	-.428	132	.107	170	-.180
22	-.212	59	-.735	96	-.469	133	-.029	171	-.095
23	-.300	60	-.439	97	-.514	134	-.521	172	-.212
24	-.369	61	-.928	98	-.384	135	.309	173	-.185
25	-.443	62	-.484	99	-.507	136	.366	174	-.197
26	.040	63	-.421	100	.353	137	.260	175	-.096
27	-.286	64	-.305	101	.344	138	.092	176	-.190
28	-.387	65	-.358	102	.397	139	-.021	177	-.186
29	-.344	66	-.762	103	.357	140	-.597	178	-.182
30	-.189	67	-.473	104	.368	141	-.362	179	-.115
31	.160	68	.478	105	.343	142	-.423	180	-.253
32	.224	69	-.756	106	.389	144	-.309	181	-.192
33	.142	70	-.433	107	.349	145	-.220	182	-.211
34	.142	71	-.343	108	.390	146	-.227	183	-.286
35	-.304	72	-.370	109	.428	147	-.133	184	-.351
36	-.350	73	-.721	110	.460	148	-.227	185	-.311
37	-.144	74	-.563	111	.407	149	-.192	186	-.292

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   90   BREAKWATER   0   BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.183	38	-.122	75	-.197	112	.439	150	-.387
2	-.099	39	-.291	76	-.230	113	.432	151	-.314
3	-.198	40	-.423	77	-.415	114	.450	152	-.344
4	-.146	41	-.424	78	-.073	115	.313	153	-.209
5	-.175	42	-.393	79	-.234	116	.375	154	-.116
6	-.147	43	-.747	80	-.280	117	.442	155	-.005
7	-.249	44	-.791	81	-.170	118	.464	156	-.079
8	-.251	45	-.272	82	-.120	119	.381	157	-.097
9	-.211	46	-.209	83	-.247	120	.388	158	-.176
10	-.092	47	-.491	84	-.293	121	.369	159	-.034
11	-.402	48	-.443	85	-.247	122	.381	160	-.123
12	-.433	49	-.334	86	-.141	123	.213	161	-.174
13	-.414	50	-.210	87	-.317	124	-.459	162	-.098
14	-.192	51	-.342	88	-.232	125	-.339	163	-.031
15	-.243	52	-.446	89	-.256	126	-.111	164	-.147
16	-.174	53	-.537	90	.117	127	-.212	165	-.149
17	-.177	54	-.449	91	-.339	128	-.229	166	-.143
18	-.083	55	-.849	92	-.319	129	-.344	167	-.046
19	-.186	56	-.299	93	-.346	130	-.353	168	-.117
20	-.214	57	-.390	94	-.268	131	-.500	169	-.157
21	-.213	58	-.717	95	-.360	132	.127	170	-.154
22	-.200	59	-.766	96	-.646	133	-.006	171	-.071
23	-.274	60	-.443	97	-.575	134	-.681	172	-.127
24	-.349	61	-.510	98	-.277	135	.364	173	-.116
25	-.466	62	-.513	99	-.477	136	.381	174	-.157
26	.008	63	-.414	100	.410	137	.237	175	-.074
27	-.284	64	-.306	101	.367	138	.128	176	-.140
28	-.297	65	-.349	102	.417	139	.027	177	-.119
29	-.311	66	-.733	103	.355	140	-.411	178	-.113
30	-.171	67	-.603	104	.360	141	-.420	179	-.079
31	.152	68	.472	105	.340	142	-.306	180	-.170
32	.214	69	-.644	106	.344	144	-.366	181	-.158
33	.175	70	-.445	107	.290	145	-.238	182	-.163
34	.141	71	-.346	108	.499	146	-.167	183	-.090
35	-.364	72	-.334	109	.501	147	-.045	184	-.221
36	-.400	73	-.524	110	.512	148	-.115	185	-.248
37	-.188	74	-.641	111	.431	149	-.122	186	-.248

WIND DIRECTION   90   BREAKWATER   1   BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.168	38	.014	75	-.168	112	.026	150	-.169
2	-.100	39	-.151	76	-.207	113	.023	151	-.042
3	-.185	40	-.322	77	-.372	114	.094	152	-.137
4	-.147	41	-.265	78	-.061	115	.004	153	-.116
5	-.142	42	-.280	79	-.181	116	-.140	154	-.131
6	-.119	43	-.520	80	-.229	117	-.042	155	-.061
7	-.246	44	-.439	81	-.139	118	.089	156	-.174
8	-.220	45	-.206	82	-.063	119	.037	157	-.155
9	-.159	46	-.130	83	-.168	120	.046	158	-.134
10	-.051	47	.058	84	-.243	121	.042	159	-.040
11	-.430	48	.192	85	-.176	122	.099	160	-.171
12	-.461	49	.256	86	-.142	123	-.018	161	-.126
13	-.419	50	.337	87	-.225	124	.193	162	-.115
14	-.127	51	.260	88	-.178	125	.282	163	-.071
15	-.159	52	.238	89	-.175	126	.403	164	-.181
16	-.173	53	.182	90	.195	127	.346	165	-.155
17	-.177	54	.171	91	-.284	128	.330	166	-.174
18	-.070	55	-.754	92	-.275	129	.298	167	-.105
19	-.186	56	-.243	93	-.317	130	.310	168	-.202
20	-.168	57	-.343	94	-.153	131	.233	169	-.172
21	-.192	58	-.633	95	-.194	132	.204	170	-.160
22	-.146	59	-.532	96	-.267	133	.139	171	-.099
23	-.236	60	-.202	97	-.467	134	-.505	172	-.222
24	-.280	61	-.691	98	-.177	135	.346	173	-.182
25	-.324	62	-.446	99	-.278	136	.378	174	-.181
26	.117	63	-.356	100	.062	137	.282	175	-.074
27	-.132	64	-.222	101	.062	138	.215	176	-.186
28	-.263	65	-.257	102	.155	139	.153	177	-.190
29	-.240	66	-.613	103	.091	140	-.291	178	-.180
30	-.067	67	-.373	104	.068	141	-.182	179	-.105
31	.161	68	.426	105	.081	142	-.089	180	-.239
32	.236	69	-.554	106	.175	144	-.168	181	-.182
33	.214	70	-.327	107	.180	145	-.131	182	-.191
34	.187	71	-.243	108	-.145	146	-.151	183	-.158
35	-.173	72	-.252	109	-.052	147	-.075	184	-.238
36	-.213	73	-.525	110	.077	148	-.186	185	-.211
37	0.000	74	-.353	111	.019	149	-.165	186	-.211

TABLE 2   (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   90   BREAKWATER   1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.140	38	.012	75	-.166	112	.034	150	-.179
2	-.073	39	-.166	76	-.165	113	-.018	151	-.062
3	-.183	40	-.317	77	-.385	114	-.008	152	-.107
4	-.155	41	-.253	78	-.042	115	-.196	153	-.085
5	-.144	42	-.270	79	-.191	116	.032	154	-.079
6	-.123	43	-.532	80	-.219	117	.092	155	.004
7	-.234	44	-.462	81	-.128	118	.166	156	-.075
8	-.214	45	-.159	82	-.065	119	.061	157	-.089
9	-.158	46	-.099	83	-.183	120	.053	158	-.108
10	-.041	47	.146	84	-.232	121	-.002	159	-.001
11	-.453	48	.265	85	-.154	122	-.003	160	-.104
12	-.422	49	.305	86	-.041	123	-.193	161	-.091
13	-.408	50	.364	87	-.206	124	.295	162	-.069
14	-.123	51	.266	88	-.115	125	.340	163	-.022
15	-.154	52	.215	89	-.100	126	.410	164	-.131
16	-.144	53	.141	90	.204	127	.315	165	-.140
17	-.165	54	.074	91	-.237	128	.321	166	-.134
18	-.058	55	-.751	92	-.217	129	.270	167	-.022
19	-.172	56	-.241	93	-.241	130	.255	168	-.081
20	-.157	57	-.352	94	-.117	131	.068	169	-.147
21	-.170	58	-.645	95	-.154	132	.241	170	-.147
22	-.146	59	-.547	96	-.202	133	.122	171	-.059
23	-.224	60	-.197	97	-.324	134	-.575	172	-.112
24	-.267	61	-.692	98	-.107	135	.337	173	-.081
25	-.341	62	-.455	99	-.149	136	.362	174	-.147
26	.079	63	-.355	100	.267	137	.294	175	-.064
27	-.155	64	-.219	101	.266	138	.240	176	-.136
28	-.189	65	-.254	102	.318	139	.204	177	-.102
29	-.188	66	-.596	103	.102	140	-.352	178	-.077
30	-.008	67	-.438	104	.045	141	-.194	179	-.077
31	.143	68	.425	105	.039	142	-.108	180	-.156
32	.238	69	-.445	106	.051	144	-.146	181	-.152
33	.218	70	-.348	107	-.100	145	-.117	182	-.148
34	.177	71	-.310	108	.053	146	-.110	183	-.010
35	-.194	72	-.250	109	.092	147	-.017	184	-.106
36	-.224	73	-.459	110	.155	148	-.094	185	-.144
37	-.035	74	-.398	111	.043	149	-.108	186	-.163

WIND DIRECTION   90   BREAKWATER   2 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.140	38	.067	75	-.172	112	-.046	150	-.166
2	-.063	39	-.087	76	-.229	113	-.042	151	-.076
3	-.156	40	-.288	77	-.436	114	-.054	152	-.145
4	-.123	41	-.214	78	-.058	115	-.208	153	-.116
5	-.121	42	-.238	79	-.187	116	-.239	154	-.113
6	-.079	43	-.414	80	-.270	117	-.167	155	-.045
7	-.231	44	-.337	81	-.141	118	-.016	156	-.138
8	-.198	45	-.175	82	-.070	119	-.060	157	-.139
9	-.137	46	-.165	83	-.188	120	-.046	158	-.098
10	-.023	47	-.101	84	-.268	121	-.086	159	-.027
11	-.370	48	.066	85	-.217	122	-.056	160	-.145
12	-.477	49	.221	86	-.211	123	-.196	161	-.080
13	-.413	50	.340	87	-.294	124	-.022	162	-.088
14	-.091	51	.268	88	-.249	125	.120	163	-.063
15	-.136	52	.220	89	-.241	126	.329	164	-.166
16	-.141	53	.099	90	.267	127	.294	165	-.149
17	-.145	54	.052	91	-.274	128	.304	166	-.139
18	-.028	55	-.703	92	-.286	129	.245	167	-.077
19	-.147	56	-.219	93	-.325	130	.218	168	-.161
20	-.121	57	-.319	94	-.181	131	.025	169	-.177
21	-.145	58	-.573	95	-.267	132	.220	170	-.163
22	-.095	59	-.463	96	-.275	133	.242	171	-.069
23	-.183	60	-.117	97	-.308	134	-.502	172	-.168
24	-.228	61	-.633	98	-.204	135	.292	173	-.152
25	-.282	62	-.408	99	-.299	136	.367	174	-.187
26	.182	63	-.327	100	-.266	137	.285	175	-.082
27	-.034	64	-.186	101	-.223	138	.273	176	-.140
28	-.283	65	-.217	102	-.027	139	.183	177	-.150
29	-.259	66	-.525	103	-.040	140	-.226	178	-.148
30	-.028	67	-.382	104	-.046	141	-.188	179	-.106
31	.192	68	.434	105	-.050	142	-.117	180	-.220
32	.270	69	-.518	106	-.049	144	-.179	181	-.183
33	.251	70	-.313	107	-.217	145	-.150	182	-.186
34	.230	71	-.270	108	-.260	146	-.141	183	-.183
35	-.118	72	-.235	109	-.181	147	-.062	184	-.250
36	-.138	73	-.489	110	-.022	148	-.153	185	-.183
37	.090	74	-.362	111	-.058	149	-.150	186	-.174

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 90   BREAKWATER 2 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.131	38	.044	75	-.147	112	-.149	150	-.199
2	-.070	39	-.130	76	-.180	113	-.180	151	-.112
3	-.160	40	-.280	77	-.315	114	-.125	152	-.182
4	-.133	41	-.194	78	-.036	115	-.258	153	-.156
5	-.127	42	-.237	79	-.158	116	-.208	154	-.132
6	-.093	43	-.330	80	-.191	117	-.186	155	-.035
7	-.241	44	-.274	81	-.127	118	-.078	156	-.102
8	-.192	45	-.125	82	-.040	119	-.165	157	-.093
9	-.138	46	-.083	83	-.151	120	-.161	158	-.112
10	-.030	47	-.086	84	-.195	121	-.176	159	-.006
11	-.376	48	.034	85	-.154	122	-.121	160	-.104
12	-.420	49	.067	86	-.081	123	-.249	161	-.073
13	-.390	50	.145	87	-.193	124	-.068	162	-.055
14	-.104	51	.113	88	-.157	125	.024	163	-.017
15	-.151	52	.059	89	-.151	126	.156	164	-.122
16	-.150	53	-.049	90	.213	127	.107	165	-.120
17	-.153	54	-.071	91	-.202	128	.186	166	-.106
18	-.047	55	-.751	92	-.176	129	.118	167	-.003
19	-.182	56	-.237	93	-.218	130	.070	168	-.075
20	-.134	57	-.346	94	-.098	131	-.107	169	-.134
21	-.168	58	-.625	95	-.176	132	.155	170	-.125
22	-.119	59	-.457	96	-.142	133	.161	171	-.036
23	-.236	60	-.034	97	-.225	134	-.421	172	-.087
24	-.263	61	-.414	98	-.100	135	.082	173	-.069
25	-.348	62	-.431	99	-.213	136	.176	174	-.123
26	.112	63	-.358	100	-.254	137	.289	175	-.043
27	-.106	64	-.203	101	-.257	138	.280	176	-.110
28	-.170	65	-.234	102	-.159	139	.209	177	-.076
29	-.177	66	-.600	103	-.202	140	-.254	178	-.073
30	-.018	67	-.468	104	-.140	141	-.207	179	-.074
31	.064	68	.422	105	-.192	142	-.128	180	-.152
32	.181	69	-.420	106	-.151	144	-.196	181	-.148
33	.219	70	-.244	107	-.259	145	-.169	182	-.141
34	.158	71	-.258	108	-.234	146	-.150	183	-.015
35	-.222	72	-.241	109	-.216	147	-.051	184	-.103
36	-.230	73	-.476	110	-.046	148	-.122	185	-.127
37	.038	74	-.436	111	-.165	149	-.120	186	-.151

WIND DIRECTION 90   BREAKWATER 3 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.143	38	.024	75	-.162	112	.084	150	-.186
2	-.071	39	-.139	76	-.196	113	.070	151	-.047
3	-.161	40	-.321	77	-.365	114	.106	152	-.129
4	-.134	41	-.250	78	-.053	115	-.045	153	-.122
5	-.138	42	-.287	79	-.184	116	-.114	154	-.137
6	-.097	43	-.517	80	-.224	117	-.018	155	-.072
7	-.223	44	-.458	81	-.131	118	.109	156	-.171
8	-.202	45	-.183	82	-.061	119	.055	157	-.166
9	-.146	46	-.114	83	-.171	120	.081	158	-.114
10	-.039	47	.086	84	-.237	121	.062	159	-.036
11	-.402	48	.210	85	-.170	122	.100	160	-.160
12	-.425	49	.287	86	-.144	123	-.054	161	-.104
13	-.398	50	.380	87	-.232	124	.200	162	-.108
14	-.119	51	.329	88	-.167	125	.269	163	-.077
15	-.155	52	.282	89	-.175	126	.395	164	-.180
16	-.172	53	.175	90	.196	127	.356	165	-.165
17	-.172	54	.120	91	-.297	128	.407	166	-.147
18	-.060	55	-.751	92	-.271	129	.380	167	-.070
19	-.182	56	-.243	93	-.317	130	.337	168	-.164
20	-.154	57	-.343	94	-.154	131	.173	169	-.190
21	-.182	58	-.622	95	-.196	132	.198	170	-.172
22	-.135	59	-.554	96	-.259	133	.127	171	-.074
23	-.225	60	-.229	97	-.477	134	-.491	172	-.168
24	-.273	61	-.750	98	-.175	135	.319	173	-.151
25	-.311	62	-.446	99	-.286	136	.401	174	-.200
26	.122	63	-.365	100	.087	137	.322	175	-.093
27	-.122	64	-.221	101	.067	138	.213	176	-.158
28	-.245	65	-.258	102	.153	139	.196	177	-.146
29	-.220	66	-.606	103	.125	140	-.319	178	-.149
30	-.038	67	-.408	104	.232	141	-.175	179	-.110
31	.178	68	.493	105	.219	142	-.092	180	-.237
32	.253	69	-.607	106	.218	144	-.151	181	-.189
33	.241	70	-.346	107	.079	145	-.137	182	-.203
34	.172	71	-.309	108	-.124	146	-.151	183	-.149
35	-.201	72	-.267	109	-.045	147	-.080	184	-.215
36	-.195	73	-.555	110	.088	148	-.180	185	-.216
37	.011	74	-.374	111	.044	149	-.173	186	-.203

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION   90   BREAKWATER 3 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.149	38	-.001	75	-.170	112	.107	150	-.181
2	-.086	39	-.178	76	-.194	113	.076	151	-.038
3	-.200	40	-.332	77	-.351	114	.087	152	-.071
4	-.156	41	-.268	78	-.057	115	-.103	153	-.046
5	-.142	42	-.300	79	-.159	116	-.042	154	-.049
6	-.118	43	-.574	80	-.221	117	.033	155	.022
7	-.247	44	-.528	81	-.145	118	.151	156	-.069
8	-.213	45	-.169	82	-.075	119	.091	157	-.086
9	-.156	46	-.115	83	-.143	120	.105	158	-.105
10	-.048	47	.071	84	-.234	121	.076	159	.001
11	-.435	48	.227	85	-.172	122	.081	160	-.108
12	-.422	49	.311	86	-.091	123	-.108	161	-.081
13	-.399	50	.403	87	-.206	124	.138	162	-.062
14	-.125	51	.336	88	-.135	125	.256	163	-.024
15	-.175	52	.329	89	-.124	126	.415	164	-.139
16	-.159	53	.234	90	.208	127	.382	165	-.142
17	-.140	54	.160	91	-.258	128	.419	166	-.133
18	-.054	55	-.775	92	-.233	129	.370	167	-.026
19	-.176	56	-.244	93	-.244	130	.359	168	-.102
20	-.142	57	-.343	94	-.127	131	.191	169	-.142
21	-.165	58	-.626	95	-.152	132	.194	170	-.145
22	-.147	59	-.590	96	-.203	133	.144	171	-.063
23	-.232	60	-.249	97	-.309	134	-.545	172	-.121
24	-.246	61	-.702	98	-.104	135	.339	173	-.093
25	-.330	62	-.443	99	-.146	136	.414	174	-.143
26	.075	63	-.345	100	.064	137	.335	175	-.068
27	-.165	64	-.226	101	.109	138	.252	176	-.142
28	-.207	65	-.269	102	.231	139	.232	177	-.104
29	-.203	66	-.624	103	.215	140	-.436	178	-.089
30	-.057	67	-.439	104	.256	141	-.200	179	-.078
31	.120	68	.508	105	.197	142	-.103	180	-.163
32	.225	69	-.561	106	.214	144	-.132	181	-.153
33	.200	70	-.351	107	.053	145	-.100	182	-.145
34	.128	71	-.316	108	-.038	146	-.090	183	-.033
35	-.252	72	-.266	109	.022	147	-.005	184	-.128
36	-.245	73	-.500	110	.143	148	-.090	185	-.163
37	-.029	74	-.413	111	.092	149	-.103	186	-.164

WIND DIRECTION   90   BREAKWATER 4 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.134	38	.062	75	-.188	112	-.029	150	-.156
2	-.057	39	-.113	76	-.228	113	-.052	151	-.058
3	-.156	40	-.237	77	-.400	114	-.022	152	-.135
4	-.121	41	-.224	78	-.069	115	-.194	153	-.101
5	-.119	42	-.240	79	-.201	116	-.187	154	-.105
6	-.079	43	-.452	80	-.245	117	-.087	155	-.046
7	-.225	44	-.340	81	-.131	118	.049	156	-.152
8	-.192	45	-.186	82	-.064	119	-.015	157	-.147
9	-.134	46	-.144	83	-.169	120	.003	158	-.108
10	-.018	47	.011	84	-.259	121	-.029	159	-.033
11	-.404	48	.181	85	-.202	122	-.001	160	-.156
12	-.455	49	.257	86	-.200	123	-.161	161	-.091
13	-.404	50	.350	87	-.290	124	.133	162	-.092
14	-.091	51	.277	88	-.225	125	.245	163	-.070
15	-.137	52	.263	89	-.233	126	.370	164	-.179
16	-.153	53	.189	90	.245	127	.314	165	-.155
17	-.145	54	.138	91	-.323	128	.335	166	-.142
18	-.028	55	-.716	92	-.287	129	.303	167	-.080
19	-.158	56	-.222	93	-.344	130	.305	168	-.168
20	-.128	57	-.325	94	-.180	131	.134	169	-.179
21	-.151	58	-.594	95	-.267	132	.254	170	-.159
22	-.103	59	-.496	96	-.311	133	.202	171	-.072
23	-.198	60	-.136	97	-.433	134	-.504	172	-.179
24	-.244	61	-.650	98	-.213	135	.303	173	-.153
25	-.282	62	-.424	99	-.343	136	.367	174	-.191
26	.181	63	-.344	100	-.103	137	.298	175	-.083
27	-.079	64	-.194	101	-.040	138	.269	176	-.154
28	-.267	65	-.231	102	.057	139	.170	177	-.152
29	-.220	66	-.555	103	-.026	140	-.247	178	-.146
30	-.024	67	-.378	104	-.015	141	-.183	179	-.117
31	.192	68	.456	105	-.038	142	-.114	180	-.245
32	.277	69	-.533	106	.014	144	-.175	181	-.192
33	.263	70	-.325	107	-.143	145	-.139	182	-.199
34	.244	71	-.284	108	-.201	146	-.137	183	-.186
35	-.115	72	-.244	109	-.114	147	-.067	184	-.252
36	-.145	73	-.523	110	.023	148	-.170	185	-.187
37	.067	74	-.363	111	-.044	149	-.159	186	-.183

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION   90   BREAKWATER   4 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.133	38	.039	75	-.165	112	-.087	150	-.210
2	-.068	39	-.132	76	-.188	113	-.094	151	-.092
3	-.178	40	-.287	77	-.349	114	-.053	152	-.142
4	-.134	41	-.190	78	-.040	115	-.214	153	-.102
5	-.128	42	-.238	79	-.173	116	-.180	154	-.079
6	-.097	43	-.376	80	-.196	117	-.142	155	.012
7	-.240	44	-.306	81	-.130	118	-.019	156	-.064
8	-.194	45	-.129	82	-.057	119	-.098	157	-.069
9	-.141	46	-.069	83	-.162	120	-.066	158	-.116
10	-.031	47	-.059	84	-.204	121	-.062	159	-.006
11	-.387	48	.090	85	-.149	122	-.028	160	-.110
12	-.435	49	.161	86	-.041	123	-.193	161	-.090
13	-.392	50	.253	87	-.190	124	.036	162	-.061
14	-.110	51	.141	88	-.141	125	.135	163	-.018
15	-.142	52	.148	89	-.136	126	.276	164	-.130
16	-.145	53	.077	90	.244	127	.216	165	-.133
17	-.147	54	.017	91	-.213	128	.255	166	-.125
18	-.048	55	-.754	92	-.181	129	.219	167	-.016
19	-.172	56	-.237	93	-.216	130	.229	168	-.099
20	-.141	57	-.345	94	-.096	131	.074	169	-.145
21	-.160	58	-.636	95	-.161	132	.204	170	-.139
22	-.134	59	-.490	96	-.163	133	.209	171	-.055
23	-.228	60	-.110	97	-.226	134	-.502	172	-.108
24	-.255	61	-.606	98	-.049	135	.241	173	-.094
25	-.353	62	-.428	99	-.210	136	.293	174	-.139
26	.113	63	-.352	100	-.231	137	.303	175	-.061
27	-.102	64	-.210	101	-.130	138	.305	176	-.136
28	-.174	65	-.243	102	-.065	139	.232	177	-.089
29	-.140	66	-.547	103	-.134	140	-.344	178	-.091
30	-.071	67	-.435	104	-.048	141	-.219	179	-.083
31	.125	68	.346	105	-.046	142	-.148	180	-.167
32	.223	69	-.430	106	-.003	144	-.148	181	-.157
33	.213	70	-.310	107	-.112	145	-.146	182	-.144
34	.161	71	-.273	108	-.222	146	-.122	183	-.025
35	-.195	72	-.239	109	-.181	147	-.023	184	-.109
36	-.222	73	-.448	110	-.054	148	-.103	185	-.129
37	.042	74	-.413	111	-.117	149	-.108	186	-.154

WIND DIRECTION 135   BREAKWATER   0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.287	38	-.108	75	-.332	112	.241	150	.445
2	-.133	39	-.490	76	-.335	113	.287	151	.434
3	-.245	40	-.658	77	-.349	114	.390	152	.330
4	-.263	41	-.427	78	-.253	115	.410	153	.278
5	-.446	42	-.497	79	-.362	116	-.101	154	.218
6	-.162	43	-.603	80	-.373	117	.042	155	.238
7	-.218	44	-.491	81	-.268	118	.182	156	.094
8	-.215	45	-.487	82	-.212	119	.170	157	-.028
9	-.233	46	-.359	83	-.331	120	.230	158	.311
10	-.594	47	-.472	84	-.376	121	.275	159	.181
11	-.315	48	-.368	85	-.362	122	.378	160	.025
12	-.202	49	-.225	86	-.341	123	.378	161	.079
13	-.120	50	-.056	87	-.429	124	-.334	162	-.060
14	-.088	51	-.132	88	-.377	125	-.286	163	-.077
15	-.453	52	-.144	89	-.387	126	-.129	164	-.281
16	-.262	53	.010	90	-.370	127	-.257	165	-.285
17	-.174	54	.149	91	-.581	128	-.043	166	-.297
18	-.068	55	-.884	92	-.567	129	.140	167	-.201
19	-.171	56	-.649	93	-.425	130	.344	168	-.303
20	-.153	57	-.870	94	-.316	131	.250	169	-.278
21	-.145	58	-.474	95	-.410	132	-.421	170	-.293
22	.155	59	-.264	96	-.397	133	-.521	171	-.207
23	-.248	60	-.548	97	-.399	134	-.279	172	-.303
24	-.402	61	-.765	98	-.320	135	-.132	173	-.295
25	-.093	62	-.630	99	-.400	136	.011	174	-.280
26	-.333	63	-.469	100	-.043	137	.265	175	-.199
27	-.556	64	-.654	101	.019	138	.055	176	-.298
28	-.610	65	-.558	102	.141	139	-.065	177	-.291
29	-.638	66	-.019	103	.145	140	.440	178	-.294
30	-.359	67	.672	104	.203	141	.336	179	-.182
31	-.245	68	.117	105	.235	142	.511	180	-.292
32	-.043	69	-.593	106	.329	144	.379	181	-.271
33	.141	70	-.582	107	.320	145	.304	182	-.270
34	.241	71	-.411	108	-.055	146	.252	183	-.341
35	.163	72	-.041	109	.071	147	.281	184	-.416
36	-.009	73	-.226	110	.194	148	.162	185	-.305
37	-.305	74	.442	111	.180	149	.067	186	-.506

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 135   BREAKWATER 1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.159	38	-.083	75	-.163	112	-.023	150	.193
2	-.042	39	-.248	76	-.182	113	-.027	151	.101
3	-.165	40	-.409	77	-.143	114	.052	152	-.025
4	-.184	41	-.273	78	-.089	115	-.047	153	-.026
5	-.468	42	-.331	79	-.173	116	-.096	154	-.084
6	-.076	43	-.331	80	-.172	117	-.048	155	-.040
7	-.137	44	-.301	81	-.163	118	.053	156	-.193
8	-.132	45	-.243	82	-.080	119	-.021	157	-.252
9	-.171	46	-.140	83	-.164	120	-.014	158	.320
10	-.282	47	-.097	84	-.184	121	-.010	159	.214
11	-.219	48	-.033	85	-.158	122	.067	160	-.036
12	-.181	49	.011	86	-.129	123	-.026	161	.278
13	-.105	50	.112	87	-.203	124	-.019	162	.093
14	-.001	51	.059	88	-.174	125	.014	163	-.044
15	-.303	52	.088	89	-.172	126	.130	164	-.451
16	-.157	53	.068	90	-.145	127	.006	165	-.335
17	-.109	54	.184	91	-.249	128	.107	166	-.246
18	.091	55	-.708	92	-.289	129	.145	167	-.122
19	-.032	56	-.423	93	-.207	130	.221	168	-.210
20	.110	57	-.675	94	-.090	131	.174	169	-.470
21	.007	58	-.355	95	-.200	132	-.204	170	-.393
22	.172	59	-.054	96	-.186	133	-.266	171	-.223
23	-.049	60	-.285	97	-.187	134	-.170	172	-.285
24	-.083	61	-.541	98	-.108	135	-.008	173	-.222
25	-.020	62	-.395	99	-.188	136	.026	174	-.373
26	-.121	63	-.310	100	-.008	137	.234	175	-.180
27	-.289	64	-.441	101	.017	138	-.005	176	-.224
28	-.305	65	-.437	102	.087	139	-.121	177	-.156
29	-.330	66	-.124	103	-0.000	140	.206	178	-.138
30	-.145	67	.509	104	-.017	141	.044	179	-.519
31	-.078	68	.062	105	-.019	142	.181	180	-.591
32	-.012	69	-.440	106	.065	144	.085	181	-.598
33	.090	70	-.329	107	-.004	145	-.070	182	-.410
34	.203	71	-.259	108	-.040	146	-.169	183	-.145
35	.177	72	.006	109	-.040	147	-.149	184	-.217
36	.079	73	-.087	110	.052	148	-.311	185	-.212
37	-.194	74	.394	111	-.026	149	-.368	186	-.363

WIND DIRECTION 135   BREAKWATER 1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.157	38	-.071	75	-.162	112	.142	150	.142
2	-.054	39	-.351	76	-.225	113	.145	151	.291
3	-.174	40	-.495	77	-.311	114	.166	152	.275
4	-.208	41	-.309	78	-.133	115	.032	153	.282
5	-.431	42	-.378	79	-.295	116	-.092	154	.240
6	-.052	43	-.461	80	-.321	117	.012	155	.261
7	-.135	44	-.352	81	-.122	118	.149	156	.135
8	-.140	45	-.351	82	-.034	119	.109	157	.023
9	-.178	46	-.259	83	-.113	120	.136	158	.378
10	-.553	47	-.120	84	-.327	121	.147	159	.280
11	-.225	48	.042	85	-.126	122	.196	160	.098
12	-.123	49	.118	86	-.249	123	-.053	161	.307
13	-.066	50	.228	87	-.385	124	-.040	162	.158
14	-.040	51	.202	88	-.111	125	.064	163	.083
15	-.391	52	.257	89	-.096	126	.229	164	-.200
16	-.035	53	.265	90	-.267	127	.121	165	-.200
17	-.027	54	.321	91	-.515	128	.259	166	-.182
18	.188	55	-.723	92	-.486	129	.313	167	-.072
19	.061	56	-.493	93	-.546	130	.391	168	-.146
20	.173	57	-.684	94	-.324	131	.396	169	-.231
21	.117	58	-.351	95	-.045	132	-.321	170	-.209
22	.227	59	-.147	96	-.473	133	-.409	171	-.106
23	.061	60	-.392	97	-.582	134	-.224	172	-.151
24	.058	61	-.606	98	-.367	135	.022	173	-.147
25	.067	62	-.490	99	-.607	136	.064	174	-.212
26	-.243	63	-.359	100	.006	137	.321	175	-.103
27	-.410	64	-.563	101	.078	138	.062	176	-.174
28	-.460	65	-.389	102	.181	139	.004	177	-.119
29	-.476	66	.032	103	.153	140	.406	178	-.122
30	-.262	67	.631	104	.201	141	.233	179	-.171
31	-.090	68	.132	105	.230	142	.236	180	-.257
32	.018	69	-.508	106	.312	144	.284	181	-.250
33	.141	70	-.452	107	.280	145	.281	182	-.219
34	.231	71	-.367	108	-.080	146	.245	183	-.206
35	.248	72	.024	109	.015	147	.267	184	-.322
36	.159	73	-.060	110	.145	148	.153	185	-.202
37	-.223	74	.513	111	.107	149	.057	186	-.376

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 180   BREAKWATER   0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.194	38	-.341	75	-.155	112	-.307	150	.270
2	-.095	39	-.297	76	-.151	113	-.441	151	.407
3	-.273	40	-.448	77	-.164	114	-.437	152	.351
4	-.419	41	-.177	78	-.070	115	-.483	153	.362
5	-.858	42	-.283	79	-.158	116	-.151	154	.366
6	-.104	43	-.293	80	-.161	117	-.143	155	.420
7	-.239	44	-.439	81	-.145	118	-.075	156	.341
8	-.302	45	-.231	82	-.069	119	-.193	157	.212
9	-.472	46	-.127	83	-.160	120	-.263	158	.339
10	-.775	47	-.228	84	-.176	121	-.388	159	.385
11	-.238	48	-.232	85	-.166	122	-.394	160	.449
12	-.265	49	-.240	86	-.116	123	-.475	161	.100
13	-.348	50	-.181	87	-.199	124	-.179	162	.083
14	-.340	51	-.336	88	-.171	125	-.203	163	.170
15	-1.003	52	-.304	89	-.174	126	-.134	164	-.656
16	-.174	53	-.405	90	-.130	127	-.343	165	-.368
17	-.173	54	-.472	91	-.231	128	-.330	166	-.215
18	.004	55	-.933	92	-.231	129	-.400	167	-.075
19	-.086	56	-.952	93	-.205	130	-.380	168	-.153
20	-.054	57	-.773	94	-.115	131	-.709	169	-.532
21	-.033	58	-.337	95	-.189	132	-.215	170	-.298
22	.242	59	-.833	96	-.191	133	-.219	171	-.102
23	-.118	60	-.850	97	-.204	134	-.172	172	-.153
24	-.258	61	-.574	98	-.124	135	-.244	173	-.130
25	-.142	62	-.363	99	-.211	136	-.321	174	-.272
26	-.141	63	-.521	100	-.162	137	-.583	175	-.124
27	-.281	64	-.971	101	-.185	138	-.189	176	-.168
28	-.274	65	.030	102	-.124	139	-.382	177	-.129
29	-.260	66	.565	103	-.265	140	.327	178	-.125
30	-.136	67	-.564	104	-.352	141	.482	179	-.388
31	-.276	68	-.532	105	-.474	142	.421	180	-.621
32	-.328	69	-.440	106	-.442	144	.492	181	-.514
33	-.388	70	-.333	107	-.504	145	.491	182	-.337
34	-.327	71	-.399	108	-.172	146	.515	183	-.117
35	-.359	72	.229	109	-.170	147	.556	184	-.197
36	-.659	73	.300	110	-.106	148	.500	185	-.440
37	-.353	74	-.041	111	-.230	149	.457	186	-.689

WIND DIRECTION 180   BREAKWATER   1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.112	38	-.090	75	-.085	112	-.088	150	-.044
2	.024	39	-.028	76	-.092	113	-.086	151	.029
3	-.116	40	-.124	77	-.098	114	-.001	152	-.032
4	-.126	41	-.180	78	-.002	115	-.102	153	-.030
5	-.184	42	-.199	79	-.048	116	-.086	154	-.028
6	-.025	43	-.169	80	-.101	117	-.072	155	.029
7	-.098	44	-.242	81	-.068	118	.010	156	-.061
8	-.109	45	-.152	82	-.008	119	-.078	157	-.013
9	-.135	46	-.043	83	-.101	120	-.075	158	.127
10	-.099	47	-.121	84	-.110	121	-.077	159	.162
11	-.144	48	-.111	85	-.102	122	.001	160	.061
12	-.086	49	-.100	86	-.047	123	-.100	161	.152
13	-.098	50	-.011	87	-.154	124	-.124	162	.094
14	-.048	51	-.084	88	-.095	125	-.122	163	.125
15	-.206	52	-.040	89	-.092	126	-.024	164	-.176
16	-.083	53	-.009	90	-.060	127	-.219	165	-.084
17	-.055	54	.090	91	-.166	128	-.135	166	-.062
18	.090	55	-.521	92	-.179	129	-.121	167	.021
19	-.078	56	-.448	93	-.156	130	-.025	168	-.062
20	.097	57	-.231	94	-.052	131	-.074	169	-.126
21	-.029	58	.174	95	-.114	132	-.130	170	-.061
22	.288	59	-.062	96	-.145	133	-.141	171	.025
23	.066	60	-.395	97	-.164	134	-.050	172	-.051
24	.139	61	-.316	98	-.062	135	-.133	173	-.059
25	.081	62	-.122	99	-.169	136	-.154	174	-.043
26	-.063	63	-.259	100	-.114	137	-.236	175	.027
27	-.191	64	-.384	101	-.098	138	.007	176	-.047
28	-.182	65	.049	102	-.010	139	-.136	177	-.050
29	-.180	66	.269	103	-.099	140	.048	178	-.054
30	-.065	67	.061	104	-.098	141	-.052	179	.104
31	-.143	68	-.212	105	-.098	142	.026	180	-.020
32	-.144	69	-.203	106	-.013	144	-.055	181	.018
33	-.100	70	-.093	107	-.117	145	-.052	182	-.009
34	.019	71	-.166	108	-.107	146	-.041	183	-.047
35	.045	72	.165	109	-.088	147	.025	184	-.134
36	.047	73	.298	110	-.006	148	-.066	185	-.105
37	-.031	74	.297	111	-.092	149	.010	186	-.121

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 180   BREAKWATER 1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.092	38	-.234	75	-.076	112	-.185	150	-.090
2	-.012	39	-.180	76	-.061	113	-.217	151	.138
3	-.167	40	-.319	77	-.064	114	-.147	152	.149
4	-.341	41	-.054	78	.018	115	-.249	153	.205
5	-.698	42	-.152	79	-.056	116	-.072	154	.250
6	-.034	43	-.134	80	-.057	117	-.083	155	.329
7	-.125	44	-.260	81	-.063	118	-.014	156	.271
8	-.185	45	-.095	82	.022	119	-.119	157	.215
9	-.433	46	-.011	83	-.053	120	-.147	158	.546
10	-.582	47	-.092	84	-.064	121	-.186	159	.617
11	-.118	48	-.104	85	-.042	122	-.137	160	.543
12	-.158	49	-.130	86	0.000	123	-.237	161	.556
13	-.256	50	-.093	87	-.082	124	-.074	162	.554
14	-.290	51	-.217	88	-.048	125	-.107	163	.440
15	-.775	52	-.184	89	-.037	126	-.037	164	-.558
16	.250	53	-.129	90	-.011	127	-.270	165	-.156
17	.195	54	-.095	91	-.096	128	-.212	166	-.056
18	.462	55	-.707	92	-.107	129	-.217	167	.052
19	.305	56	-.729	93	-.067	130	-.142	168	-.014
20	.445	57	-.408	94	.023	131	-.256	169	-.438
21	.362	58	-.012	95	-.040	132	-.097	170	-.099
22	.469	59	-.463	96	-.049	133	-.090	171	.058
23	.349	60	-.655	97	-.065	134	-.083	172	.001
24	.348	61	-.379	98	.013	135	-.133	173	.006
25	.294	62	-.253	99	-.076	136	-.223	174	-.047
26	-.018	63	-.379	100	-.067	137	-.395	175	.042
27	-.127	64	-.706	101	-.114	138	-.030	176	-.013
28	-.113	65	.302	102	-.051	139	-.222	177	.003
29	-.115	66	.525	103	-.174	140	.043	178	.004
30	-.012	67	-.246	104	-.208	141	-.001	179	.047
31	-.136	68	-.357	105	-.236	142	-.023	180	-.169
32	-.184	69	-.335	106	-.163	144	.086	181	-.025
33	-.260	70	-.243	107	-.272	145	.122	182	.002
34	-.177	71	-.317	108	-.078	146	.197	183	.038
35	-.123	72	.473	109	-.102	147	.333	184	-.035
36	-.006	73	.432	110	-.039	148	.311	185	-.280
37	-.234	74	.199	111	-.153	149	.263	186	-.390

WIND DIRECTION 225   BREAKWATER 0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.465	38	-.499	75	-.313	112	-.335	150	-.047
2	-.520	39	-.324	76	-.318	113	-.334	151	.084
3	-1.038	40	-.622	77	-.336	114	-.246	152	.151
4	-1.209	41	-.292	78	-.214	115	-.318	153	.201
5	-.498	42	-.385	79	-.325	116	-.253	154	.245
6	-.432	43	-.334	80	-.332	117	-.267	155	.340
7	-.488	44	-.343	81	-.310	118	-.193	156	.311
8	-.268	45	-.412	82	-.233	119	-.292	157	.377
9	-.342	46	-.298	83	-.336	120	-.305	158	.264
10	-.552	47	-.436	84	-.332	121	-.328	159	.350
11	-.295	48	-.400	85	-.340	122	-.244	160	.309
12	-.095	49	-.348	86	-.256	123	-.317	161	.359
13	-.328	50	-.296	87	-.384	124	-.364	162	.331
14	-.239	51	-.477	88	-.326	125	-.363	163	.386
15	-.985	52	-.502	89	-.327	126	-.277	164	.333
16	.026	53	-.546	90	-.246	127	-.403	165	.244
17	-.013	54	-.522	91	-.383	128	-.393	166	.193
18	.293	55	-1.004	92	-.412	129	-.420	167	.221
19	.075	56	-.872	93	-.376	130	-.415	168	.039
20	.253	57	-.611	94	-.272	131	-.610	169	.388
21	-.065	58	-.720	95	-.337	132	-.335	170	.307
22	.323	59	-1.011	96	-.333	133	-.339	171	.297
23	-.066	60	-.643	97	-.355	134	-.250	172	.153
24	-.155	61	-.509	98	-.261	135	-.429	173	.029
25	-.002	62	-.532	99	-.354	136	-.460	174	.325
26	-.268	63	-.979	100	-.330	137	-.542	175	.323
27	-.407	64	-.772	101	-.318	138	-.220	176	.191
28	-.417	65	.571	102	-.225	139	-.547	177	-.128
29	-.366	66	-.223	103	-.343	140	-.056	178	-.031
30	-.258	67	-.888	104	-.364	141	.059	179	.517
31	-.484	68	-.550	105	-.340	142	.065	180	.401
32	-.492	69	-.439	106	-.265	144	.278	181	.414
33	-.516	70	-.447	107	-.346	145	.227	182	.372
34	-.483	71	-.717	108	-.366	146	.270	183	-.228
35	-.746	72	.402	109	-.346	147	.365	184	-.363
36	-.515	73	-.502	110	-.250	148	.332	185	-.413
37	-.374	74	-.296	111	-.337	149	.423	186	-.540

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 225   BREAKWATER 1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.409	38	-.345	75	-.236	112	-.234	150	-.185
2	-.416	39	-.274	76	-.242	113	-.288	151	-.125
3	-.801	40	-.495	77	-.255	114	-.221	152	-.135
4	-1.084	41	-.253	78	-.129	115	-.324	153	-.170
5	-.444	42	-.290	79	-.244	116	-.135	154	-.234
6	-.251	43	-.239	80	-.259	117	-.125	155	-.248
7	-.392	44	-.260	81	-.230	118	-.050	156	-.296
8	-.230	45	-.360	82	-.146	119	-.152	157	.315
9	-.311	46	-.248	83	-.255	120	-.155	158	.126
10	-.376	47	-.255	84	-.279	121	-.162	159	.223
11	-.246	48	-.218	85	-.266	122	-.096	160	.253
12	-.068	49	-.204	86	-.202	123	-.257	161	.253
13	-.291	50	-.145	87	-.317	124	-.206	162	.208
14	-.209	51	-.294	88	-.281	125	-.206	163	.366
15	-.715	52	-.365	89	-.277	126	-.109	164	.345
16	.163	53	-.418	90	-.212	127	-.228	165	.258
17	-.029	54	.017	91	-.331	128	-.252	166	.214
18	.188	55	-.812	92	-.280	129	-.310	167	.235
19	-.045	56	-.618	93	-.319	130	-.268	168	.081
20	.144	57	-.426	94	-.208	131	-.498	169	.214
21	-.064	58	-.528	95	-.277	132	-.333	170	.138
22	.222	59	-.690	96	-.305	133	-.313	171	.146
23	-.043	60	-.423	97	-.321	134	-.276	172	.016
24	-.073	61	-.356	98	-.201	135	-.261	173	-.075
25	.063	62	-.416	99	-.279	136	-.286	174	.161
26	-.277	63	-.764	100	-.175	137	-.376	175	.189
27	-.380	64	-.543	101	-.147	138	-.222	176	.079
28	-.337	65	.422	102	-.056	139	-.472	177	.029
29	-.272	66	-.402	103	-.206	140	-.290	178	-.059
30	-.167	67	-.536	104	-.233	141	-.290	179	.365
31	-.290	68	-.360	105	-.250	142	-.156	180	.249
32	-.287	69	-.351	106	-.143	144	-.196	181	.247
33	-.354	70	-.359	107	-.316	145	-.227	182	.196
34	-.317	71	-.542	108	-.156	146	-.205	183	-.203
35	-.382	72	.336	109	-.134	147	-.172	184	-.308
36	-.160	73	-.361	110	-.064	148	-.243	185	-.288
37	-.353	74	-.129	111	-.188	149	.230	186	-.451

WIND DIRECTION 225   BREAKWATER 1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.599	38	-.438	75	-.543	112	-.254	150	.045
2	-.683	39	-.261	76	-.527	113	-.255	151	.147
3	-1.178	40	-.524	77	-.488	114	-.155	152	.219
4	-.731	41	-.218	78	-.399	115	-.235	153	.253
5	-.372	42	-.306	79	-.513	116	-.226	154	.291
6	-.369	43	-.254	80	-.408	117	-.215	155	.381
7	-.154	44	-.312	81	-.443	118	-.131	156	.366
8	-.191	45	-.373	82	-.380	119	-.238	157	.454
9	-.269	46	-.266	83	-.400	120	-.249	158	.309
10	-.533	47	-.199	84	-.339	121	-.249	159	.394
11	-.167	48	-.262	85	-.303	122	-.149	160	.398
12	-.052	49	-.280	86	-.281	123	-.229	161	.423
13	-.270	50	-.224	87	-.268	124	-.265	162	.392
14	-.177	51	-.344	88	-.244	125	-.268	163	.492
15	-.844	52	-.352	89	-.125	126	-.189	164	.475
16	.300	53	-.371	90	-.264	127	-.295	165	.394
17	.191	54	-.398	91	-.320	128	-.306	166	.351
18	.366	55	-.843	92	-.321	129	-.317	167	.368
19	.148	56	-.738	93	-.305	130	-.305	168	.181
20	.329	57	-.510	94	.003	131	-.477	169	.441
21	.002	58	-.632	95	-.073	132	-.417	170	.385
22	.415	59	-.813	96	-.121	133	-.409	171	.391
23	.018	60	-.459	97	-.180	134	-.409	172	.276
24	-.051	61	-.383	98	-.070	135	-.321	173	.120
25	.080	62	-.424	99	-.144	136	-.339	174	.377
26	-.334	63	-.777	100	-.260	137	-.354	175	.401
27	-.417	64	-.672	101	-.252	138	-.200	176	.309
28	-.361	65	.601	102	-.153	139	-.473	177	.249
29	-.338	66	-.155	103	-.265	140	.040	178	.081
30	-.184	67	-.697	104	-.276	141	.123	179	.547
31	-.339	68	-.370	105	-.260	142	.150	180	.455
32	-.334	69	-.399	106	-.179	144	.341	181	.433
33	-.385	70	-.399	107	-.252	145	.275	182	.409
34	-.350	71	-.648	108	-.244	146	.315	183	-.219
35	-.588	72	.454	109	-.241	147	.402	184	-.203
36	-.378	73	-.445	110	-.145	148	.382	185	-.312
37	-.332	74	-.194	111	-.245	149	.480	186	-.448

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER 0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.801	38	-.325	75	-.748	112	-.118	150	-.075
2	-.620	39	-.404	76	-.739	113	-.117	151	-.011
3	-.751	40	-.365	77	-.472	114	-.044	152	-.111
4	-.792	41	-.302	78	-.616	115	-.129	153	-.134
5	-.810	42	-.185	79	-.727	116	-.120	154	-.183
6	-.670	43	-.270	80	-.466	117	-.123	155	-.201
7	-.814	44	-.238	81	-.772	118	-.039	156	-.489
8	-.793	45	-.342	82	-.563	119	-.111	157	-.592
9	-.809	46	-.160	83	-.359	120	-.098	158	-.503
10	-.657	47	-.248	84	-.296	121	-.100	159	-.572
11	-.609	48	-.217	85	-.224	122	-.036	160	-.660
12	-.638	49	-.190	86	-.203	123	-.119	161	-.467
13	-.634	50	-.090	87	-.125	124	-.218	162	-.675
14	-.535	51	-.205	88	-.179	125	-.194	163	-.518
15	-.617	52	-.199	89	-.099	126	-.085	164	.560
16	-.612	53	-.208	90	-.212	127	-.163	165	.620
17	-.752	54	-.116	91	-.277	128	-.153	166	.608
18	-.623	55	-.574	92	-.158	129	-.163	167	.607
19	-.537	56	-.128	93	-.134	130	-.097	168	.465
20	-.549	57	-.066	94	.075	131	-.194	169	.531
21	-.478	58	-.506	95	-.095	132	-.346	170	.546
22	-.161	59	-.417	96	-.040	133	-.332	171	.573
23	-.358	60	-.265	97	-.104	134	-.278	172	.486
24	-.300	61	-.344	98	-.052	135	-.213	173	.382
25	-.189	62	-.306	99	-.047	136	-.184	174	.411
26	-.295	63	-.400	100	-.137	137	-.180	175	.515
27	-.393	64	-.356	101	-.141	138	-.232	176	.466
28	-.336	65	-.164	102	-.061	139	-.349	177	.437
29	-.257	66	-.385	103	-.145	140	-.119	178	.239
30	-.111	67	-.299	104	-.134	141	-.148	179	.398
31	-.255	68	-.236	105	-.126	142	-.021	180	.400
32	-.227	69	-.215	106	-.049	144	-.133	181	.049
33	-.220	70	-.199	107	-.134	145	-.178	182	.284
34	-.133	71	-.384	108	-.133	146	-.235	183	-.150
35	-.252	72	-.242	109	-.136	147	-.258	184	-.152
36	-.256	73	-.265	110	-.058	148	-.535	185	-.289
37	-.415	74	-.114	111	-.133	149	-.609	186	-.274

WIND DIRECTION 270   BREAKWATER 0 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.744	38	-.355	75	-.804	112	-.173	150	-.153
2	-.624	39	-.383	76	-.808	113	-.170	151	-.106
3	-.732	40	-.350	77	-.547	114	-.091	152	-.220
4	-.804	41	-.307	78	-.652	115	-.188	153	-.244
5	-.887	42	-.204	79	-.788	116	-.179	154	-.298
6	-.691	43	-.264	80	-.538	117	-.175	155	-.280
7	-.748	44	-.238	81	-.817	118	-.096	156	-.506
8	-.796	45	-.348	82	-.626	119	-.160	157	-.840
9	-.849	46	-.182	83	-.456	120	-.165	158	-.521
10	-.698	47	-.250	84	-.353	121	-.167	159	-.646
11	-.604	48	-.230	85	-.281	122	-.093	160	-.843
12	-.628	49	-.212	86	-.251	123	-.181	161	-.503
13	-.634	50	-.122	87	-.189	124	-.274	162	-.748
14	-.548	51	-.212	88	-.233	125	-.247	163	-.658
15	-.521	52	-.209	89	-.152	126	-.139	164	.527
16	-.680	53	-.218	90	-.255	127	-.224	165	.594
17	-.877	54	-.133	91	-.335	128	-.205	166	.586
18	-.639	55	-.615	92	-.214	129	-.206	167	.590
19	-.492	56	-.083	93	-.171	130	-.133	168	.440
20	-.499	57	-.145	94	.014	131	-.226	169	.546
21	-.438	58	-.591	95	-.157	132	-.390	170	.572
22	-.164	59	-.400	96	-.132	133	-.368	171	.590
23	-.338	60	-.264	97	-.153	134	-.332	172	.494
24	-.332	61	-.368	98	-.103	135	-.273	173	.384
25	-.211	62	-.356	99	-.156	136	-.240	174	.412
26	-.325	63	-.407	100	-.190	137	-.224	175	.507
27	-.385	64	-.328	101	-.190	138	-.286	176	.449
28	-.336	65	-.112	102	-.111	139	-.420	177	.432
29	-.270	66	-.479	103	-.198	140	-.174	178	.218
30	-.141	67	-.304	104	-.179	141	-.214	179	.430
31	-.258	68	-.250	105	-.179	142	-.082	180	.403
32	-.238	69	-.278	106	-.100	144	-.179	181	.086
33	-.240	70	-.254	107	-.192	145	-.249	182	.315
34	-.167	71	-.451	108	-.188	146	-.301	183	-.200
35	-.271	72	-.237	109	-.185	147	-.269	184	-.200
36	-.283	73	-.395	110	-.112	148	-.470	185	-.321
37	-.420	74	-.181	111	-.195	149	-.914	186	-.301

TABLE 2   (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER   0 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.888	38	-.336	75	-.994	112	-.155	150	-.083
2	-.669	39	-.401	76	-.663	113	-.155	151	-.019
3	-.721	40	-.365	77	-.369	114	-.065	152	-.107
4	-.733	41	-.309	78	-.875	115	-.185	153	-.144
5	-.775	42	-.192	79	-.636	116	-.153	154	-.192
6	-.714	43	-.252	80	-.350	117	-.150	155	-.213
7	-.837	44	-.237	81	-.996	118	-.069	156	-.506
8	-.787	45	-.422	82	-.358	119	-.169	157	-.593
9	-.780	46	-.191	83	-.368	120	-.152	158	-.530
10	-.658	47	-.237	84	-.293	121	-.154	159	-.558
11	-.515	48	-.217	85	-.304	122	-.079	160	-.616
12	-.622	49	-.205	86	-.292	123	-.172	161	-.481
13	-.629	50	-.113	87	-.219	124	-.214	162	-.650
14	-.546	51	-.203	88	-.269	125	-.206	163	-.483
15	-.630	52	-.200	89	-.176	126	-.113	164	.526
16	-.603	53	-.229	90	-.267	127	-.208	165	.599
17	-.777	54	-.141	91	-.351	128	-.187	166	.618
18	-.631	55	-.508	92	-.228	129	-.198	167	.658
19	-.548	56	-.243	93	-.272	130	-.130	168	.599
20	-.589	57	-.110	94	.077	131	-.246	169	.487
21	-.511	58	-.472	95	-.240	132	-.398	170	.555
22	-.220	59	-.361	96	-.168	133	-.396	171	.617
23	-.373	60	-.265	97	-.176	134	-.260	172	.595
24	-.246	61	-.331	98	-.156	135	-.266	173	.553
25	-.206	62	-.264	99	-.184	136	-.224	174	.404
26	-.315	63	-.407	100	-.160	137	-.160	175	.531
27	-.401	64	-.368	101	-.158	138	-.245	176	.530
28	-.342	65	-.275	102	-.073	139	-.330	177	.535
29	-.284	66	-.345	103	-.144	140	-.121	178	.392
30	-.139	67	-.260	104	-.165	141	-.147	179	.352
31	-.255	68	-.230	105	-.164	142	-.027	180	.375
32	-.232	69	-.247	106	-.080	144	-.128	181	.023
33	-.231	70	-.235	107	-.190	145	-.187	182	.273
34	-.149	71	-.450	108	-.153	146	-.263	183	-.136
35	-.236	72	-.338	109	-.149	147	-.303	184	-.014
36	-.251	73	-.288	110	-.070	148	-.565	185	-.299
37	-.433	74	-.136	111	-.172	149	-.595	186	-.302

WIND DIRECTION 270   BREAKWATER   1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.798	38	-.222	75	-.622	112	-.122	150	-.113
2	-.641	39	-.265	76	-.545	113	-.124	151	-.053
3	-.777	40	-.250	77	-.291	114	-.034	152	-.141
4	-.830	41	-.215	78	-.439	115	-.134	153	-.170
5	-.940	42	-.117	79	-.498	116	-.130	154	-.184
6	-.505	43	-.211	80	-.277	117	-.121	155	-.124
7	-.676	44	-.193	81	-.560	118	-.023	156	-.247
8	-.674	45	-.265	82	-.307	119	-.114	157	-.407
9	-.698	46	-.053	83	-.205	120	-.119	158	-.137
10	-.417	47	-.238	84	-.173	121	-.120	159	-.290
11	-.358	48	-.200	85	-.125	122	-.037	160	-.819
12	-.411	49	-.182	86	-.119	123	-.129	161	-.142
13	-.429	50	-.087	87	-.058	124	-.213	162	-.358
14	-.287	51	-.175	88	-.102	125	-.181	163	-.646
15	-.220	52	-.181	89	-.033	126	-.065	164	.568
16	-.524	53	-.190	90	-.134	127	-.162	165	.603
17	-.461	54	-.097	91	-.207	128	-.159	166	.587
18	-.328	55	-.666	92	-.179	129	-.157	167	.593
19	-.330	56	.082	93	-.125	130	-.072	168	.481
20	-.209	57	-.277	94	.110	131	-.172	169	.446
21	-.255	58	-.621	95	-.082	132	-.272	170	.484
22	-.032	59	-.398	96	-.079	133	-.242	171	.512
23	-.241	60	-.251	97	-.097	134	-.166	172	.422
24	-.286	61	-.360	98	-.030	135	-.196	173	.305
25	-.142	62	-.387	99	-.086	136	-.184	174	.401
26	-.212	63	-.335	100	-.138	137	-.190	175	.506
27	-.280	64	-.144	101	-.133	138	-.181	176	.461
28	-.258	65	.036	102	-.045	139	-.323	177	.421
29	-.244	66	-.566	103	-.138	140	-.140	178	.243
30	-.107	67	-.302	104	-.130	141	-.161	179	.206
31	-.225	68	-.237	105	-.128	142	-.046	180	.328
32	-.210	69	-.241	106	-.041	144	-.132	181	.061
33	-.214	70	-.182	107	-.140	145	-.187	182	.286
34	-.132	71	-.363	108	-.135	146	-.219	183	-.090
35	-.273	72	-.063	109	-.128	147	-.170	184	-.004
36	-.262	73	-.490	110	-.036	148	-.316	185	-.125
37	-.312	74	-.128	111	-.125	149	-.507	186	-.046

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER 1 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.862	38	-.227	75	-.802	112	-.133	150	-.042
2	-.655	39	-.291	76	-.420	113	-.136	151	.029
3	-.743	40	-.255	77	-.239	114	-.052	152	-.035
4	-.740	41	-.223	78	-.595	115	-.152	153	-.047
5	-.777	42	-.134	79	-.380	116	-.129	154	-.057
6	-.484	43	-.219	80	-.245	117	-.125	155	-.034
7	-.703	44	-.196	81	-.623	118	-.042	156	-.269
8	-.660	45	-.289	82	-.216	119	-.134	157	-.400
9	-.675	46	-.116	83	-.230	120	-.134	158	-.254
10	-.499	47	-.208	84	-.218	121	-.134	159	-.409
11	-.298	48	-.183	85	-.205	122	-.052	160	-.595
12	-.411	49	-.178	86	-.173	123	-.143	161	-.229
13	-.433	50	-.091	87	-.145	124	-.188	162	-.465
14	-.333	51	-.185	88	-.191	125	-.172	163	-.461
15	-.349	52	-.166	89	-.145	126	-.076	164	.573
16	-.474	53	-.208	90	-.165	127	-.161	165	.640
17	-.409	54	-.126	91	-.236	128	-.163	166	.641
18	-.428	55	-.576	92	-.179	129	-.177	167	.677
19	-.351	56	.049	93	-.185	130	-.099	168	.614
20	-.293	57	-.137	94	-.016	131	-.201	169	.433
21	-.277	58	-.112	95	-.155	132	-.297	170	.503
22	-.041	59	-.388	96	-.131	133	-.285	171	.569
23	-.224	60	-.230	97	-.151	134	-.200	172	.530
24	-.223	61	-.327	98	-.081	135	-.210	173	.460
25	-.111	62	-.246	99	-.142	136	-.187	174	.445
26	-.230	63	-.269	100	-.140	137	-.139	175	.554
27	-.304	64	-.153	101	-.134	138	-.169	176	.540
28	-.244	65	-.021	102	-.049	139	-.250	177	.527
29	-.214	66	-.457	103	-.146	140	-.094	178	.350
30	-.109	67	-.275	104	-.141	141	-.123	179	.287
31	-.231	68	-.208	105	-.139	142	.009	180	.334
32	-.200	69	-.236	106	-.056	144	-.058	181	.128
33	-.205	70	-.168	107	-.152	145	-.114	182	.334
34	-.129	71	-.329	108	-.129	146	-.154	183	-.086
35	-.254	72	-.104	109	-.124	147	-.140	184	-.036
36	-.247	73	-.357	110	-.043	148	-.348	185	-.133
37	-.325	74	-.117	111	-.135	149	-.430	186	-.102

WIND DIRECTION 270   BREAKWATER 2 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.761	38	-.138	75	-.556	112	-.091	150	-.089
2	-.603	39	-.204	76	-.398	113	-.092	151	-.030
3	-.721	40	-.202	77	-.202	114	-.010	152	-.125
4	-.740	41	-.163	78	-.360	115	-.110	153	-.139
5	-.801	42	-.083	79	-.384	116	-.104	154	-.148
6	-.347	43	-.160	80	-.182	117	-.104	155	-.084
7	-.544	44	-.151	81	-.469	118	-.014	156	-.193
8	-.542	45	-.216	82	-.193	119	-.098	157	-.287
9	-.531	46	-.015	83	-.121	120	-.093	158	-.095
10	-.304	47	-.178	84	-.124	121	-.091	159	-.194
11	-.200	48	-.147	85	-.084	122	-.013	160	-.746
12	-.269	49	-.135	86	-.096	123	-.104	161	-.089
13	-.299	50	-.042	87	-.047	124	-.163	162	-.271
14	-.174	51	-.134	88	-.081	125	-.147	163	-.582
15	-.143	52	-.131	89	-.044	126	-.042	164	.541
16	-.399	53	-.148	90	-.106	127	-.138	165	.594
17	-.309	54	-.058	91	-.169	128	-.131	166	.596
18	-.210	55	-.577	92	-.141	129	-.129	167	.594
19	-.247	56	.104	93	-.120	130	-.051	168	.456
20	-.132	57	-.241	94	.072	131	-.148	169	.374
21	-.188	58	-.533	95	-.087	132	-.243	170	.440
22	.009	59	-.318	96	-.078	133	-.212	171	.484
23	-.184	60	-.192	97	-.093	134	-.148	172	.390
24	-.225	61	-.297	98	-.027	135	-.155	173	.277
25	-.094	62	-.308	99	-.088	136	-.146	174	.361
26	-.173	63	-.262	100	-.111	137	-.152	175	.466
27	-.229	64	-.093	101	-.112	138	-.144	176	.414
28	-.205	65	.045	102	-.024	139	-.266	177	.385
29	-.185	66	-.493	103	-.112	140	-.115	178	.223
30	-.059	67	-.241	104	-.101	141	-.127	179	.130
31	-.143	68	-.181	105	-.101	142	-.023	180	.238
32	-.154	69	-.207	106	-.018	144	-.115	181	.051
33	-.164	70	-.165	107	-.118	145	-.152	182	.242
34	-.083	71	-.315	108	-.107	146	-.178	183	-.067
35	-.212	72	-.050	109	-.104	147	-.128	184	-.008
36	-.205	73	-.453	110	-.015	148	-.263	185	-.089
37	-.251	74	-.098	111	-.097	149	-.413	186	-.006

TABLE 2   (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER 2 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.835	38	-.163	75	-.728	112	-.117	150	-.034
2	-.648	39	-.262	76	-.364	113	-.123	151	.032
3	-.754	40	-.221	77	-.216	114	-.046	152	-.045
4	-.741	41	-.188	78	-.507	115	-.148	153	-.055
5	-.777	42	-.115	79	-.337	116	-.106	154	-.064
6	-.356	43	-.205	80	-.211	117	-.106	155	-.028
7	-.607	44	-.173	81	-.513	118	-.029	156	-.220
8	-.573	45	-.248	82	-.165	119	-.122	157	-.303
9	-.570	46	-.077	83	-.202	120	-.115	158	-.136
10	-.378	47	-.191	84	-.192	121	-.117	159	-.289
11	-.222	48	-.158	85	-.173	122	-.043	160	-.573
12	-.295	49	-.154	86	-.147	123	-.140	161	-.121
13	-.327	50	-.074	87	-.123	124	-.172	162	-.341
14	-.213	51	-.181	88	-.162	125	-.154	163	-.442
15	-.219	52	-.149	89	-.122	126	-.062	164	.540
16	-.414	53	-.186	90	-.144	127	-.147	165	.622
17	-.255	54	-.110	91	-.213	128	-.148	166	.639
18	-.316	55	-.596	92	-.162	129	-.166	167	.674
19	-.287	56	.109	93	-.155	130	-.093	168	.595
20	-.178	57	-.180	94	-.006	131	-.195	169	.402
21	-.193	58	-.555	95	-.137	132	-.270	170	.474
22	.009	59	-.366	96	-.111	133	-.252	171	.538
23	-.198	60	-.204	97	-.127	134	-.182	172	.482
24	-.210	61	-.307	98	-.056	135	-.192	173	.376
25	-.079	62	-.303	99	-.125	136	-.164	174	.420
26	-.210	63	-.252	100	-.120	137	-.108	175	.518
27	-.287	64	-.113	101	-.115	138	-.138	176	.491
28	-.219	65	.041	102	-.036	139	-.196	177	.468
29	-.189	66	-.491	103	-.137	140	-.077	178	.294
30	-.089	67	-.270	104	-.130	141	-.097	179	.230
31	-.271	68	-.188	105	-.127	142	.012	180	.296
32	-.178	69	-.223	106	-.052	144	-.065	181	.084
33	-.180	70	-.169	107	-.150	145	-.101	182	.295
34	-.110	71	-.309	108	-.112	146	-.132	183	-.060
35	-.254	72	-.053	109	-.103	147	-.102	184	-.021
36	-.228	73	-.398	110	-.030	148	-.270	185	-.069
37	-.285	74	-.110	111	-.123	149	-.338	186	-.036

WIND DIRECTION 270   BREAKWATER 3 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.804	38	-.143	75	-.621	112	-.123	150	-.114
2	-.635	39	-.240	76	-.502	113	-.125	151	-.061
3	-.724	40	-.239	77	-.257	114	-.039	152	-.156
4	-.752	41	-.204	78	-.407	115	-.140	153	-.172
5	-.855	42	-.109	79	-.487	116	-.131	154	-.181
6	-.443	43	-.198	80	-.242	117	-.131	155	-.123
7	-.650	44	-.189	81	-.522	118	-.034	156	-.260
8	-.637	45	-.246	82	-.296	119	-.122	157	-.412
9	-.655	46	-.034	83	-.167	120	-.121	158	-.138
10	-.434	47	-.223	84	-.146	121	-.126	159	-.296
11	-.263	48	-.188	85	-.096	122	-.045	160	-.808
12	-.360	49	-.174	86	-.118	123	-.138	161	-.146
13	-.380	50	-.071	87	-.062	124	-.209	162	-.376
14	-.250	51	-.162	88	-.086	125	-.184	163	-.637
15	-.212	52	-.162	89	-.036	126	-.073	164	.561
16	-.484	53	-.181	90	-.138	127	-.174	165	.621
17	-.393	54	-.080	91	-.203	128	-.162	166	.615
18	-.302	55	-.634	92	-.173	129	-.164	167	.613
19	-.302	56	.104	93	-.137	130	-.080	168	.477
20	-.191	57	-.239	94	.042	131	-.180	169	.452
21	-.240	58	-.598	95	-.092	132	-.276	170	.508
22	-.007	59	-.388	96	-.067	133	-.240	171	.544
23	-.227	60	-.233	97	-.107	134	-.161	172	.459
24	-.272	61	-.351	98	-.039	135	-.202	173	.338
25	-.129	62	-.327	99	-.103	136	-.184	174	.422
26	-.203	63	-.285	100	-.141	137	-.191	175	.525
27	-.267	64	-.129	101	-.141	138	-.179	176	.477
28	-.241	65	.048	102	-.055	139	-.323	177	.448
29	-.223	66	-.547	103	-.150	140	-.141	178	.254
30	-.089	67	-.280	104	-.130	141	-.171	179	.185
31	-.206	68	-.219	105	-.131	142	-.053	180	.278
32	-.194	69	-.249	106	-.046	144	-.140	181	.081
33	-.206	70	-.186	107	-.144	145	-.193	182	.288
34	-.111	71	-.357	108	-.138	146	-.220	183	-.089
35	-.253	72	-.067	109	-.134	147	-.173	184	-.006
36	-.248	73	-.499	110	-.042	148	-.326	185	-.119
37	-.290	74	-.139	111	-.131	149	-.527	186	-.036

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER 3 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.756	38	-.259	75	-.826	112	-.148	150	-.050
2	-.647	39	-.295	76	-.431	113	-.147	151	.019
3	-.812	40	-.252	77	-.253	114	-.069	152	-.049
4	-.890	41	-.219	78	-.620	115	-.174	153	-.059
5	-1.077	42	-.095	79	-.408	116	-.140	154	-.072
6	-.504	43	-.227	80	-.257	117	-.134	155	-.057
7	-.663	44	-.156	81	-.655	118	-.058	156	-.314
8	-.664	45	-.213	82	-.230	119	-.157	157	-.441
9	-.667	46	-.119	83	-.252	120	-.147	158	-.270
10	-.201	47	-.215	84	-.230	121	-.148	159	-.432
11	-.394	48	-.189	85	-.218	122	-.070	160	-.635
12	-.407	49	-.194	86	-.190	123	-.168	161	-.246
13	-.430	50	-.117	87	-.170	124	-.203	162	-.480
14	-.171	51	-.162	88	-.205	125	-.182	163	-.489
15	-.100	52	-.215	89	-.156	126	-.090	164	.554
16	-.386	53	-.220	90	-.185	127	-.180	165	.630
17	-.332	54	-.159	91	-.262	128	-.175	166	.636
18	-.140	55	-.760	92	-.195	129	-.192	167	.665
19	-.180	56	.040	93	-.197	130	-.115	168	.599
20	-.040	57	-.289	94	-.033	131	-.224	169	.441
21	-.098	58	-.702	95	-.176	132	-.310	170	.514
22	.066	59	-.530	96	-.144	133	-.289	171	.581
23	-.130	60	-.286	97	-.160	134	-.206	172	.537
24	-.197	61	-.379	98	-.099	135	-.232	173	.454
25	-.044	62	-.562	99	-.164	136	-.200	174	.446
26	-.229	63	-.522	100	-.151	137	-.150	175	.544
27	-.300	64	-.056	101	-.146	138	-.183	176	.522
28	-.247	65	.198	102	-.065	139	-.271	177	.506
29	-.222	66	-.635	103	-.169	140	-.110	178	.329
30	-.119	67	-.394	104	-.156	141	-.138	179	.311
31	-.260	68	-.266	105	-.151	142	-.007	180	.345
32	-.221	69	-.251	106	-.073	144	-.081	181	.127
33	-.196	70	-.188	107	-.175	145	-.135	182	.345
34	-.178	71	-.357	108	-.144	146	-.178	183	-.095
35	-.352	72	-.107	109	-.135	147	-.168	184	-.047
36	-.296	73	-.396	110	-.062	148	-.367	185	-.144
37	-.337	74	-.137	111	-.155	149	-.469	186	-.101

WIND DIRECTION 270   BREAKWATER 4 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.716	38	-.181	75	-.607	112	-.039	150	-.070
2	-.568	39	-.224	76	-.546	113	-.083	151	-.019
3	-.700	40	-.204	77	-.312	114	-.003	152	-.119
4	-.746	41	-.169	78	-.407	115	-.114	153	-.127
5	-.847	42	-.073	79	-.517	116	-.091	154	-.141
6	-.477	43	-.164	80	-.305	117	-.090	155	-.091
7	-.631	44	-.139	81	-.518	118	-.003	156	-.228
8	-.619	45	-.217	82	-.330	119	-.098	157	-.352
9	-.634	46	-.025	83	-.239	120	-.084	158	-.107
10	-.378	47	-.187	84	-.172	121	-.084	159	-.258
11	-.315	48	-.144	85	-.108	122	-.006	160	-.779
12	-.361	49	-.126	86	-.097	123	-.107	161	-.115
13	-.375	50	-.039	87	-.054	124	-.171	162	-.333
14	-.232	51	-.134	88	-.078	125	-.149	163	-.588
15	-.177	52	-.125	89	-.012	126	-.040	164	.556
16	-.453	53	-.142	90	-.116	127	-.145	165	.620
17	-.377	54	-.053	91	-.198	128	-.125	166	.624
18	-.278	55	-.597	92	-.149	129	-.123	167	.623
19	-.276	56	.114	93	-.087	130	-.046	168	.486
20	-.164	57	-.216	94	.128	131	-.152	169	.452
21	-.211	58	-.532	95	-.048	132	-.245	170	.502
22	.013	59	-.330	96	-.041	133	-.221	171	.544
23	-.195	60	-.191	97	-.067	134	-.151	172	.461
24	-.227	61	-.288	98	.002	135	-.172	173	.367
25	-.091	62	-.310	99	-.065	136	-.149	174	.417
26	-.161	63	-.284	100	-.103	137	-.140	175	.517
27	-.236	64	-.108	101	-.103	138	-.151	176	.471
28	-.208	65	.058	102	-.022	139	-.299	177	.459
29	-.191	66	-.472	103	-.118	140	-.096	178	.291
30	-.056	67	-.241	104	-.096	141	-.114	179	.193
31	-.167	68	-.172	105	-.096	142	-.012	180	.287
32	-.147	69	-.209	106	-.016	144	-.110	181	.097
33	-.157	70	-.161	107	-.123	145	-.143	182	.296
34	-.079	71	-.352	108	-.100	146	-.177	183	-.064
35	-.215	72	-.034	109	-.096	147	-.139	184	.003
36	-.202	73	-.453	110	-.012	148	-.298	185	-.090
37	-.263	74	-.099	111	-.104	149	-.453	186	-.010

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT SEPTEMBER 1975
WIND DIRECTION 270   BREAKWATER 4 BUILDING 2

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.817	38	-.185	75	-.780	112	-.102	150	-.011
2	-.626	39	-.260	76	-.397	113	-.100	151	.054
3	-.714	40	-.211	77	-.208	114	-.025	152	-.017
4	-.690	41	-.186	78	-.544	115	-.125	153	-.028
5	-.722	42	-.104	79	-.361	116	-.092	154	-.042
6	-.410	43	-.190	80	-.209	117	-.087	155	-.027
7	-.655	44	-.156	81	-.576	118	-.014	156	-.261
8	-.618	45	-.244	82	-.183	119	-.110	157	-.382
9	-.614	46	-.085	83	-.205	120	-.098	158	-.251
10	-.453	47	-.169	84	-.182	121	-.098	159	-.389
11	-.249	48	-.136	85	-.169	122	-.025	160	-.571
12	-.339	49	-.139	86	-.147	123	-.119	161	-.221
13	-.381	50	-.059	87	-.125	124	-.151	162	-.437
14	-.283	51	-.159	88	-.156	125	-.135	163	-.431
15	-.324	52	-.125	89	-.110	126	-.032	164	.549
16	-.445	53	-.161	90	-.143	127	-.136	165	.633
17	-.415	54	-.082	91	-.216	128	-.124	166	.656
18	-.414	55	-.509	92	-.146	129	-.135	167	.679
19	-.342	56	.048	93	-.141	130	-.073	168	.613
20	-.280	57	-.105	94	0.000	131	-.175	169	.440
21	-.263	58	-.465	95	-.120	132	-.261	170	.534
22	-.036	59	-.313	96	-.096	133	-.247	171	.588
23	-.213	60	-.177	97	-.114	134	-.172	172	.537
24	-.190	61	-.269	98	-.055	135	-.136	173	.466
25	-.044	62	-.241	99	-.120	136	-.152	174	.449
26	-.196	63	-.231	100	-.110	137	-.095	175	.551
27	-.278	64	-.160	101	-.101	138	-.140	176	.533
28	-.207	65	-.033	102	-.025	139	-.221	177	.524
29	-.178	66	-.389	103	-.125	140	-.066	178	.350
30	-.075	67	-.232	104	-.112	141	-.093	179	.296
31	-.200	68	-.160	105	-.109	142	.031	180	.331
32	-.159	69	-.191	106	-.033	144	-.046	181	.136
33	-.145	70	-.135	107	-.130	145	-.095	182	.357
34	-.092	71	-.299	108	-.100	146	-.137	183	-.059
35	-.214	72	-.100	109	-.090	147	-.128	184	-.009
36	-.202	73	-.294	110	-.017	148	-.339	185	-.120
37	-.265	74	-.079	111	-.113	149	-.411	186	-.098

WIND DIRECTION 315   BREAKWATER 0 BUILDING 0

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.410	38	-.151	75	.441	112	-.294	150	-.255
2	-.736	39	-.396	76	.336	113	-.298	151	-.175
3	-1.363	40	-.050	77	.194	114	-.210	152	-.296
4	-.933	41	-.409	78	.529	115	-.305	153	-.297
5	-.633	42	-.158	79	.372	116	-.269	154	-.320
6	-.672	43	-.506	80	.269	117	-.278	155	-.234
7	-.254	44	-.374	81	.417	118	-.203	156	-.337
8	-.198	45	-.411	82	.401	119	-.295	157	-.306
9	-.185	46	.314	83	.264	120	-.287	158	-.446
10	-.405	47	-.452	84	.131	121	-.291	159	-.347
11	-.604	48	-.394	85	.212	122	-.206	160	-.449
12	-.240	49	-.372	86	-.146	123	-.295	161	-.426
13	-.212	50	-.264	87	.437	124	-.377	162	-.447
14	-.048	51	-.393	88	.204	125	-.350	163	-.343
15	-.278	52	-.393	89	.312	126	-.254	164	.068
16	-.538	53	-.389	90	-.315	127	-.329	165	.217
17	-.459	54	-.231	91	-.076	128	-.320	166	.271
18	-.430	55	-.950	92	-.476	129	-.338	167	.378
19	-.578	56	-.477	93	-.036	130	-.262	168	.432
20	-.509	57	-1.008	94	.435	131	-.371	169	.132
21	-.508	58	-.703	95	.046	132	-.457	170	.249
22	-.381	59	-.607	96	.005	133	-.428	171	.377
23	-.513	60	-.649	97	.068	134	-.372	172	.382
24	-.479	61	-.705	98	.140	135	-.416	173	.527
25	-.414	62	-.221	99	.036	136	-.365	174	.144
26	-.483	63	.145	100	-.270	137	-.327	175	.291
27	-.559	64	-.565	101	-.299	138	-.273	176	.295
28	-.760	65	-.637	102	-.221	139	-.184	177	.387
29	-.565	66	-.392	103	-.314	140	-.369	178	.447
30	-.329	67	-.469	104	-.308	141	-.345	179	.032
31	-.453	68	-.400	105	-.315	142	-.251	180	.010
32	-.423	69	-.552	106	-.221	144	-.344	181	-.089
33	-.413	70	-.149	107	-.311	145	-.346	182	.044
34	-.304	71	.344	108	-.264	146	-.355	183	-.240
35	-.425	72	-.443	109	-.281	147	-.257	184	.451
36	-.157	73	-.425	110	-.210	148	-.344	185	.219
37	-.435	74	-.285	111	-.302	149	-.310	186	-.532

TABLE 2 (Continued)

FLOATING NUCLEAR POWER PLANT   SEPTEMBER 1975
WIND DIRECTION 315   BREAKWATER 1 BUILDING 1

TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.337	38	-.089	75	.441	112	-.210	150	-.107
2	-.571	39	-.313	76	.340	113	-.190	151	.026
3	-1.196	40	.025	77	.202	114	-.113	152	.016
4	-.849	41	-.329	78	.554	115	-.237	153	.026
5	-.603	42	-.084	79	.375	116	-.234	154	.047
6	-.461	43	-.390	80	.294	117	-.248	155	-.002
7	-.178	44	-.291	81	.412	118	-.162	156	-.334
8	-.133	45	-.398	82	.401	119	-.245	157	-.386
9	-.098	46	.365	83	.254	120	-.213	158	-.417
10	-.282	47	-.376	84	.126	121	-.190	159	-.394
11	-.491	48	-.341	85	.190	122	-.113	160	-.477
12	-.162	49	-.316	86	-.150	123	-.222	161	-.375
13	-.160	50	-.210	87	.443	124	-.307	162	-.465
14	.003	51	-.319	88	.196	125	-.312	163	-.388
15	-.204	52	-.307	89	.293	126	-.170	164	.134
16	-.545	53	-.299	90	-.236	127	-.289	165	.268
17	-.377	54	-.050	91	.006	128	-.272	166	.326
18	-.407	55	-.785	92	-.328	129	-.265	167	.418
19	-.467	56	-.369	93	-.039	130	-.176	168	.474
20	-.448	57	-.831	94	.375	131	-.306	169	.182
21	-.383	58	-.377	95	.027	132	-.351	170	.292
22	-.278	59	-.443	96	.003	133	-.349	171	.397
23	-.427	60	-.541	97	.064	134	-.298	172	.393
24	-.373	61	-.606	98	.146	135	-.291	173	.499
25	-.302	62	-.163	99	.046	136	-.281	174	.207
26	-.383	63	.178	100	-.249	137	-.268	175	.328
27	-.440	64	-.450	101	-.259	138	-.229	176	.327
28	-.616	65	-.462	102	-.163	139	-.140	177	.380
29	-.450	66	-.259	103	-.257	140	-.144	178	.403
30	-.242	67	-.335	104	-.236	141	-.173	179	.116
31	-.333	68	-.318	105	-.220	142	-.091	180	.091
32	-.320	69	-.471	106	-.136	144	-.096	181	.004
33	-.318	70	-.010	107	-.248	145	-.196	182	.138
34	-.219	71	.354	108	-.241	146	-.236	183	-.183
35	-.324	72	-.360	109	-.252	147	-.223	184	.465
36	-.108	73	-.306	110	-.166	148	-.403	185	.222
37	-.359	74	-.138	111	-.246	149	-.346	186	-.446

WIND DIRECTION 315   BREAKWATER 1 BUILDING 2

| TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN	TAP	CPMEAN
1	-.425	38	-.195	75	.322	112	-.214	150	-.123
2	-.846	39	-.364	76	.150	113	-.192	151	-.055
3	-1.014	40	-.003	77	.014	114	-.069	152	-.156
4	-.676	41	-.288	78	.384	115	-.133	153	-.167
5	-.479	42	-.080	79	.050	116	-.288	154	-.175
6	-.348	43	-.305	80	-.048	117	-.265	155	-.088
7	-.234	44	-.238	81	.371	118	-.130	156	-.158
8	-.151	45	-.452	82	.078	119	-.212	157	-.133
9	-.235	46	.247	83	-.058	120	-.197	158	-.285
10	-.350	47	-.170	84	-.050	121	-.183	159	-.238
11	-.443	48	-.334	85	-.037	122	-.071	160	-.318
12	-.178	49	-.285	86	-.223	123	-.127	161	-.256
13	-.186	50	-.181	87	.370	124	-.462	162	-.329
14	-.028	51	-.280	88	-.009	125	-.304	163	-.233
15	-.194	52	-.264	89	.144	126	-.192	164	.130
16	-.383	53	-.254	90	-.196	127	-.258	165	.240
17	-.299	54	-.092	91	-.098	128	-.246	166	.289
18	-.329	55	-.771	92	-0.000	129	-.251	167	.384
19	-.447	56	-.313	93	-.006	130	-.158	168	.431
20	-.371	57	-.796	94	.143	131	-.247	169	.033
21	-.361	58	-.540	95	-.116	132	-.344	170	.113
22	-.244	59	-.445	96	-.120	133	-.331	171	.232
23	-.357	60	-.477	97	-.133	134	-.304	172	.226
24	-.321	61	-.574	98	-.098	135	-.357	173	.346
25	-.298	62	-.201	99	-.158	136	-.304	174	.059
26	-.350	63	.151	100	-.307	137	-.204	175	.181
27	-.401	64	-.409	101	-.306	138	-.201	176	.160
28	-.278	65	-.468	102	-.166	139	-.064	177	.205
29	-.224	66	-.247	103	-.243	140	-.190	178	.270
30	-.155	67	-.325	104	-.237	141	-.167	179	.016
31	-.356	68	-.255	105	-.225	142	-.058	180	-.040
32	-.313	69	-.489	106	-.103	144	-.169	181	-.056
33	-.295	70	-.010	107	-.155	145	-.181	182	.009
34	-.211	71	.315	108	-.307	146	-.187	183	-.005
35	-.307	72	-.330	109	-.306	147	-.096	184	.531
36	-.170	73	-.304	110	-.177	148	-.162	185	.122
37	-.390	74	-.184	111	-.241	149	-.131	186	-.379
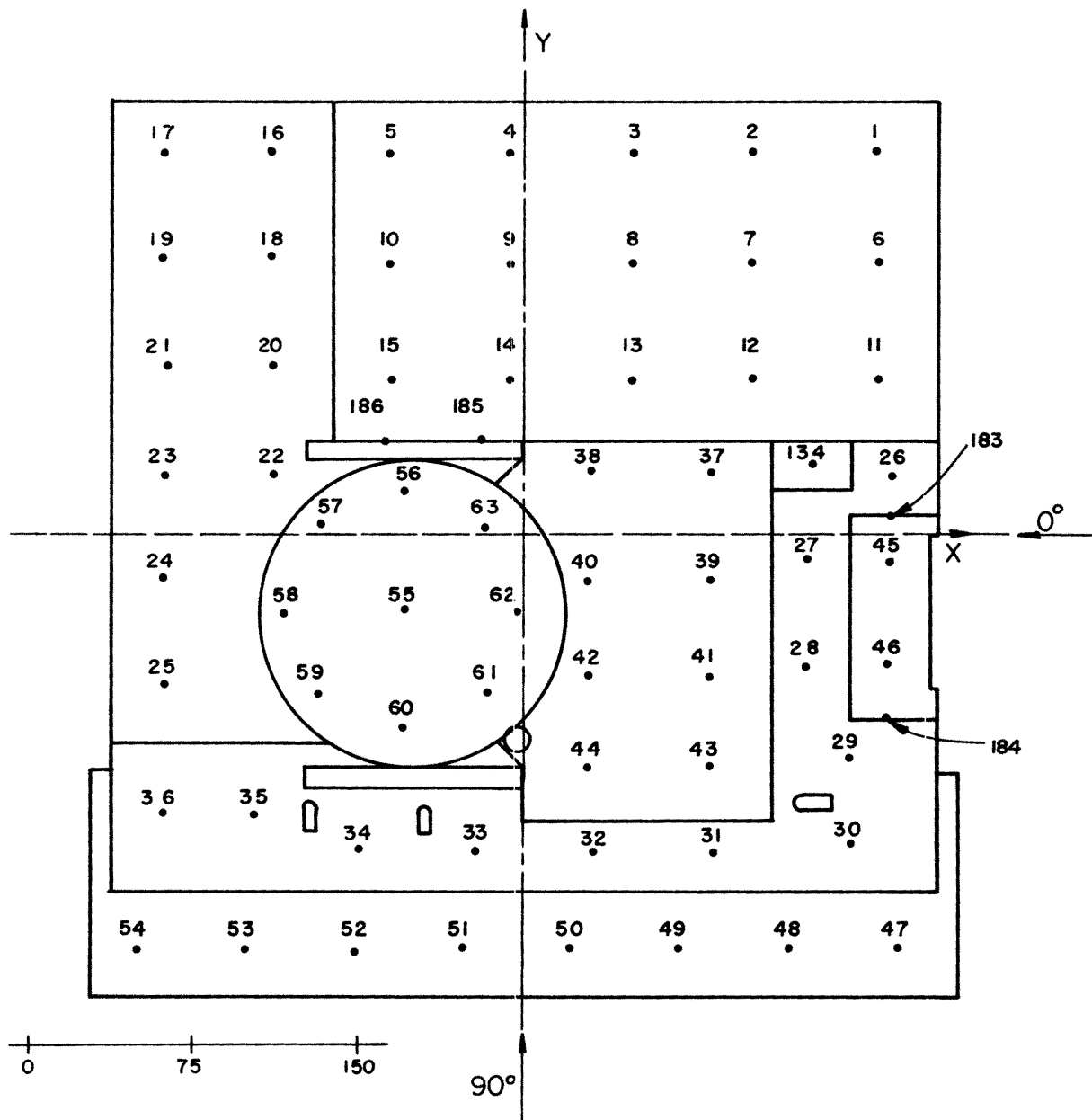
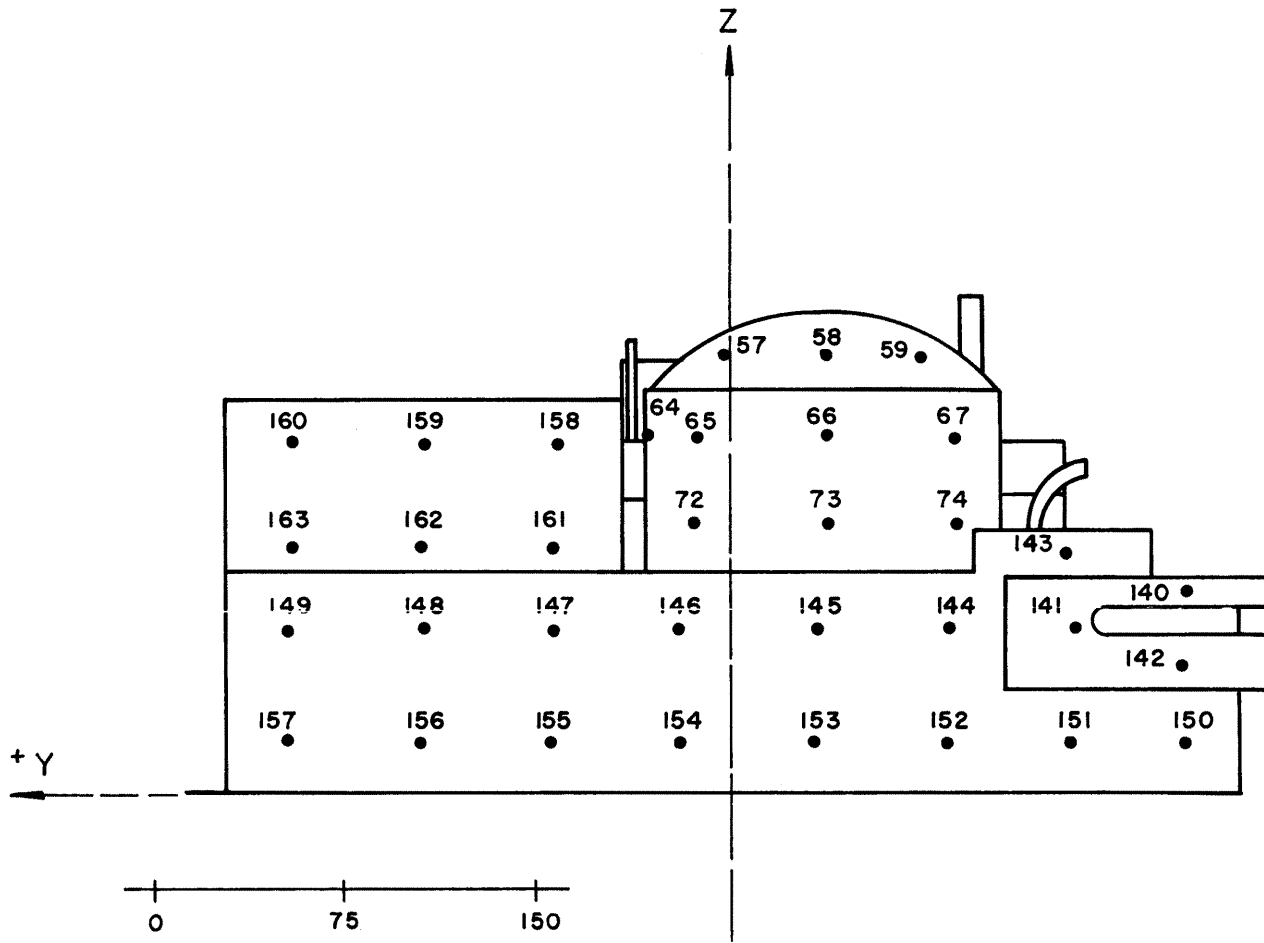Fig. 1a.   Pressure Tap Locations and Coordinate System.

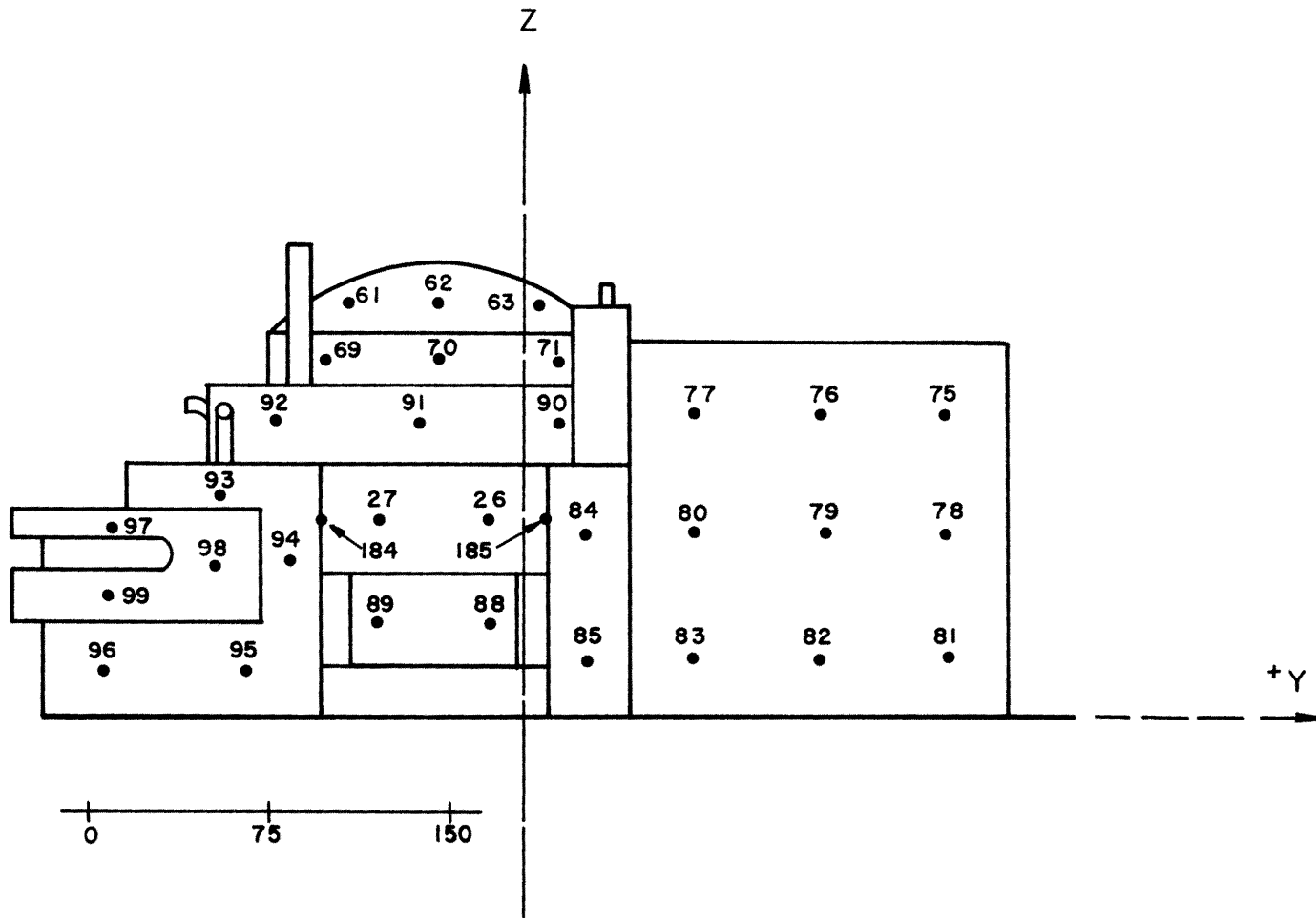Fig. 1b. Pressure Tap Locations and Coordinate System.

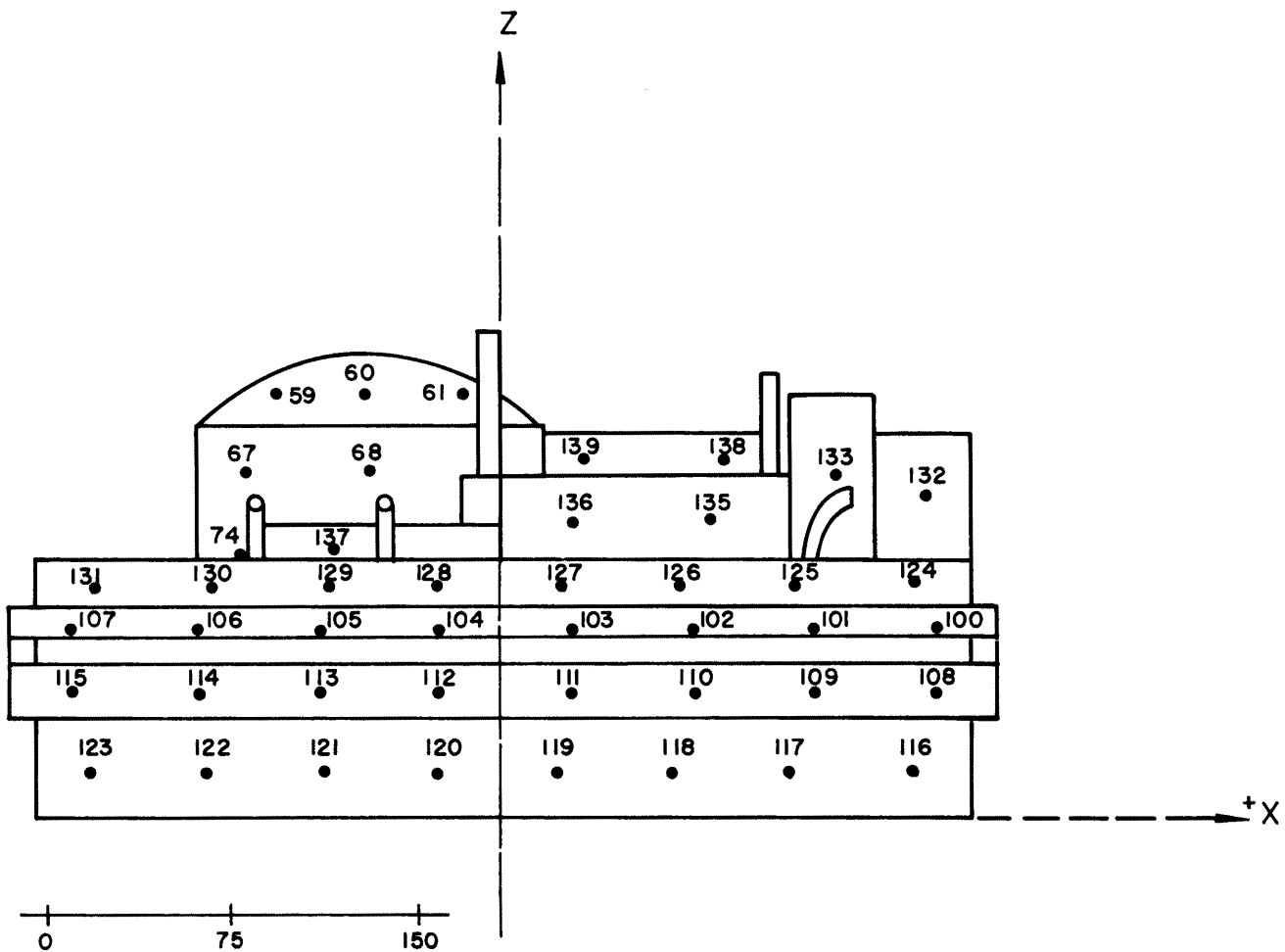Fig. 1c. Pressure Tap Locations and Coordinate System.

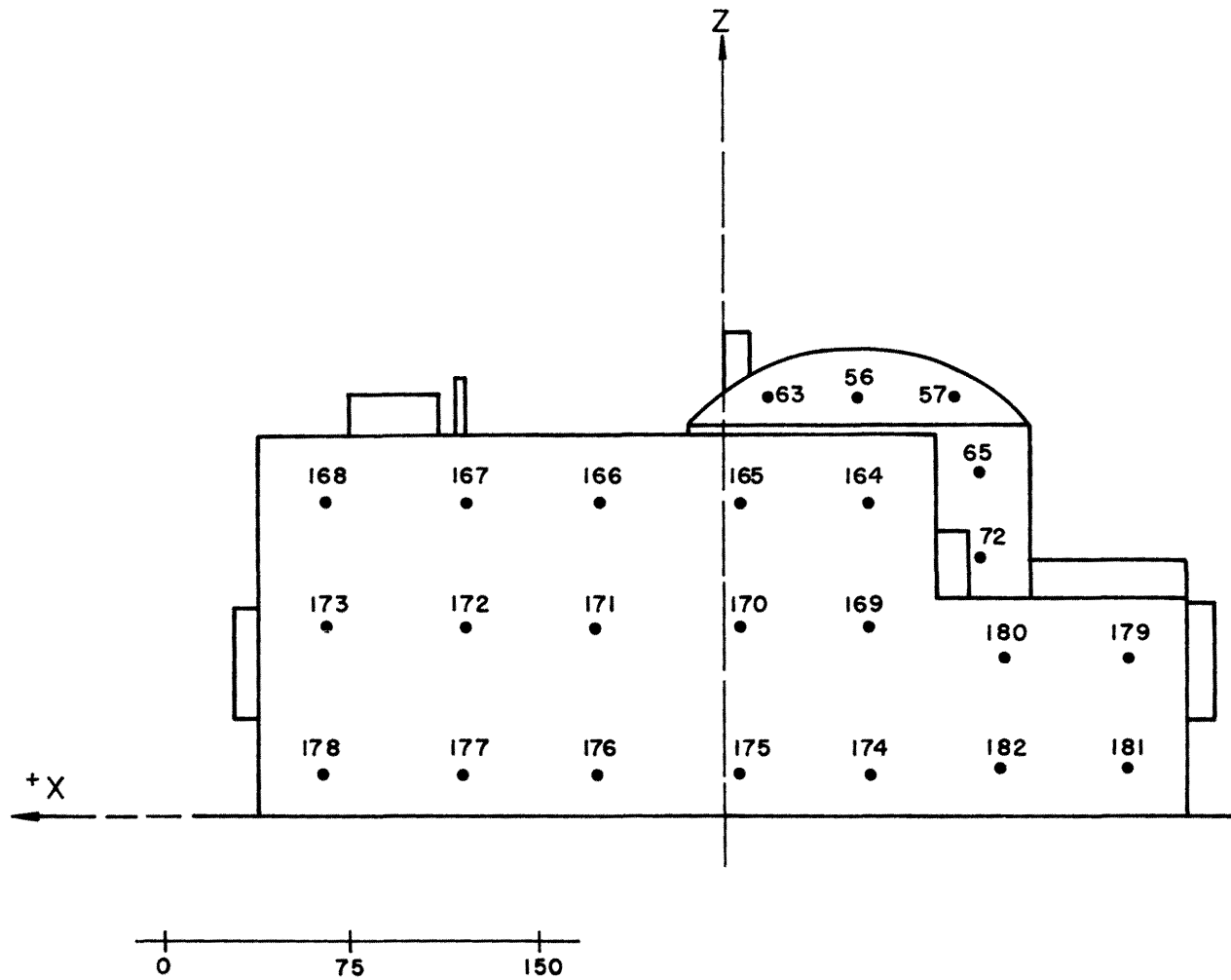Fig. 1d. Pressure Tap Locations and Coordinate System.

Fig. 1e. Pressure Tap Locations and Coordinate System.
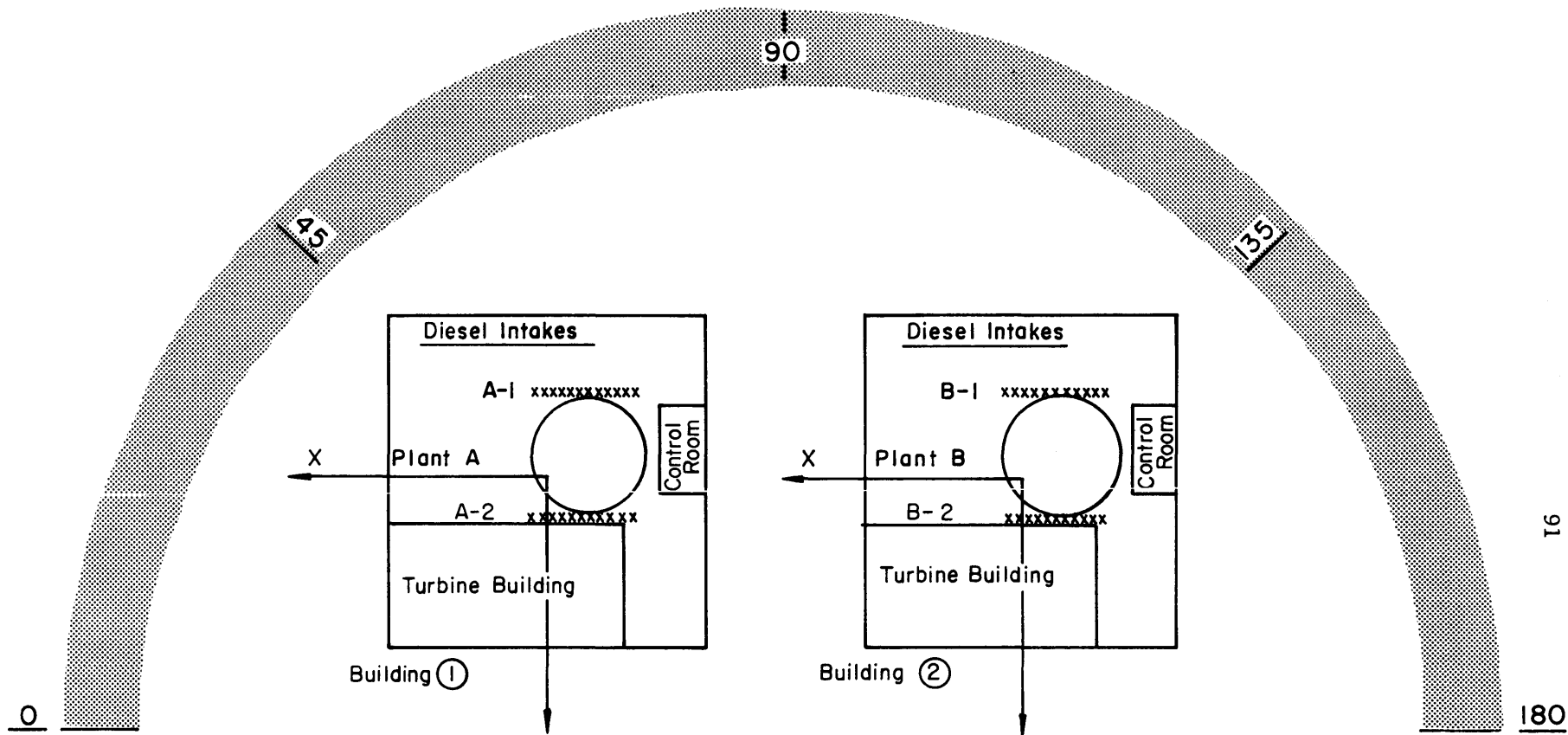
90

45

135

Diesel Intakes

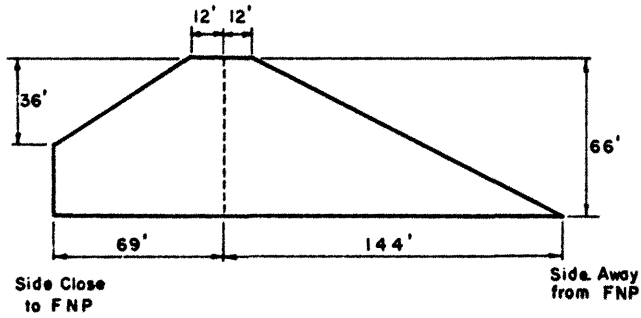A-I xxxxxxxxxxxx

X Plant A

A-2 xxxxxxxxxxxx

Control Room

Turbine Building

Building ①

Diesel Intakes

B-I xxxxxxxxxxxx

X Plant B

B-2 xxxxxxxxxxxx

Control Room

Turbine Building

Building ②

0

91

180

Note: A-I, A-2 are Steam Exhaust Stacks which Exhaust Steam in the Vertical Direction

315

225

270

Bldg 'O' is Bldg ① without Bldg ② or Breakwater

Fig. 2. Power Plant Configuration.

BREAKWATER SCHEME "O" (No Breakwater)

BREAKWATER SCHEME "1"

Current Breakwater Design

12' 12'

36'

66'

69' 144'

Side Close
to FNP

Side Away
from FNP

BREAKWATER SCHEME "3"

12' 12'

36'

66'

69' 278'

Side Close
to FNP

Side Away
from FNP

BREAKWATER SCHEME "2"

12' 12'

60'

90'

69' 181.3'

Side Close
to FNP

Side Away
from FNP
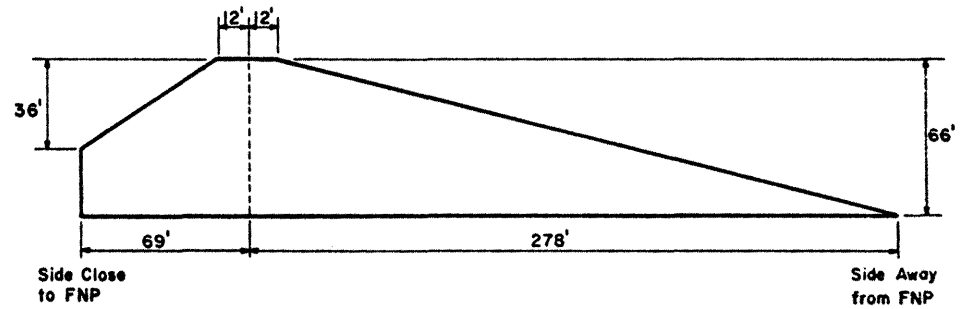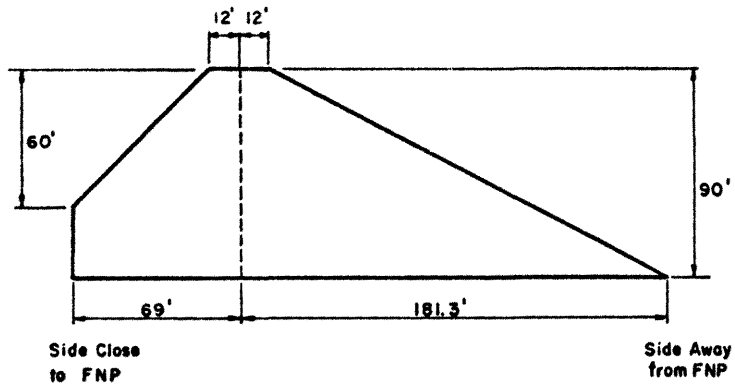
BREAKWATER SCHEME "4"

66'

24'
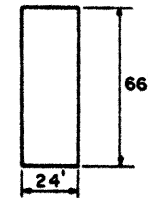
NOTE: This Breakwater Shall be Curved
Around the FNPs as are the
Other Breakwaters

Fig. 3. Breakwater Configuration.

AUXILIARY
INTAKE

POWER
ROOM

REFRIGERATION &
HEATING COILS

18'-0"

AIR TEMP. 200°F-40°F
AIR FLOW (VEL. 1-100 ft./sec)

250
H.P.

4-0"

REFRIGERATION
UNIT 150 Tons

CONTROL
ROOM

VORTEX
GENERATORS

SCREENS

18'-0"

6'-0" UPWIND ROUGHNESS ELEMENTS

6'-9"

AUXILIARY
EXHAUST

18'-0"

40'-0"

BUILDING MODEL
TURNTABLE

BOUNDARY HEAT SOURCE
OR SINK, 32°F - 300°F

88-0" TEST SECTION

PLAN

155'-7"

RETURN DUCT

ADJUSTABLE CEILING FOR
LONGITUDINAL PRESSURE CONTROL

AUXILIARY
EXHAUST

18'-0"

SCREENS

AIR FLOW

MOVABLE VANES

INERTIAL MOUNT AND
BUILDING MODEL

ELEVATION

METEOROLOGICAL WIND TUNNEL (Completed in 1963)
FLUID DYNAMICS & DIFFUSION LABORATORY
COLORADO STATE UNIVERSITY

Fig. 4. Meteorological Wind Tunnel.
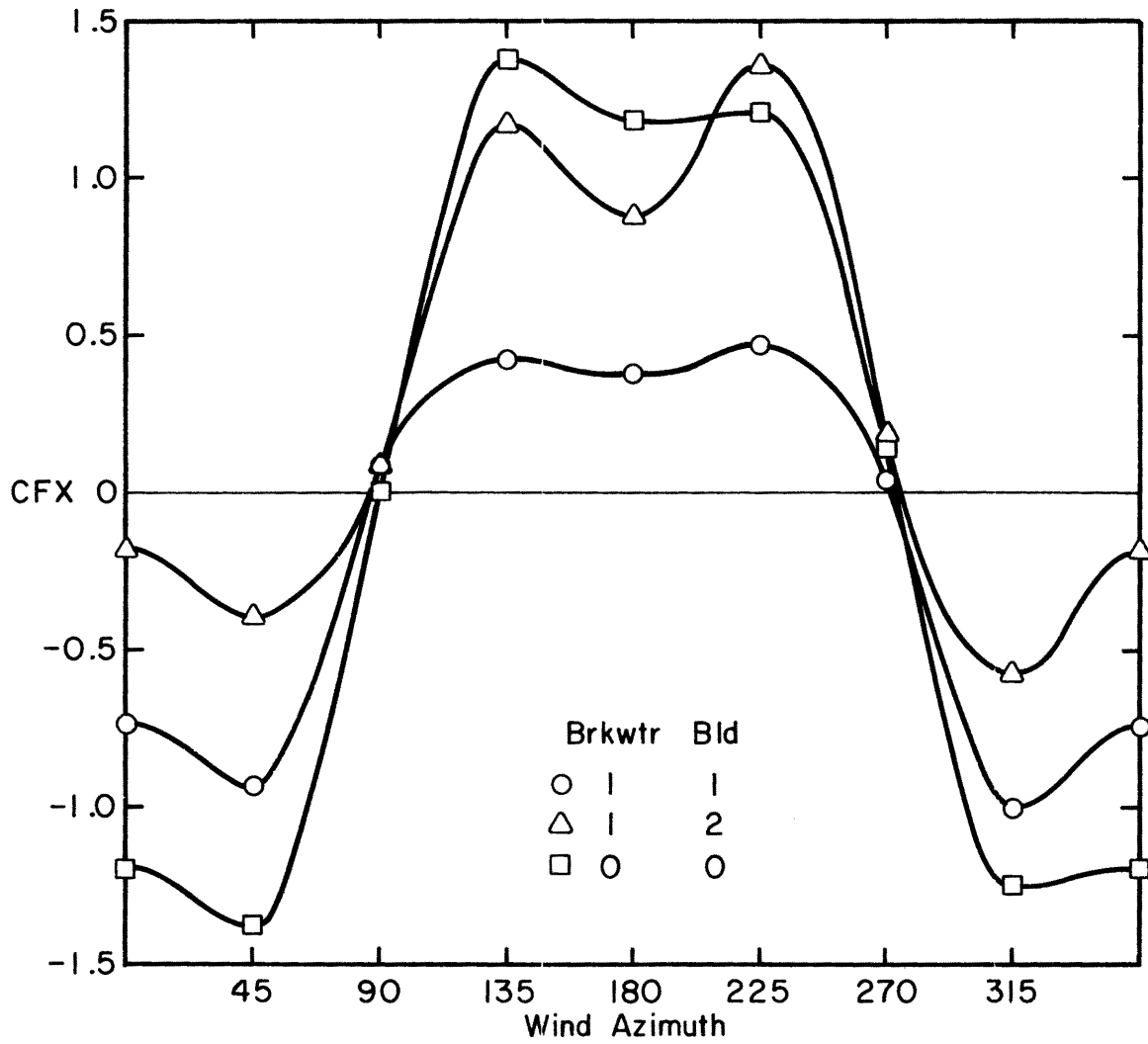
Fig. 5. Variation of CFX with Wind Azimuth.
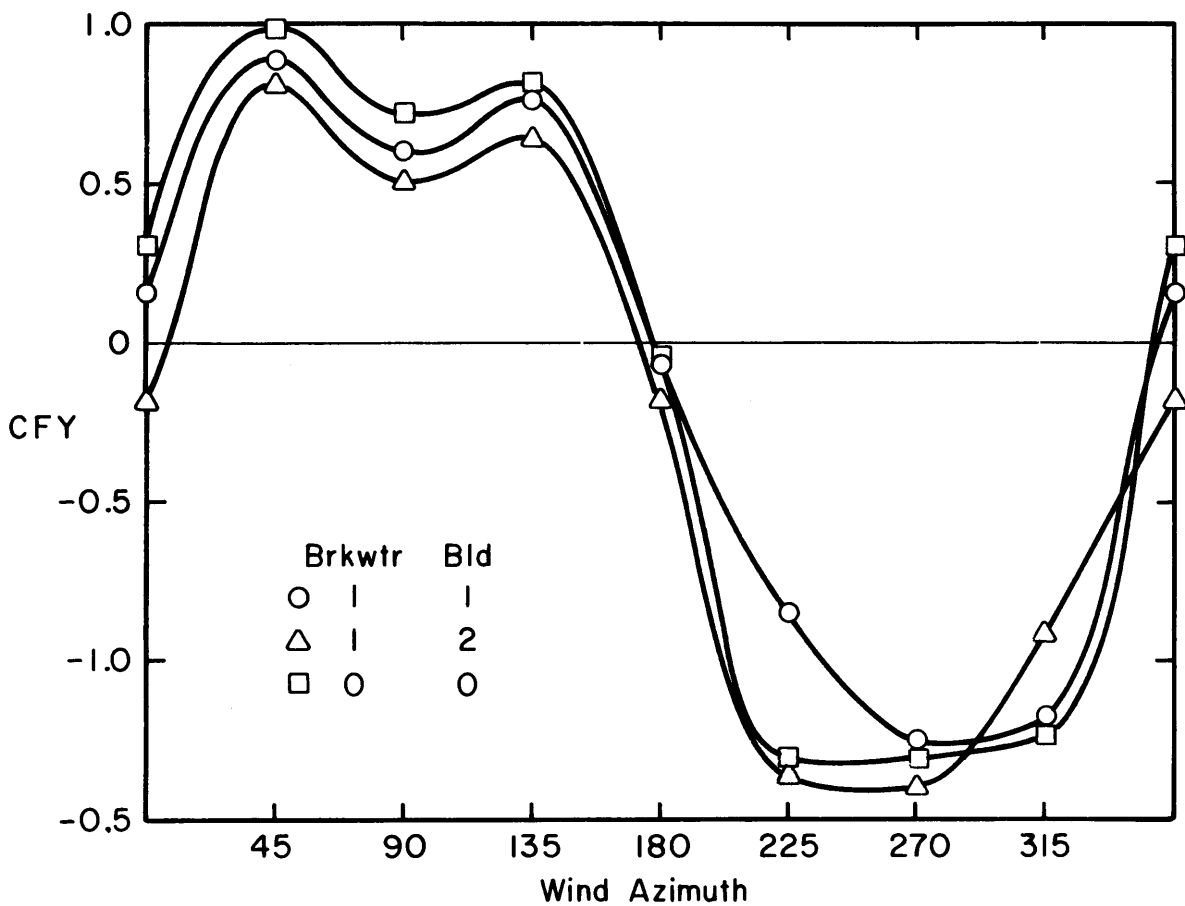
Fig. 6. Variation of CFY with Wind Azimuth.
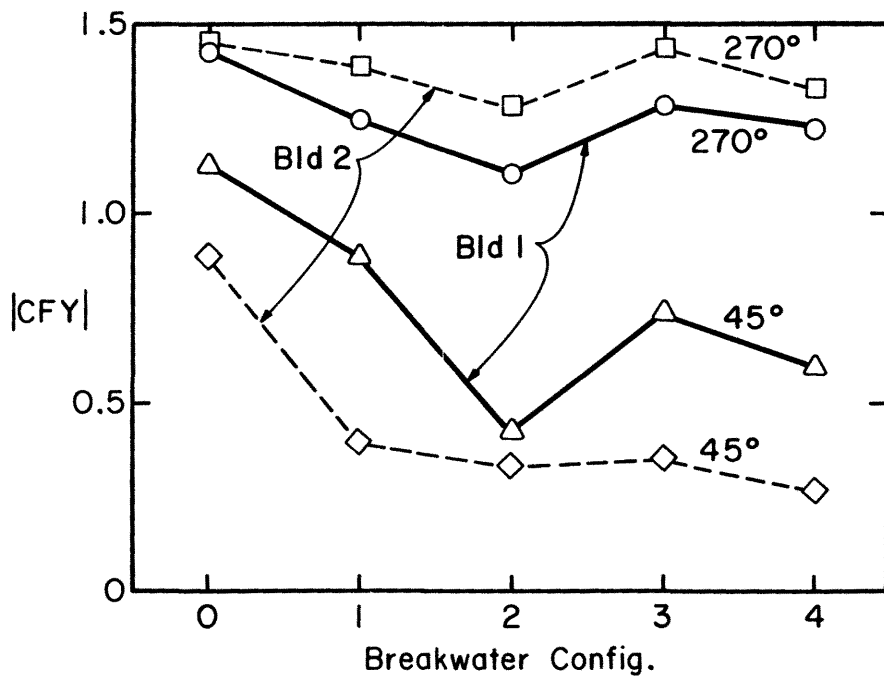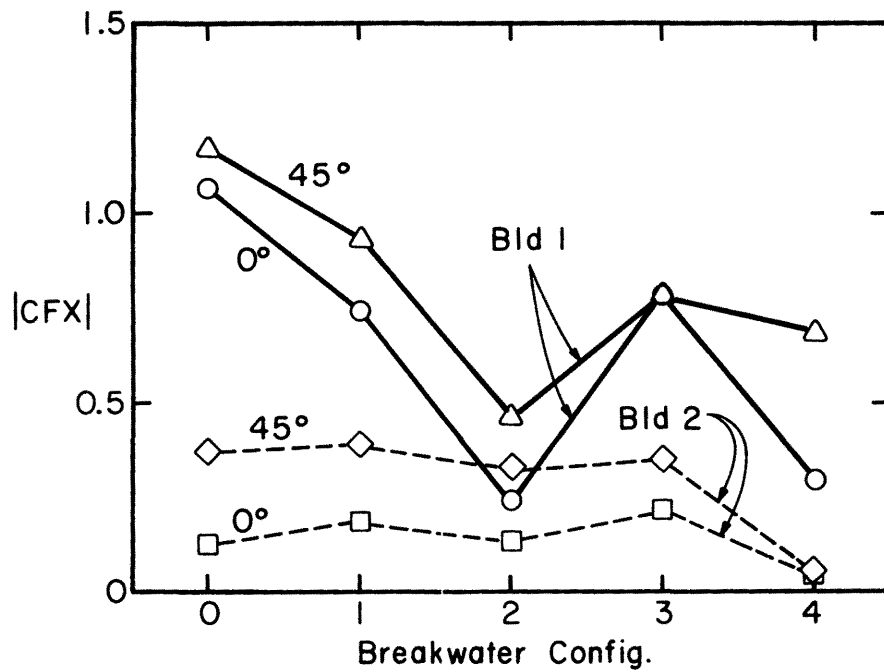
Fig. 7. Effect of Breakwaters on Force Coefficients.
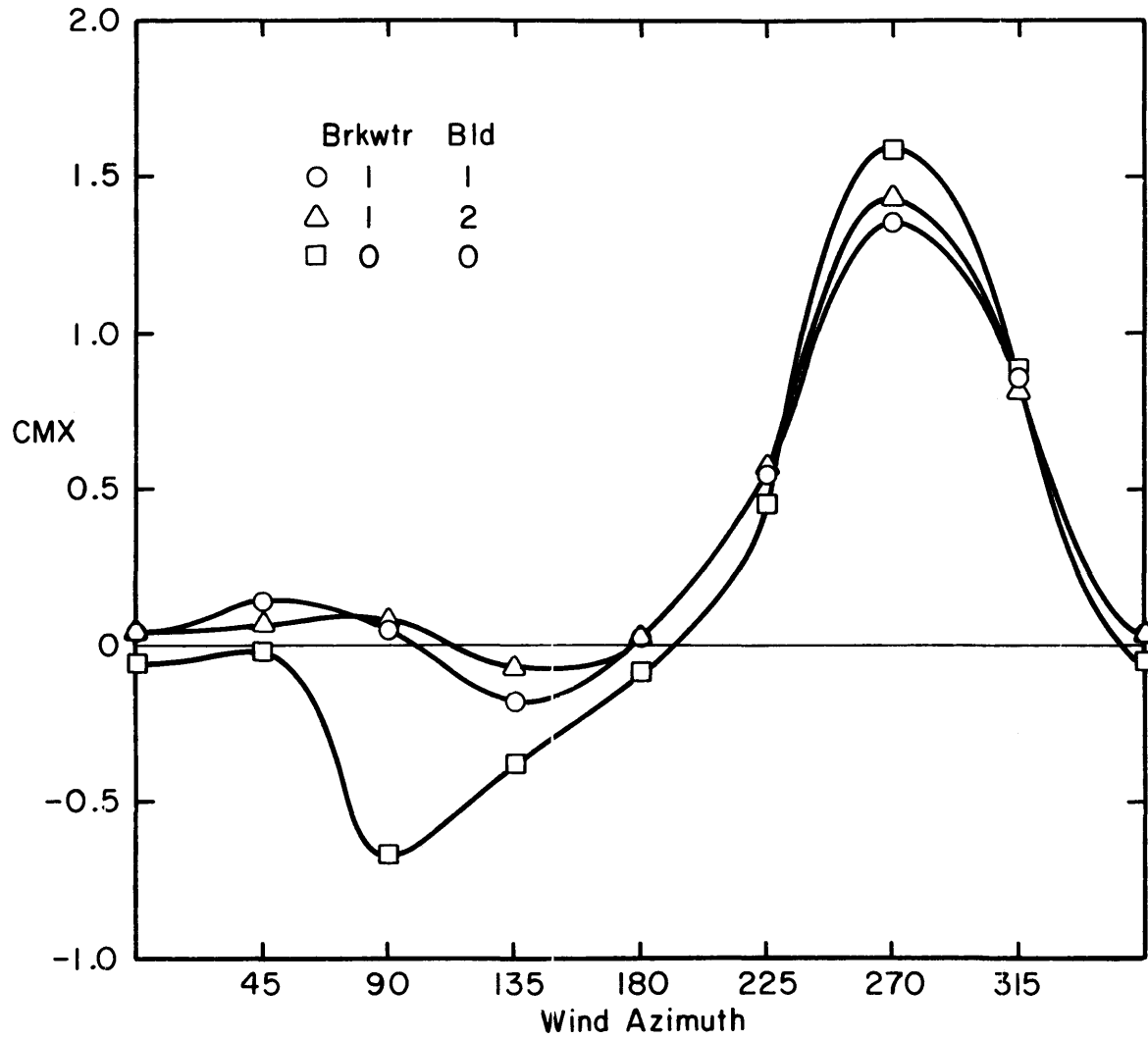
Fig. 8. Variation of CMX with Wind Azimuth.

APPENDIX A

Log of Television Tape Made in December 1975, of the Floating Nuclear Power Plant for Offshore Power Systems

Counter	Sequence Number	Run Number	Wind Direction	Wind Velocity fps	Source Number	Source Velocity fps	Notes
000	Heads						
009	1	1	000	35	A1	32	
096	2	2	045	35	A1	32	
118	3	3	090	35	A1	32	
135	4	4	135	35	A1	32	
148	5	5	180	35	A1	32	
164	6	6	225	35	A1	32	
176	7	7	270	35	A1	32	
193	8	8	315	35	A1	32	
210	9	9	000	35	A2	32	
225	10	10	045	35	A2	32	
241	11	11	090	35	A2	32	
257	12	12	135	35	A2	32	
269	13	13	180	35	A2	32	
283	14	14	225	35	A2	32	
299	15	15	270	35	A2	32	
319	16	15A	270	35	A2	32	Extended Turbine Bldg.
337	17	14A	225	35	A2	32	Extended Turbine Bldg.
351	18	6A	226	35	A1	32	Extended Turbine Bldg.
366	19	7A	270	35	A1	32	Extended Turbine Bldg.
380	20	7B	270	190	A1	32	Hurricane Winds
393	21	6B	225	190	A1	32	Hurricane Winds
404	22	6C	225	5	A1	32	Very Low Winds
414	23	7C	270	5	A1	32	Very Low Winds
425	24	7D	270	35	A1	32	Middle Ht. Penthouse
439	25	6D	225	35	A1	32	Middle Ht. Penthouse
451	26	6E	225	35	A1	32	Extended Penthouse
461	27	7E	270	35	A1	32	Extended Penthouse
474	28	7F	270	35	A1	32	Fence-300'
485	29	6F	225	35	A1	32	Fence-300'
497	30	6G	225	35	A1	32	No Penthouse
511	31	7G	270	35	A1	32	No Penthouse
522	32	8G	315	35	A1	32	No Penthouse
535	33	76	135	35	Ae 225	1500	Horizontal Jet (Loss of Grid)
551	34	75	090	35	Ae 225	1500	Horizontal Jet (Loss of Grid)
560	35	50	270	35	Relief Valves	1000	
566	36	51	270	35	Relief Valves	750	
573	37	52	270	35	Relief Valves	375	
578	38	53	270	5	Relief Valves	375	Very Low Winds
589	39	54	270	190	Relief Valves	1500	Hurricane
594	40	55	270	190	Relief Valves	1500-0	Hurricane-Declining Steam Flow
604	41	56	225	190	Relief Valves	1500-0	Hurricane-Declining Steam Flow
617	End						

Recording done on JVC Cassette Recorder Model CR-6000U. Since the counters are friction drive, numbers cannot be regarded as exact.

APPENDIX B

Conversion of Measured Concentrations in
lbm/ft^3 to Volumetric Fraction (ppm)

Assume steam is discharged at temperature $(T_{st})_i$ into dry air at temperature $(T_{ar})_i$. Let air and steam mix adiabatically and reach some final temperature and pressure, T_m and p_m.

Assume $(T_{ar})_i = 60°F \ (520°R)$

$$p_m = p_{st_m} + p_{ar_m} = 14.7 \text{ psia}$$

$$(T_{st})_i = 300°F \ (760°R)$$

Conservation of energy requires that if ρ_{st} is the mass of steam present/volume in final mixture and ρ_{ar} is the mass of air present/volume in final mixture at sample point then:

$$\rho_{st}(h_{st})_i + \rho_{ar}(h_{ar})_i = \rho_{st}(h_{st})_m + \rho_{ar}(h_{ar})_m$$

Where h is enthalpy in each case. If the partial pressure of the water vapor present in the final mixture is less than the vapor pressure of steam at the mixture temperature a simplification is possible such that

$$\rho_{st}c_{p_{st}}(T_{st})_i + \rho_{ar}c_{p_{ar}}(T_{ar})_i = \rho_{st}c_{p_{st}}(T)_m + \rho_{ar}c_{p_{ar}}(T)_m$$

where c_p is specific heat capacity in each case.

Since $p_m = (p_{st})_m + (p_{ar})_m$, and for ideal gases $p/\rho = \frac{RT}{M}$, then it is possible to write

$$A \ T_m^2 + BT_m + C = 0$$

where

$$A = \rho_{st}(c_{p_{st}} - \frac{M_{ar}}{M_{st}} c_{p_{ar}})$$

$$B = \rho_{st}(\frac{M_{ar}}{M_{st}} c_{p_{ar}} (T_{ar})_i - c_{p_{st}}(T_{st})_i) + \frac{M_{ar}P_m c_{p_{ar}}}{R}$$

$$C = - \frac{M_{ar}P_m c_{p_{ar}}(T_{ar})_i}{R}$$

Hence, one can solve directly for the final mixture temperature, and then from

$$(p_{st})_m = \frac{\rho_{st} R T_m}{M_{st}}$$

If this value is less than vapor pressure of steam at T_m one proceeds.*

$$(p_{ar})_m = p_m - (p_{st})_m$$

$$(\rho_{ar}) = \frac{(p_{ar})_m M_{ar}}{R T_m}$$

and finally, the mole or volume fraction becomes

$$x_{st} = \frac{\rho_{st}/M_{st}}{(\rho_{ar}/M_{ar} + \rho_{st}/M_{st})}$$

or in ppm

$$X_{st} = x_{st} \times 10^6 \text{ (ppm)}$$

For the results reported herein coefficient A is very small, therefore a convenient approximation is

$$T_m = \frac{-C}{B} \text{ (°R)}$$

The result is accurate to 0.5°R for $x_{st} < 300 \times 10^{-6}$ lbm/ft^3 which appears adequate considering other errors in the approach.

An even rougher approximation may be made if one lets $(p_{ar})_m = p_m$, and $x_{st} = \left[\rho_{st}/18 \right] / \left[\rho_{ar}/29. \right]$ These errors are somewhat self correcting such that final value may only be in error by less than one percent.

*If $(p_{st})_m$ is greater than the vapor pressure of steam at T_m then it is necessary to use steam tables to evaluate $(h_{st})_m$. Process becomes a trial and error iterative solution.

Thus, a final conversion formula (approximate) may be used. Considering errors associated with variability of background air temperature and humidity, it would appear adequate to utilize:

$$\chi_{st} \cong 21.17 \times 10^6 \, \rho_{st} \quad (\text{ppm}).$$

where ρ_{st} is expressed in units of (lbm/ft^3).

The value of ρ_{st} to be inserted in the above conversion formulae may be determined from the model data as follows:

Let Q_p = Source strength (lbm/sec)

V_p = Wind velocity at reference height (ft/sec)

ρ_{st} = Steam concentration at sample point (lbm/ft^3)

$\left(\dfrac{\chi V}{Q} \right)_p$ = Measured equivalent sample concentration (ft^{-2}) (See Table 5)

Thus

$$\rho_{st} = \frac{Q_p}{V_p} \left[\frac{\chi V}{Q} \right]_p = \boxed{} \quad \text{lbm/ft}^3$$

Example: Run 1: Q_p = 2576 lbm/sec

V_p = 35 ft/sec

Sample Port 1: $\left(\dfrac{\chi V}{Q} \right)_p = 359.6 \times 10^{-8} \text{ ft}^{-2}$

$$\rho_{st} = \frac{2576}{35} \, (359.6 \times 10^{-8}) = \boxed{265 \times 10^{-6} \text{ lbm/ft}^3}$$

$$\rho_{st} = (265 \times 10^{-6}) \times (21.17 \times 10^6) = \boxed{5603 \text{ ppm}}$$