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# Control Room x/Q Values for the Beaver Valley Power Station

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## Introduction

One of the important elements in determining the measure of protection afforded Duquesne Light Company's Beaver Valley Power Station (BVPS) control room occupants in the event of an accidental release of radionuclides is the characterization of the dispersion afforded a source within the building complex. These evaluations had previously been performed for BVPS using the generic methodology described by Murphy and Campe.[1] However, more recent analyses have been presented, the use of which shows an increase in the accuracy of dispersion calculations in the presence of building wake turbulence[2,3,4] when compared with field measurements made at other nuclear power plant. Building wake turbulence is an important dispersion mechanism in typical control room dose evaluations because of the postulated building-level release scenarios from site buildings and the corresponding receptor location at the control room.

The results of atmospheric dispersion calculations are typically reported as a normalized (i.e., unit source) concentration or x/Q, where x is the concentration at the receptor (typical units for a radionuclide release are curies/$m^3$) and Q is the release rate (e.g., curies/sec). The implied proportionality between receptor concentration and release rate at the source holds when the discharge flow is small when compared with the plume flow. Such is expected at the Beaver Valley site, wherein the natural atmospheric turbulence is enhanced by additional turbulent mixing around the site buildings.

## Previous Analysis

Control room x/Q values were previously calculated for both Units 1 and 2[5,6] using the methodology described by Murphy and Campe.[1] Releases were postulated from each of the top of the containment building, edge of the containment building, auxiliary building, main steam valve house, service building, turbine building, and gaseous waste storage tank vault. Accident periods of 0-8, 8-24, 24-96 (1-4 days), and 96-720 (4-30 days) hours were simulated. The x/Q values reported were calculated to encompass 95 percent of the meteorological conditions (i.e., that are exceeded for only 5 percent of the meteorological conditions). Wind speeds were chosen which were exceeded for only 5 percent of the meteorological record; stability class G was then assumed for conservatism.

Tables 1 and 2 give the results of this analysis. It should be noted that these values include factors for the fraction of time that an operator would be in the plant vicinity. Although this usage factor could, perhaps, be more appropriately included in calculating operator dose from the surrounding radionuclide concentration, it is included with x/Q calculations in Reference 1.

## Recent Calculational Advances

A series of reports and papers by J. V. Ramsdell, Jr. considered the methodology of Murphy and Campe and proposed new methodologies to improve the predictive capabilities of calculations of atmospheric dispersion in the presence of building wakes. The first of these reports[2] made use of seven field experiments to illustrate that the Murphy and Campe methodology accounted for little of the variability in concentrations affected by building wakes. An empirical model was proposed that showed a significant improvement in predicting centerline concentrations. The model is a multiple-linear regression (linear in a log-log sense) that relates downwind distance, building cross-sectional area, wind velocity, and stability class to x/Q. Because circulation in building wakes distributes effluents entering the wake more widely than normal atmospheric diffusion, it was also recommended that relatively wide wind-direction sectors (perhaps as wide as 90°) be used in applying the methodology to evaluating concentrations affected by these wakes.

The second of these reports[3] generalized the statistical model into one that had comparable accuracy but had its basis in the physical mechanisms of importance. It was noted that this model does not result in building wake effects on concentrations very near the source; but the presence of buildings becomes important in controlling the transition from wake to normal diffusion. The concentrations near the source are seen to be directly related to wind speed, rather than the inverse relationship of previous models. It also shows that building wake effects are important at greater downwind distances than indicated by previous calculational models. These characteristics are borne out by the empirical analysis.

Table 1
Design Basis (Exceeds 95% of) x/Q Values ($sec/m^3$) at the
BVPS Control Room Intake for Postulated
Release Points Using Murphy-Campe Methodology
(Previous Analysis)[5] - Unit 1

| Release Point | Accident Period | | | |
|---|---|---|---|---|
| | 0-8 Hours | 8-24 Hours | 1-4 Days | 4-30 Days |
| Containment Building Edge | 2.88E-3 | 1.90E-3 | 6.62E-4 | 1.41E-4 |
| Containment Building Top | 2.51E-3 | 1.66E-3 | 5.77E-4 | 1.23E-4 |
| Auxiliary Building | 8.24E-3 | 6.01E-3 | 2.32E-3 | 6.18E-4 |
| Main Steam Valve | 2.97E-3 | 1.94E-3 | 6.92E-4 | 1.54E-4 |
| Service Building | 7.47E-3 | 5.09E-3 | 1.88E-3 | 4.93E-4 |
| Turbine Building | 7.81E-3 | 5.55E-3 | 2.11E-3 | 7.11E-4 |
| Gaseous Waste Storage Vault | 2.03E-2 | 1.51E-2 | 5.99E-3 | 1.32E-3 |

Table 2
Design Basis (Exceeds 95% of) x/Q Values ($sec/m^3$) at the
BVPS Control Room Intake for Postulated
Release Points Using Murphy-Campe Methodology
(Previous Analysis)[6] - Unit 2

| Release Point | Accident Period | | | |
|---|---|---|---|---|
| | 0-8 Hours | 8-24 Hours | 1-4 Days | 4-30 Days |
| Containment Building Edge | 4.16E-3 | 2.81E-3 | 1.09E-3 | 1.58E-4 |
| Containment Building Top | 3.65E-3 | 2.47E-3 | 9.56E-4 | 1.39E-4 |
| Auxiliary Building | 1.33E-2 | 9.30E-3 | 3.94E-3 | 1.20E-3 |
| Main Steam Valve | 7.75E-3 | 5.63E-3 | 1.99E-3 | 3.26E-4 |
| Service Building | 5.42E-3 | 3.62E-3 | 1.43E-3 | 3.31E-4 |
| Turbine Building | 6.46E-3 | 4.90E-3 | 2.00E-3 | 5.75E-4 |
| Gaseous Waste Storage Vault | 1.23E-1 | 1.04E-1 | 5.08E-2 | 2.00E-2 |

The third report[4] further refines the theoretical framework for describing building wake diffusion and extends the application to ground level, roof-top vent, short stack, and elevated releases. This latter report also presents guidance in implementing the model.

The model, as applied to the Beaver Valley site, is an extension of the standard Gaussian plume model for ground-level releases:

$$\frac{X}{Q} = \frac{1}{U\pi\Sigma_y\Sigma_z} \qquad (1)$$

where:

- $X$ = plume centerline concentration, ci/m$^3$
- $Q$ = release rate ci/sec
- $U$ = wind speed, m/sec
- $\Sigma_y$ = horizontal wake and natural turbulent diffusion coefficient, m
- $\Sigma_z$ = vertical wake and natural turbulent diffusion coefficient, m

The wake and natural turbulent diffusion coefficients are a combination of the two mechanisms such that:

$$\Sigma^2 = \sigma_w^2 + \sigma^2 \qquad (2)$$

where:

- $\Sigma$ = wake and natural turbulent diffusion coefficients (horizontal, $\Sigma_y$ or vertical, $\Sigma_z$), m
- $\sigma_w$ = wake component of diffusion coefficients (horizontal, $\sigma_{yw}$ or vertical, $\sigma_{zw}$), m
- $\sigma$ = natural turbulence component of diffusion coefficients (horizontal, $\sigma_y$ or vertical, $\sigma_z$), m

Standard methods of estimation $\sigma$[7] are applicable to the present model. The wake component of the diffusion coefficients is described as:

$$\sigma_w^2 = \frac{KA}{.0076U^2s^2}\left[1-\left(1+.0869\frac{sd}{A^{1/3}}\right)\exp\left(-.0869\frac{sd}{A^{1/3}}\right)\right] \qquad (3)$$

where:

K = a dimensional constant, 0.5 $m^2/sec^2$

A = projected building cross sectional area, $m^2$

S = 1 for horizontal wake component, stability parameter for vertical wake component (= stability class, where class A=1, B=2,....)

d = distance from the release point to the receptor location, m

The constant K is actually a combination of several terms in the theoretical model, which cannot be easily evaluated with readily-available meteorological data. A value of 0.5 was chosen by Ramsdell so that the model gave an unbiased representation of the data he had available. The stability parameter used in the description of the vertical wake component, S, was shown to be well represented by the square root of the stability class.[3]

Equation 3, as presented above, differs from the equations contained in Reference 4. The latter contains typographical errors[8], which are corrected here.

Model Application

The model presented above is applicable to a release from which the plume will be entrained in the building wake. Such releases include those at ground-level as well as some from roof-top vents. Roof-top vent releases are simulated using a weighting factor, which describes the portion of the plume entrained in the building wake; the remainder of the plume is taken to be described as an elevated release.[4,9] The factor is a function of the ratio of vertical release velocity and wind speed. For ratios less than one, the plume is taken to be entirely within the building wake; for ratios greater than 5, the plume is taken to be elevated entirely above the building wake. For the postulated accident releases at Beaver Valley, this ratio was taken to be less than 1 (i.e , low velocity releases). It is expected that, for the relatively short release-receptor distances analyzed for Beaver Valley (95 meters maximum), such low velocity (ground-level model) releases would yield larger receptor concentrations than would elevated releases. Indeed, Ramsdell indicates that, "near the source, the concentrations from roof-top releases are lower than concentrations from ground-level releases."[4]

Equations 1 to 3 represent the concentration at the plume centerline. Calculation of time-varying short-term (i.e., invariant meteorology) concentrations can be achieved by applying these equations and calculating the off-centerline concentrations according to a normal (Gaussian) distribution. An alternative and somewhat more conservative approach, at least insofar as establishing extreme conditions is concerned, is to assume that, if the wind direction is reasonably close to the direction from the source to the receptor, then the plume centerline passes over the receptor. This latter calculational interpretation would also account for the fact that, once in the turbulent building wake, the plume centerline position is uncertain.

This "window" was taken to be 30° to either side of the receptor for a total effective centerline width of 60°. That is, if the wind direction is within 30° of the direction from the source to the receptor, then, for short-term (e.g., averaging periods of 8 hours or less) concentrations, the receptor location is taken to be directly along the plume centerline. For long-term (e.g., averaging periods of 24 hours or more) concentrations, it is unreasonable to expect the receptor to be continuously along the plume centerline, even if the wind direction is within the window. In this case, the effects of building wake and natural plume meander would result in a plume or sector cross-sectional average type concentration at the receptor.

The long-term average plume concentration at the receptor can be derived from Equation 1 if a Gaussian distribution is assumed normal to the centerline, so that:

$$(\chi/Q)_{long\ term} = \frac{\int_{-\infty}^{\infty} \frac{1}{\pi U \Sigma_y \Sigma_z} \exp\left(\frac{-y^2}{2\Sigma_y^2}\right) dy}{W} \qquad (4)$$

where:

y = lateral distance from the plume centerline, m

W = width over which the plume is assumed to be evenly spread, m

Equation 4 is the mathematical equivalent of taking the entire lateral cross-section of the plume (i.e., contaminant content of the plume) and determining the concentration if it were spread evenly over the width, W. Given that:[10]

$$\int_0^{\infty} e^{-t^2} dt = \frac{\sqrt{\pi}}{2} \tag{5}$$

then Equation 4 reduces to:

$$(\chi/Q)_{long\ term} = \frac{\sqrt{2}}{\pi} \frac{1}{U\Sigma_z W} \tag{6}$$

The average concentration across the width of the plume (the width is taken as $\pm 2\Sigma_y$ or 4 standard deviations, within which 95 percent of the source is contained) is then:

$$(\chi/Q)_{x\text{-}Sect.\ Avg} = \frac{1}{U\Sigma_y \Sigma_z \sqrt{8\pi}} \tag{7}$$

However, a minimum long-term width over which the plume is averaged can be envisioned as one wind-direction sector (1/16 of a circle, or $2\pi d/16$ meters) so that:

$$(\chi/Q)_{long\ term} = minimum\ of \frac{1}{U\Sigma_y \Sigma_z \sqrt{8\pi}}, \frac{16}{dU\Sigma_z \sqrt{2\pi^3}} \tag{8}$$

The short-term x/Q averaging periods (e.g., 8 hours or less) assume that all of the hourly meteorological data (i.e., wind speed, wind direction, and stability class) is available. If any of the data are missing, then x/Q values for periods containing the missing data are not calculated. For the long-term x/Q averaging periods (e.g., 24 hours or more) on the other hand, 3/4 of the hours contained within a period must be available for a calculation to be viable. This is an extension of EPA guidance,[11] which allow up to 6 missing hours in any 24-hour period for the calculation of air quality parameters.

## Model Results

The above-described model was applied to postulated accident releases at the Beaver Valley Power Station Units 1 and 2 in order to calculate design basis control room x/Q values.

On-site meteorological data for the 5-year period of 1986 through 1990[12] were applied along with the physical parameters (building cross-sectional area, direction from source to control room) appropriate for each of the 14 release points (7 for each unit).[5,6] Figure 1 illustrates the relative location of the release points and the control room; Table 3 gives the values of the physical parameters associated with each release point.

Averaging periods of 8, 24, 72, and 624 hours were considered. Although, as discussed previously, each of the latter 3 periods could have contained x/Q values with up to 6, 18, and 156 missing hours of data, respectively, the actual maximum number of missing hours imbedded in these averages were 6, 18, and 45, respectively. Only one percent of the individual hourly data contained any missing data.

Sequential x/Q values were simulated for the period of record and frequencies of occurrence of these values calculated. The cumulative frequency distributions for all of the 14 release scenarios are included in the appendix to this report.

Tables 4 and 5 contain the design basis x/Q values (exceeded only 5 percent of the time) for Units 1 and 2, respectively. Comparison of these tables with Tables 1 and 2 illustrates that the more recent methodology[4] leads to 8-hour average x/Q estimates from 1.4 (Unit 2 Gaseous Waste Storage Vault) to 52 percent (Unit 1 Auxiliary Building) of those using the preceding methodology.[1] Inspection of the tables also reveals that x/Q values decrease more rapidly as the averaging period increases for the prior methodology than they do for the present one. This is due, at least in part, to the fact that the former values (Murphy-Campe methodology) include a usage factor that simulates the fraction of time an operator would be within the plant boundaries. If this factor (0.4 for 624-hour average) is removed from the Table 1 and 2 calculations, then the methodology of Ramsdell[4] is seen to be lower than that of Murphy-Campe[1] by

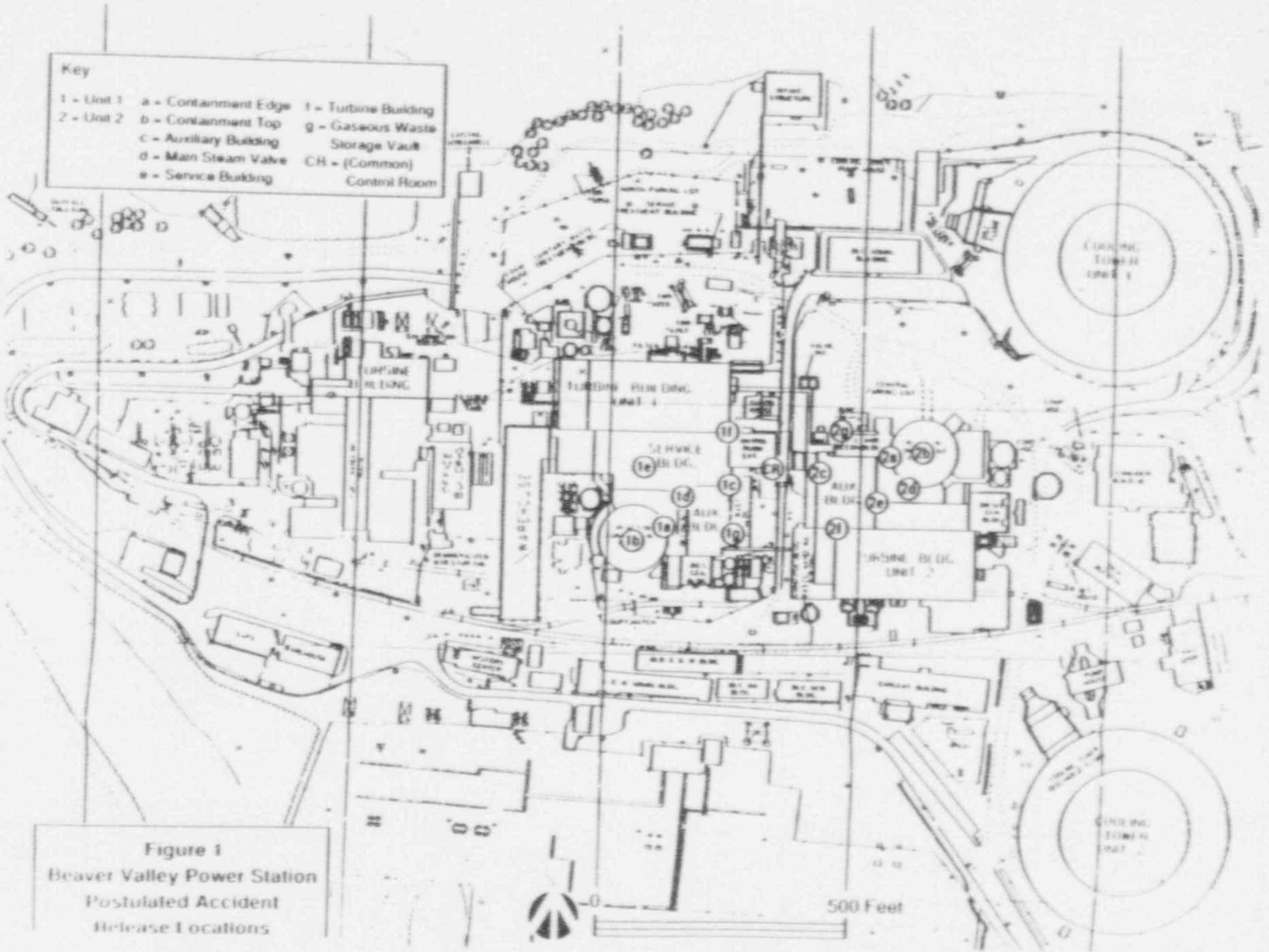


Figure 1
Beaver Valley Power Station
Postulated Accident
Release Locations

Table 3
Physical Parameter Values Used to Calculate
Design Basis x/Q Values for Various Release Points

| Release Point | Building Cross-Sectional Area ($m^2$) | Direction from Release to Control Room (deg) | Distance to Control Room (m) |
|---|---|---|---|
| **Unit 1** | | | |
| Containment Building Edge | 1600 | 203 | 72 |
| Containment Building Top | 1600 | 203 | 93 |
| Auxiliary Building | 1600 | 217 | 24 |
| Main Steam Valve | 1600 | 212 | 56 |
| Service Building | 627 | 231 | 75 |
| Turbine Building | 1844 | 273 | 34 |
| Gaseous Waste Storage Vault | 343 | 163 | 46 |
| **Unit 2** | | | |
| Containment Building Edge | 1600 | 46 | 74 |
| Containment Building Top | 1600 | 46 | 95 |
| Auxiliary Building | 2094 | 52 | 30 |
| Main Steam Valve | 931 | 62 | 86 |
| Service Building | 2191 | 70 | 69 |
| Turbine Building | 2888 | 93.5 | 56 |
| Gaseous Waste Storage Vault* | 10.2 | 52 | 61 |

*Postulated from the vault exit door, which is in a vestibule. It is assumed, for this release only, that the "window" is ±90°. For all other releases, the window is ±30°.

Table 4
Design Basis (Exceeds 95% of) x/Q Values ($sec/m^3$) at the
BVPS Control Room Intake for Postulated
Release Points Using Ramsdell Methodology
(New Analysis)[4] - Unit 1

| Release Point | Accident Period | | | |
|---|---|---|---|---|
| | 0-8 Hours | 8-24 Hours | 1-4 Days | 4-30 Days |
| Containment Building Edge | 4.33E-4 | 2.04E-4 | 1.46E-4 | 8.84E-5 |
| Containment Building Top | 2.73E-4 | 1.28E-4 | 9.17E-5 | 5.57E-5 |
| Auxiliary Building | 4.30E-3 | 2.01E-3 | 1.49E-3 | 9.25E-4 |
| Main Steam Valve | 7.60E-4 | 3.51E-4 | 2.59E-4 | 1.58E-4 |
| Service Building | 6.25E-4 | 3.04E-4 | 2.36E-4 | 1.57E-4 |
| Turbine Building | 2.43E-3 | 1.22E-3 | 8.90E-4 | 6.26E-4 |
| Gaseous Waste Storage Vault | 5.11E-4 | 2.15E-4 | 1.65E-4 | 1.14E-4 |

Table 5
Design Basis (Exceeds 95% of) x/Q Values ($sec/m^3$) at the
BVPS Control Room Intake for Postulated
Release Points Using Ramsdell Methodology
(New Analysis)[4] - Unit 2

| Release Point | Accident Period | | | |
|---|---|---|---|---|
| | 0-8 Hours | 8-24 Hours | 1-4 Days | 4-30 Days |
| Containment Building Edge | 1.88E-4 | 9.32E-5 | 7.06E-5 | 4.18E-5 |
| Containment Building Top | 1.20E-4 | 5.91E-5 | 4.45E-5 | 2.64E-5 |
| Auxiliary Building | 1.04E-3 | 5.15E-4 | 4.04E-4 | 2.46E-4 |
| Main Steam Valve | 1.59E-4 | 7.86E-5 | 5.96E-5 | 3.76E-5 |
| Service Building | 2.21E-4 | 1.11E-4 | 8.51E-5 | 5.17E-5 |
| Turbine Building | 2.72E-4 | 1.43E-4 | 1.10E-4 | 6.30E-5 |
| Gaseous Waste Storage Vault | 1.74E-3 | 9.36E-4 | 7.69E-4 | 5.55E-4 |

factors of from 1.1 to 60 percent for the 624-hour averages, a range similar to that for the 8-hour average.

Sensitivity Analysis

The physical parameters corresponding to the containment building edge (see Table 3) were used as the basis for a sensitivity study of the above-described results. Besides analyzing the sensitivity of the design basis (x/Q exceeded 5 percent of the time) results to changes in the physical parameters, variations in the size of the "window" in the method of calculating long-term averages (i.e., the lateral averaging interval), and in the assumption of a point source are considered.

Table 6 gives some of the results of the sensitivity study. A change in the direction from the source to the receptor, the control room, of ±3° (from 203°) results in a change in calculated x/Q of approximately 7 percent. This change is a function of the directional distribution of the wind speeds and stability classes at Beaver Valley; it is indicative that inspection of the near-surface onsite distribution[12] shows wind frequencies increasing from 180° (S) around to 225° (SW). A change in the distance from the source to the receptor of ±3 meters (out of 72 meters) results in a change in x/Q of approximately 8 percent, with the concentrations decreasing (as expected for nonelevated releases) as the distances increase. The effect of changing building cross-sectional area over the range of ±50$m^2$ (out of 1600$m^2$) is seen to be negligible. All of these changes are independent of averaging periods.

The analysis of x/Q in this report used a value of ±30° for the "window." That is, if the wind direction is within 30° of the direction from the source to the receptor, then the plume centerline is taken to pass over the receptor; outside of this window, the plume is taken not to effect the receptor. In terms of defining extreme circumstances (e.g., x/Q exceeded 5 percent of the time), this is a reasonable conceptualization. Plumes outside of the window, although possibly affecting the receptor, will have small (off-centerline) concentrations at the receptor; they, therefore, will not define extreme conditions. If this window were increased to, for example, ±45° (i.e., winds blowing from an entire quadrant would result in the centerline passing over the control room), then 8-

Table 5
Sensitivity of Containment Building Edge
Design Basis (Exceeds 95% of) x/Q Values (sec/$m^3$) at the
BVPS Control Room Intake to Changes in Parameter Values

| Sensivity to | Accident Period 0-8 Hours | 8-24 Hours | 1-4 Days | 4-30 Days |
|---|---|---|---|---|
| Direction from source to receptor, ° | | | | |
| 200 | 4.09E-4 | 1.92E-4 | 1.38E-4 | 8.34E-5 |
| 203 | 4.33E-4 | 2.04E-4 | 1.46E-4 | 8.84E-5 |
| 206 | 4.62E-4 | 2.16E-4 | 1.55E-4 | 9.48E-5 |
| Distance from source to receptor, m | | | | |
| 69 | 4.68E-4 | 2.21E-4 | 1.58E-4 | 9.55E-5 |
| 72 | 4.33E-4 | 2.04E-4 | 1.46E-4 | 8.84E-5 |
| 75 | 4.02E-4 | 1.89E-4 | 1.36E-4 | 8.19E-5 |
| Building cross-sectional area, $m^2$ | | | | |
| 1550 | 4.34E-4 | 2.04E-4 | 1.47E-4 | 8.86E-5 |
| 1600 | 4.33E-4 | 2.04E-4 | 1.46E-4 | 8.84E-5 |
| 1650 | 4.32E-4 | 2.03E-4 | 1.46E-4 | 8.83E-5 |
| Window, ±° | | | | |
| 15 | 2.44E-4 | 1.12E-4 | 7.73E-5 | 4.56E-5 |
| 30 | 4.33E-4 | 2.04E-4 | 1.46E-4 | 8.84E-5 |
| 45 | 5.87E-4 | 2.83E-4 | 2.11E-4 | 1.37E-4 |
| Long-term averaging width, m | | | | |
| 30° window | 4.33E-4 | 3.53E-4 | 2.63E-4 | 1.71E-4 |
| 22.5° sector (max.conc = centerline conc.) | 4.33E-4 | 3.15E-4 | 2.27E-4 | 1.37E-4 |
| Gaussian distribution | 2.37E-4 | 1.80E-4 | 1.32E-4 | 8.92E-5 |
| Width of (line) source, m | | | | |
| 0 | 4.33E-4 | -- | -- | -- |
| 20 | 4.00E-4 | -- | -- | -- |
| 40 | 3.27E-4 | -- | -- | -- |
| Discharge flowrate, $m^3$/sec | | | | |
| 0 | 4.33E-4 | -- | -- | -- |
| 50 | 4.21E-4 | -- | -- | -- |
| 100 | 4.07E-4 | -- | -- | -- |

hour average x/Q values would increase by 36 percent, while 624-hour average values would increase by 55 percent. As the averaging period increases, more hourly values will be nonzero, leading to larger increases in these values relative to those of the shorter averaging periods (whose extremes already reflect all, or nearly all, nonzero x/Qs).

The long-term average calculations took the plume meander into effect and assumed that the receptor saw an average (across the plume) concentration, with a minimum averaging width of one wind sector (22.5°). Alternative methods of accounting for long-term averaging were investigated. These analyses, the results of which are included in Table 6, consisted of taking an averaging width (i.e., W in Equation 4) corresponding to the "window," an averaging width corresponding to a 22.5° wind sector (with a maximum value of the plume centerline value as calculated by Equation 1), and applying a Gaussian distribution in the lateral direction (with no window). An averaging width corresponding to the window of 30° results in an increase of a factor of about 1.8 from the methodology described by Equation 8. Reducing the averaging width to 22.5° would increase the calculated x/Q (spreading the plume over a narrower width) but, if allowance is made for the times when the calculated average is greater than the centerline x/Q, then an increase of a factor of about 1.5 from the methodology used to produce Tables 4 and 5 (Equation 8) is seen. Note that, for these first 2 cases, the 8-hour average values do not change since the latter are based on centerline rather than width-averaged values.

On the other hand, if the off-centerline concentrations, as given by the Gaussian distribution in the lateral direction, are considered, then the 8-hour averages could be recalculated as well. Table 6 indicates that such averages are about 0.5 of those used previously in this analysis. For longer averaging periods, the Gaussian distribution averages are close to those calculated using Equation 8, the ratio of the two increasing from about 0.9 (for 24-hour average) to 1.0 (for 624-hour average). This slight increase indicates that, as the averaging period gets longer, the effects of using the "window" as a cutoff are less conservative (but still reasonable).

The use of a Gaussian distribution, as above, implies a straight-line trajectory (no meandering within the measuring period of 1 hour). It implies a point source (as described by Equation 1) about which the atmospheric dispersion results in

such a distribution; it also implies a zero discharge flow rate. At relatively large distances from the source, where the plume flow is much greater than the discharge flow and the plume cross-section is much larger than the cross-section of the source, the assumption of a zero flow point release is valid. Closer to the source, the characteristics of the method of entry into the atmosphere are important. Ramsdell[4] accounts for the discharge flow rate by introducing a term, $F_o$, to the denominator of Equation 1 such that the plume concentration at the release point is correct. The analysis presented in this report assumes that $F_o$ is small compared to the atmospheric dilution flow at the control room. Table 6 includes the effect of assuming an initial dilution (discharge flow rate of 50 and 100 $m^3$/sec) for the 8 hour average design basis x/Q (the long-term averages were not evaluated with a nonzero $F_o$ because this latter term was not included in the derivation of the plume width-averaged x/Q [see Equation 4]). The assumption of a 100 $m^3$/sec discharge flow would decrease the design basis x/Q at the control room by 6 percent.

Table 6 also includes the sensitivity of the 8-hour average design basis x/Q values to the assumption of a point release. (The long-term plume width-averaged values are not included; they are based on integrating the plume contents and, therefore, will be insensitive to the shape of the discharge.) Horizontal line sources, simulated by a series of point sources, of 20 and 40 meters were investigated. A source width of 40 meters would decrease the calculated x/Q by 24 percent.

## Summary and Conclusions

Recent theoretical advances[2,3,4] allow for more accurate simulation of atmospheric dispersion in the presence of building wake turbulence than was previously possible. These advances were used, together with 5 years of hourly meteorological data from the Beaver Valley Power Station to calculate a sequential record of control room x/Q values associated with 14 release scenarios, 7 from each of the 2 units on site. Frequencies were derived from this sequential record in order to simulate cumulative distributions for accident periods ranging from 0-8 hours to 4-30 days. Design basis x/Q values, which surpass 95 percent of the sequential averages for each scenario, are presented in Tables 4 and 5. 0-8-hour design basis x/Q values at the control room range from 1.20E-4 (release from top of Unit 2 Containment Building) to 4.30E-3 sec/$m^3$

(release from Unit 1 Auxiliary Building). The corresponding 4-30-day design basis x/Q values at the control room range from 2.64E-5 to 9.25E-4 sec/$m^3$. The 8-hour average x/Q values are from 1.4 to 52 percent of those calculated previously[5,6] (using an older, less accurate methodology). Similar differences between the 2 analyses are found for the longer averaging times, provided that allowance is made for the fact that the older calculations implicitly include a usage factor, while those presented in this report do not.

A sensitivity analysis of the calculations presented herein is also included. It is shown that the x/Q values are relatively insensitive to changes in parameter selection; the maximum difference from the x/Q values presented in this report for the range of parameters investigated was less than a factor of two.

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9. U.S. Nuclear Regulatory Commission, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light Water Cooled Reactors," Regulatory Guide 1.111, 1977.

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11. U.S. Environmental Protection Agency, "On-Site Meteorological Program Guidance for Regulatory Modeling Applications, "EPA-450/4-87-013, 1987.

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# APPENDIX A

Cumulative Frequency Distributions of
Control x/Q Values Associated with
Each of the 14 Release Scenarios for the
Beaver Valley Power Station

APPENDIX A1

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from the Edge of the
Unit 1 Containment Building of the
Beaver Valley Power Station

*** CODE CLAIMCHI - CONTAINMENT BUILDING ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN1.INP
MET DATA FILE NAME: METDATA2.MET
THIS FILE NAME: CONTBLDG.CHI

**********
CHI/Q AT CONTAINMENT BUILDING EDGE (MAIN)
**********

BUILDING X-SECT AREA (M**2)= 1.600E+04
RECEPTOR -- DIRECTION (DEG)= 203.00 -- DISTANCE (MI)= 2.00E+00
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 90.0
VERTICAL DISTANCE OVER WHICH DELTA-TS ARE MEASURED IN MET FILE (M)= 55.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y  O F  E X C E E D I N G  G I V E N  C H I / Q
F O R  V A R I O U S  A V E R A G I N G  P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 6.915E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 4.610E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 1.360E-03 | 1.664E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 1.095E-02 | 9.032E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 1.876E-02 | 1.902E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 2.752E-02 | 3.637E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 3.573E-02 | 5.918E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 4.479E-02 | 9.270E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 5.299E-02 | 1.438E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 6.274E-02 | 1.949E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 7.155E-02 | 2.548E-02 | 1.151E-04 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 7.897E-02 | 3.297E-02 | 3.223E-04 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 8.658E-02 | 4.155E-02 | 8.057E-04 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 9.520E-02 | 5.003E-02 | 9.898E-04 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 1.040E-01 | 6.028E-02 | 2.049E-03 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 1.114E-01 | 7.112E-02 | 2.831E-03 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 1.177E-01 | 8.069E-02 | 4.213E-03 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 1.286E-01 | 9.115E-02 | 6.653E-03 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 1.394E-01 | 1.021E-01 | 9.392E-03 | 9.191E-05 | 0.000E+00 |
| 2.848E-04 | 1.455E-01 | 1.131E-01 | 1.310E-02 | 7.123E-04 | 0.000E+00 |
| 2.656E-04 | 1.514E-01 | 1.234E-01 | 1.869E-02 | 2.481E-03 | 0.000E+00 |
| 2.477E-04 | 1.561E-01 | 1.331E-01 | 2.511E-02 | 4.320E-03 | 0.000E+00 |
| 2.310E-04 | 1.611E-01 | 1.443E-01 | 3.340E-02 | 5.491E-03 | 0.000E+00 |
| 2.154E-04 | 1.639E-01 | 1.552E-01 | 4.187E-02 | 6.939E-03 | 0.000E+00 |
| 2.009E-04 | 1.669E-01 | 1.656E-01 | 5.221E-02 | 1.048E-02 | 0.000E+00 |
| 1.874E-04 | 1.697E-01 | 1.781E-01 | 6.284E-02 | 1.597E-02 | 0.000E+00 |
| 1.748E-04 | 1.729E-01 | 1.888E-01 | 7.596E-02 | 2.259E-02 | 0.000E+00 |
| 1.630E-04 | 1.756E-01 | 1.988E-01 | 8.800E-02 | 3.077E-02 | 0.000E+00 |
| 1.520E-04 | 1.783E-01 | 2.103E-01 | 1.005E-01 | 4.221E-02 | 0.000E+00 |
| 1.417E-04 | 1.805E-01 | 2.201E-01 | 1.170E-01 | 5.629E-02 | 0.000E+00 |
| 1.322E-04 | 1.811E-01 | 2.309E-01 | 1.306E-01 | 7.348E-02 | 0.000E+00 |
| 1.233E-04 | 1.828E-01 | 2.410E-01 | 1.484E-01 | 8.917E-02 | 0.000E+00 |
| 1.150E-04 | 1.845E-01 | 2.527E-01 | 1.642E-01 | 1.106E-01 | 1.157E-04 |
| 1.072E-04 | 1.845E-01 | 2.639E-01 | 1.827E-01 | 1.377E-01 | 3.148E-03 |
| 1.000E-04 | 1.858E-01 | 2.752E-01 | 1.986E-01 | 1.623E-01 | 6.921E-03 |
| 9.326E-05 | 1.858E-01 | 2.867E-01 | 2.146E-01 | 1.872E-01 | 2.032E-02 |
| 8.697E-05 | 1.867E-01 | 2.961E-01 | 2.316E-01 | 2.145E-01 | 5.923E-02 |
| 8.111E-05 | 1.867E-01 | 3.091E-01 | 2.508E-01 | 2.409E-01 | 1.045E-01 |
| 7.565E-05 | 1.871E-01 | 3.187E-01 | 2.684E-01 | 2.692E-01 | 1.578E-01 |
| 7.055E-05 | 1.871E-01 | 3.320E-01 | 2.852E-01 | 2.989E-01 | 2.212E-01 |
| 6.579E-05 | 1.871E-01 | 3.416E-01 | 3.029E-01 | 3.288E-01 | 3.110E-01 |
| 6.136E-05 | 1.871E-01 | 3.507E-01 | 3.213E-01 | 3.625E-01 | 3.845E-01 |
| 5.722E-05 | 1.871E-01 | 3.582E-01 | 3.405E-01 | 3.913E-01 | 4.574E-01 |
| 5.337E-05 | 1.871E-01 | 3.687E-01 | 3.571E-01 | 4.210E-01 | 5.210E-01 |
| 4.977E-05 | 1.871E-01 | 3.778E-01 | 3.746E-01 | 4.523E-01 | 5.843E-01 |
| 4.642E-05 | 1.871E-01 | 3.869E-01 | 3.917E-01 | 4.824E-01 | 6.451E-01 |
| 4.329E-05 | 1.871E-01 | 3.955E-01 | 4.077E-01 | 5.083E-01 | 7.040E-01 |
| 4.037E-05 | 1.871E-01 | 4.059E-01 | 4.246E-01 | 5.382E-01 | 7.473E-01 |
| 3.765E-05 | 1.871E-01 | 4.167E-01 | 4.425E-01 | 5.634E-01 | 8.052E-01 |
| 3.511E-05 | 1.871E-01 | 4.235E-01 | 4.545E-01 | 5.897E-01 | 8.476E-01 |
| 3.275E-05 | 1.871E-01 | 4.319E-01 | 4.688E-01 | 6.123E-01 | 8.791E-01 |
| 3.054E-05 | 1.871E-01 | 4.397E-01 | 4.821E-01 | 6.347E-01 | 8.991E-01 |
| 2.848E-05 | 1.871E-01 | 4.462E-01 | 4.993E-01 | 6.577E-01 | 9.229E-01 |
| 2.656E-05 | 1.871E-01 | 4.510E-01 | 5.147E-01 | 6.798E-01 | 9.435E-01 |
| 2.477E-05 | 1.871E-01 | 4.570E-01 | 5.293E-01 | 6.994E-01 | 9.558E-01 |
| 2.310E-05 | 1.871E-01 | 4.629E-01 | 5.472E-01 | 7.190E-01 | 9.670E-01 |
| 2.154E-05 | 1.871E-01 | 4.696E-01 | 5.632E-01 | 7.352E-01 | 9.773E-01 |
| 2.009E-05 | 1.871E-01 | 4.747E-01 | 5.781E-01 | 7.540E-01 | 9.841E-01 |
| 1.874E-05 | 1.871E-01 | 4.810E-01 | 5.898E-01 | 7.719E-01 | 9.887E-01 |
| 1.748E-05 | 1.871E-01 | 4.882E-01 | 6.033E-01 | 7.858E-01 | 9.919E-01 |
| 1.630E-05 | 1.871E-01 | 4.905E-01 | 6.157E-01 | 8.008E-01 | 9.980E-01 |
| 1.520E-05 | 1.871E-01 | 4.929E-01 | 6.285E-01 | 8.162E-01 | 9.989E-01 |
| 1.417E-05 | 1.871E-01 | 4.965E-01 | 6.422E-01 | 8.247E-01 | 9.991E-01 |
| 1.322E-05 | 1.871E-01 | 4.976E-01 | 6.528E-01 | 8.367E-01 | 9.999E-01 |
| 1.233E-05 | 1.871E-01 | 5.008E-01 | 6.638E-01 | 8.511E-01 | 1.000E+00 |
| 1.150E-05 | 1.871E-01 | 5.018E-01 | 6.738E-01 | 8.589E-01 | 1.000E+00 |
| 1.072E-05 | 1.871E-01 | 5.030E-01 | 6.831E-01 | 8.653E-01 | 1.000E+00 |
| 1.000E-05 | 1.871E-01 | 5.030E-01 | 6.910E-01 | 8.734E-01 | 1.000E+00 |

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43535 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/25/91 VERSION ***

CHI/Q AT CONTAINMENT BUILDING EDGE - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 6.294E-04 | 4.330E-04 | 2.039E-04 | 1.462E-04 | 8.843E-05 |

# APPENDIX A2

## Cumulative Frequency Distributions of Control Room x/Q Values Associated with Release from the Top of the Unit 1 Containment Building of the Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : CONTTOP.30

**********

CHI/Q AT CONTAINMENT BUILDING TOP - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=1.600E+03
RECEPTOR -- DIRECTION (DEG)= 203.00 -- DISTANCE (M)=9.300E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 75.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible] | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 1.844E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 8.529E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 2.005E-03 | 1.664E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 3.688E-03 | 2.615E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 6.708E-03 | 6.418E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 1.378E-02 | 1.117E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 2.181E-02 | 2.615E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 3.020E-02 | 4.540E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 3.903E-02 | 6.917E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 4.792E-02 | 1.112E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 5.680E-02 | 1.635E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 6.549E-02 | 2.161E-02 | 4.604E-05 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 7.383E-02 | 2.776E-02 | 2.072E-04 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 8.142E-02 | 3.594E-02 | 5.064E-04 | 0.000E+00 | 0.000E+00 |
| 2.848E-04 | 8.937E-02 | 4.476E-02 | 8.287E-04 | 0.000E+00 | 0.000E+00 |
| 2.656E-04 | 9.840E-02 | 5.322E-02 | 1.335E-03 | 0.000E+00 | 0.000E+00 |
| 2.477E-04 | 1.064E-01 | 6.399E-02 | 2.371E-03 | 0.000E+00 | 0.000E+00 |
| 2.310E-04 | 1.140E-01 | 7.449E-02 | 3.177E-03 | 0.000E+00 | 0.000E+00 |
| 2.154E-04 | 1.204E-01 | 8.438E-02 | 5.064E-03 | 0.000E+00 | 0.000E+00 |
| 2.009E-04 | 1.329E-01 | 9.491E-02 | 7.642E-03 | 0.000E+00 | 0.000E+00 |
| 1.874E-04 | 1.414E-01 | 1.057E-01 | 1.045E-02 | 1.608E-04 | 0.000E+00 |
| 1.748E-04 | 1.475E-01 | 1.168E-01 | 1.459E-02 | 1.356E-03 | 0.000E+00 |
| 1.630E-04 | 1.528E-01 | 1.267E-01 | 2.081E-02 | 3.332E-03 | 0.000E+00 |
| 1.520E-04 | 1.579E-01 | 1.370E-01 | 2.762E-02 | 4.802E-03 | 0.000E+00 |
| 1.417E-04 | 1.618E-01 | 1.476E-01 | 3.586E-02 | 5.836E-03 | 0.000E+00 |
| 1.322E-04 | 1.649E-01 | 1.586E-01 | 4.539E-02 | 7.812E-03 | 0.000E+00 |
| 1.233E-04 | 1.681E-01 | 1.694E-01 | 5.568E-02 | 1.222E-02 | 0.000E+00 |
| 1.150E-04 | 1.709E-01 | 1.815E-01 | 6.779E-02 | 1.794E-02 | 0.000E+00 |
| 1.072E-04 | 1.741E-01 | 1.923E-01 | 8.068E-02 | 2.495E-02 | 0.000E+00 |
| 1.000E-04 | 1.761E-01 | 2.024E-01 | 9.302E-02 | 3.423E-02 | 0.000E+00 |
| 9.326E-05 | 1.783E-01 | 2.133E-01 | 1.055E-01 | 4.650E-02 | 0.000E+00 |
| 8.697E-05 | 1.807E-01 | 2.242E-01 | 1.220E-01 | 6.103E-02 | 0.000E+00 |
| 8.111E-05 | 1.826E-01 | 2.345E-01 | 1.359E-01 | 7.922E-02 | 0.000E+00 |
| 7.565E-05 | 1.832E-01 | 2.443E-01 | 1.534E-01 | 9.558E-02 | 0.000E+00 |
| 7.055E-05 | 1.845E-01 | 2.564E-01 | 1.706E-01 | 1.198E-01 | 5.092E-04 |
| 6.579E-05 | 1.852E-01 | 2.673E-01 | 1.877E-01 | 1.463E-01 | 5.023E-03 |
| 6.136E-05 | 1.858E-01 | 2.796E-01 | 2.040E-01 | 1.732E-01 | 1.046E-02 |
| 5.722E-05 | 1.867E-01 | 2.901E-01 | 2.208E-01 | 1.964E-01 | 3.241E-02 |
| 5.337E-05 | 1.867E-01 | 3.003E-01 | 2.373E-01 | 2.233E-01 | 7.720E-02 |
| 4.977E-05 | 1.869E-01 | 3.117E-01 | 2.575E-01 | 2.517E-01 | 1.195E-01 |
| 4.642E-05 | 1.871E-01 | 3.242E-01 | 2.745E-01 | 2.796E-01 | 1.800E-01 |
| 4.329E-05 | 1.871E-01 | 3.352E-01 | 2.921E-01 | 3.086E-01 | 2.515E-01 |
| 4.037E-05 | 1.871E-01 | 3.448E-01 | 3.081E-01 | 3.404E-01 | 3.379E-01 |
| 3.765E-05 | 1.871E-01 | 3.533E-01 | 3.281E-01 | 3.765E-01 | 4.080E-01 |
| 3.511E-05 | 1.871E-01 | 3.614E-01 | 3.453E-01 | 4.023E-01 | 4.819E-01 |
| 3.275E-05 | 1.871E-01 | 3.721E-01 | 3.637E-01 | 4.334E-01 | 5.390E-01 |
| 3.054E-05 | 1.871E-01 | 3.823E-01 | 3.819E-01 | 4.634E-01 | 6.091E-01 |
| 2.848E-05 | 1.871E-01 | 3.904E-01 | 3.978E-01 | 4.910E-01 | 6.665E-01 |
| 2.656E-05 | 1.871E-01 | 3.980E-01 | 4.139E-01 | 5.187E-01 | 7.223E-01 |
| 2.477E-05 | 1.871E-01 | 4.102E-01 | 4.327E-01 | 5.465E-01 | 7.640E-01 |
| 2.310E-05 | 1.871E-01 | 4.195E-01 | 4.480E-01 | 5.720E-01 | 8.222E-01 |
| 2.154E-05 | 1.871E-01 | 4.263E-01 | 4.584E-01 | 5.963E-01 | 8.621E-01 |
| 2.009E-05 | 1.871E-01 | 4.346E-01 | 4.741E-01 | 6.211E-01 | 8.862E-01 |
| 1.874E-05 | 1.871E-01 | 4.412E-01 | 4.880E-01 | 6.423E-01 | 9.079E-01 |
| 1.748E-05 | 1.871E-01 | 4.472E-01 | 5.045E-01 | 6.653E-01 | 9.297E-01 |
| 1.630E-05 | 1.871E-01 | 4.553E-01 | 5.185E-01 | 6.860E-01 | 9.467E-01 |
| 1.520E-05 | 1.871E-01 | 4.609E-01 | 5.365E-01 | 7.068E-01 | 9.596E-01 |
| 1.417E-05 | 1.871E-01 | 4.686E-01 | 5.545E-01 | 7.235E-01 | 9.709E-01 |
| 1.322E-05 | 1.871E-01 | 4.742E-01 | 5.690E-01 | 7.421E-01 | 9.804E-01 |
| 1.233E-05 | 1.871E-01 | 4.776E-01 | 5.811E-01 | 7.608E-01 | 9.860E-01 |
| 1.150E-05 | 1.871E-01 | 4.820E-01 | 5.940E-01 | 7.774E-01 | 9.906E-01 |
| 1.072E-05 | 1.871E-01 | 4.882E-01 | 6.082E-01 | 7.911E-01 | 9.944E-01 |
| 1.000E-05 | 1.871E-01 | 4.928E-01 | 6.191E-01 | 8.050E-01 | 9.981E-01 |

<---------- AVERAGING PERIOD (HOURS)

| | | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

---

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT CONTAINMENT BUILDING TOP - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

<---------- AVERAGING PERIOD (HOURS) ---------->

| | 1 | 8 | 24 | 72 | 624 |
|---|---|---|---|---|---|
| CHI/Q(.05)= (SEC/M**3) | 3.972E-04 | 2.728E-04 | 1.281E-04 | 9.171E-05 | 5.568E-05 |

# APPENDIX A3

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 1
Auxiliary Building of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : BEAVR690.MET
THIS FILE NAME : AUXBLDG.30

**********

CHI/Q AT AUXILIARY BUILDING - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=1.600E+03
RECEPTOR -- DIRECTION (DEG)= 217.00 -- DISTANCE (M)=2.400E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES), AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 1.844E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 1.245E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 3.435E-03 | 2.852E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 6.247E-03 | 8.081E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 1.037E-02 | 2.258E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 2.480E-02 | 1.587E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 4.110E-02 | 9.175E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 5.583E-02 | 1.178E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 6.920E-02 | 2.265E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 8.026E-02 | 3.078E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 9.237E-02 | 3.941E-02 | 4.604E-05 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 1.035E-01 | 4.896E-02 | 2.072E-04 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 1.119E-01 | 5.923E-02 | 5.064E-04 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 1.193E-01 | 6.990E-02 | 1.312E-03 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 1.271E-01 | 8.089E-02 | 2.509E-03 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 1.370E-01 | 9.301E-02 | 4.788E-03 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 1.449E-01 | 1.046E-01 | 8.310E-03 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 1.502E-01 | 1.151E-01 | 1.232E-02 | 4.595E-04 | 0.000E+00 |
| 2.656E-03 | 1.536E-01 | 1.258E-01 | 1.779E-02 | 9.880E-04 | 0.000E+00 |
| 2.477E-03 | 1.697E-01 | 1.382E-01 | 2.504E-02 | 1.930E-03 | 0.000E+00 |
| 2.310E-03 | 1.751E-01 | 1.496E-01 | 3.354E-02 | 3.814E-03 | 0.000E+00 |
| 2.154E-03 | 1.801E-01 | 1.609E-01 | 4.203E-02 | 6.548E-03 | 0.000E+00 |
| 2.009E-03 | 1.832E-01 | 1.714E-01 | 5.007E-02 | 9.236E-03 | 0.000E+00 |
| 1.874E-03 | 1.862E-01 | 1.817E-01 | 6.102E-02 | 1.549E-02 | 0.000E+00 |
| 1.748E-03 | 1.895E-01 | 1.916E-01 | 7.396E-02 | 2.314E-02 | 0.000E+00 |
| 1.630E-03 | 1.918E-01 | 2.033E-01 | 8.860E-02 | 3.428E-02 | 0.000E+00 |
| 1.520E-03 | 1.936E-01 | 2.148E-01 | 1.045E-01 | 4.664E-02 | 0.000E+00 |
| 1.417E-03 | 1.958E-01 | 2.261E-01 | 1.204E-01 | 6.020E-02 | 0.000E+00 |
| 1.322E-03 | 1.977E-01 | 2.377E-01 | 1.371E-01 | 7.522E-02 | 3.333E-03 |
| 1.233E-03 | 1.995E-01 | 2.482E-01 | 1.525E-01 | 9.372E-02 | 5.486E-03 |
| 1.150E-03 | 2.009E-01 | 2.581E-01 | 1.685E-01 | 1.121E-01 | 9.074E-03 |
| 1.072E-03 | 2.011E-01 | 2.674E-01 | 1.844E-01 | 1.346E-01 | 1.736E-02 |
| 1.000E-03 | 2.024E-01 | 2.771E-01 | 2.037E-01 | 1.595E-01 | 2.706E-02 |

| | | | | | |
|---|---|---|---|---|---|
| | | 2.959E-01 | 2.407E-01 | 2.199E-01 | 8.467E-02 |
| 8.697E-04 | 2.036E-01 | 3.066E-01 | 2.603E-01 | 2.434E-01 | 1.278E-01 |
| 8.111E-04 | 2.044E-01 | 3.182E-01 | 2.784E-01 | 2.739E-01 | 1.767E-01 |
| 7.565E-04 | 2.044E-01 | 3.296E-01 | 2.946E-01 | 3.061E-01 | 2.577E-01 |
| 7.055E-04 | 2.051E-01 | 3.394E-01 | 3.114E-01 | 3.384E-01 | 3.180E-01 |
| 6.579E-04 | 2.051E-01 | 3.500E-01 | 3.260E-01 | 3.685E-01 | 3.843E-01 |
| 6.136E-04 | 2.055E-01 | 3.605E-01 | 3.442E-01 | 4.006E-01 | 4.497E-01 |
| 5.722E-04 | 2.055E-01 | 3.689E-01 | 3.606E-01 | 4.323E-01 | 5.079E-01 |
| 5.337E-04 | 2.055E-01 | 3.787E-01 | 3.766E-01 | 4.604E-01 | 5.609E-01 |
| 4.977E-04 | 2.055E-01 | 3.875E-01 | 3.927E-01 | 4.894E-01 | 6.164E-01 |
| 4.642E-04 | 2.055E-01 | 3.960E-01 | 4.091E-01 | 5.107E-01 | 6.678E-01 |
| 4.329E-04 | 2.055E-01 | 4.060E-01 | 4.210E-01 | 5.342E-01 | 7.117E-01 |
| 4.037E-04 | 2.055E-01 | 4.147E-01 | 4.360E-01 | 5.543E-01 | 7.482E-01 |
| 3.765E-04 | 2.055E-01 | 4.219E-01 | 4.513E-01 | 5.802E-01 | 7.774E-01 |
| 3.511E-04 | 2.055E-01 | 4.326E-01 | 4.670E-01 | 6.077E-01 | 8.208E-01 |
| 3.275E-04 | 2.055E-01 | 4.442E-01 | 4.812E-01 | 6.323E-01 | 8.516E-01 |
| 3.054E-04 | 2.055E-01 | 4.519E-01 | 4.933E-01 | 6.580E-01 | 8.903E-01 |
| 2.848E-04 | 2.055E-01 | 4.571E-01 | 5.077E-01 | 6.803E-01 | 9.110E-01 |
| 2.656E-04 | 2.055E-01 | 4.632E-01 | 5.187E-01 | 6.982E-01 | 9.359E-01 |
| 2.477E-04 | 2.055E-01 | 4.713E-01 | 5.298E-01 | 7.129E-01 | 9.592E-01 |
| 2.310E-04 | 2.055E-01 | 4.753E-01 | 5.447E-01 | 7.266E-01 | 9.714E-01 |
| 2.154E-04 | 2.055E-01 | 4.804E-01 | 5.567E-01 | 7.386E-01 | 9.859E-01 |
| 2.009E-04 | 2.055E-01 | 4.839E-01 | 5.723E-01 | 7.522E-01 | 9.903E-01 |
| 1.874E-04 | 2.055E-01 | 4.891E-01 | 5.842E-01 | 7.641E-01 | 9.951E-01 |
| 1.748E-04 | 2.055E-01 | 4.945E-01 | 5.963E-01 | 7.770E-01 | 9.974E-01 |
| 1.630E-04 | 2.055E-01 | 4.992E-01 | 6.077E-01 | 7.875E-01 | 9.985E-01 |
| 1.520E-04 | 2.055E-01 | 5.045E-01 | 6.210E-01 | 8.024E-01 | 9.988E-01 |
| 1.417E-04 | 2.055E-01 | 5.050E-01 | 6.332E-01 | 8.160E-01 | 9.997E-01 |
| 1.322E-04 | 2.055E-01 | 5.088E-01 | 6.429E-01 | 8.247E-01 | 1.000E+00 |
| 1.233E-04 | 2.055E-01 | 5.107E-01 | 6.559E-01 | 8.342E-01 | 1.000E+00 |
| 1.150E-04 | 2.055E-01 | 5.107E-01 | 6.655E-01 | 8.437E-01 | 1.000E+00 |
| 1.072E-04 | 2.055E-01 | 5.135E-01 | 6.750E-01 | 8.537E-01 | 1.000E+00 |
| 1.000E-04 | 2.055E-01 | 5.135E-01 | 6.853E-01 | 8.651E-01 | 1.000E+00 |
| 9.326E-05 | 2.055E-01 | 5.152E-01 | 6.957E-01 | 8.724E-01 | 1.000E+00 |
| 8.697E-05 | 2.055E-01 | 5.152E-01 | 7.082E-01 | 8.829E-01 | 1.000E+00 |
| 8.111E-05 | 2.055E-01 | 5.167E-01 | 7.175E-01 | 8.895E-01 | 1.000E+00 |
| 7.565E-05 | 2.055E-01 | 5.167E-01 | 7.276E-01 | 8.968E-01 | 1.000E+00 |
| 7.055E-05 | 2.055E-01 | 5.167E-01 | 7.397E-01 | 9.073E-01 | 1.000E+00 |
| 6.579E-05 | 2.055E-01 | 5.167E-01 | 7.477E-01 | 9.122E-01 | 1.000E+00 |
| 6.136E-05 | 2.055E-01 | 5.167E-01 | 7.536E-01 | 9.173E-01 | 1.000E+00 |
| 5.722E-05 | 2.055E-01 | 5.167E-01 | 7.601E-01 | 9.226E-01 | 1.000E+00 |
| 5.337E-05 | 2.055E-01 | 5.167E-01 | 7.644E-01 | 9.275E-01 | 1.000E+00 |
| 4.977E-05 | 2.055E-01 | 5.167E-01 | 7.701E-01 | 9.313E-01 | 1.000E+00 |
| 4.642E-05 | 2.055E-01 | 5.167E-01 | 7.776E-01 | 9.355E-01 | 1.000E+00 |
| 4.329E-05 | 2.055E-01 | 5.167E-01 | 7.814E-01 | 9.400E-01 | 1.000E+00 |
| 4.037E-05 | 2.055E-01 | 5.167E-01 | 7.849E-01 | 9.426E-01 | 1.000E+00 |
| 3.765E-05 | 2.055E-01 | 5.167E-01 | 7.897E-01 | 9.453E-01 | 1.000E+00 |
| 3.511E-05 | 2.055E-01 | 5.167E-01 | 7.917E-01 | 9.483E-01 | 1.000E+00 |
| 3.275E-05 | 2.055E-01 | 5.167E-01 | 7.941E-01 | 9.493E-01 | 1.000E+00 |
| 3.054E-05 | 2.055E-01 | 5.167E-01 | 7.969E-01 | 9.525E-01 | 1.000E+00 |
| 2.848E-05 | 2.055E-01 | 5.167E-01 | 7.999E-01 | 9.551E-01 | 1.000E+00 |
| 2.656E-05 | 2.055E-01 | 5.167E-01 | 8.003E-01 | 9.585E-01 | 1.000E+00 |
| 2.477E-05 | 2.055E-01 | 5.167E-01 | 8.006E-01 | 9.613E-01 | 1.000E+00 |
| 2.310E-05 | 2.055E-01 | 5.167E-01 | 8.018E-01 | 9.643E-01 | 1.000E+00 |
| 2.154E-05 | 2.055E-01 | 5.167E-01 | 8.020E-01 | 9.651E-01 | 1.000E+00 |
| 2.009E-05 | 2.055E-01 | 5.167E-01 | 8.033E-01 | 9.684E-01 | 1.000E+00 |
| 1.874E-05 | 2.055E-01 | 5.167E-01 | 8.033E-01 | 9.690E-01 | 1.000E+00 |
| 1.748E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.708E-01 | 1.000E+00 |
| 1.630E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.716E-01 | 1.000E+00 |
| 1.520E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.721E-01 | 1.000E+00 |
| 1.417E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.731E-01 | 1.000E+00 |
| 1.322E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.735E-01 | 1.000E+00 |
| 1.233E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.743E-01 | 1.000E+00 |
| 1.150E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.761E-01 | 1.000E+00 |
| 1.072E-05 | 2.055E-01 | 5.167E-01 | 8.050E-01 | 9.769E-01 | 1.000E+00 |

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT AUXILIARY BUILDING - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 5.883E-03 | 4.298E-03 | 2.010E-03 | 1.494E-03 | 9.252E-04 |

# APPENDIX A4

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 1
Main Steam Valve of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : MAINSTMV.30

**********

CHI/Q AT MAIN STEAM VALVE - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=1.[illegible]0E+03
RECEPTOR -- DIRECTION (DEG)= 212.00 -- DISTANCE (M)=5.800E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]26E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]97E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]71E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]5E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]5E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]9E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| [illegible]36E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 2.997E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 1.406E-03 | 4.754E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 3.135E-03 | 3.565E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 5.901E-03 | 8.794E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 1.282E-02 | 2.044E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 2.381E-02 | 4.278E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 3.617E-02 | 7.297E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 4.836E-02 | 1.184E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 5.917E-02 | 1.806E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 8.105E-02 | 3.340E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 9.101E-02 | 4.141E-02 | 2.532E-04 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 9.824E-02 | 5.065E-02 | 5.525E-04 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 1.065E-01 | 6.006E-02 | 9.208E-04 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 1.162E-01 | 7.085E-02 | 2.210E-03 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 1.242E-01 | 8.181E-02 | 3.867E-03 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 1.297E-01 | 9.229E-02 | 6.031E-03 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 1.364E-01 | 1.037E-01 | 8.540E-03 | 1.608E-04 | 0.000E+00 |
| 4.977E-04 | 1.457E-01 | 1.138E-01 | 1.349E-02 | 4.136E-04 | 0.000E+00 |
| 4.642E-04 | 1.574E-01 | 1.253E-01 | 1.876E-02 | 9.420E-04 | 0.000E+00 |
| 4.329E-04 | 1.635E-01 | 1.358E-01 | 2.590E-02 | 3.010E-03 | 0.000E+00 |
| 4.037E-04 | 1.695E-01 | 1.470E-01 | 3.230E-02 | 5.399E-03 | 0.000E+00 |
| 3.765E-04 | 1.727E-01 | 1.573E-01 | 3.996E-02 | 7.238E-03 | 0.000E+00 |
| 3.511E-04 | 1.761E-01 | 1.669E-01 | 4.979E-02 | 9.259E-03 | 0.000E+00 |
| 3.275E-04 | 1.794E-01 | 1.767E-01 | 6.119E-02 | 1.434E-02 | 0.000E+00 |
| 3.054E-04 | 1.819E-01 | 1.877E-01 | 7.525E-02 | 2.206E-02 | 0.000E+00 |
| 2.848E-04 | 1.845E-01 | 1.994E-01 | 8.915E-02 | 3.072E-02 | 0.000E+00 |
| 2.656E-04 | 1.869E-01 | 2.108E-01 | 1.046E-01 | 4.451E-02 | 0.000E+00 |
| 2.477E-04 | 1.890E-01 | 2.210E-01 | 1.211E-01 | 5.903E-02 | 0.000E+00 |
| 2.310E-04 | 1.907E-01 | 2.323E-01 | 1.363E-01 | 7.516E-02 | 0.000E+00 |
| 2.154E-04 | 1.917E-01 | 2.417E-01 | 1.529E-01 | 9.544E-02 | 0.000E+00 |
| 2.009E-04 | 1.927E-01 | 2.515E-01 | 1.694E-01 | 1.132E-01 | 2.616E-03 |
| 1.874E-04 | 1.942E-01 | 2.612E-01 | 1.864E-01 | 1.345E-01 | 9.143E-03 |
| 1.748E-04 | 1.953E-01 | 2.708E-01 | 2.033E-01 | 1.644E-01 | 1.706E-02 |
| 1.630E-04 | 1.955E-01 | 2.815E-01 | 2.199E-01 | 1.905E-01 | 3.417E-02 |
| 1.520E-04 | 1.965E-01 | 2.919E-01 | 2.383E-01 | 2.103E-01 | 6.625E-02 |
| 1.417E-04 | 1.965E-01 | 3.026E-01 | 2.543E-01 | 2.396E-01 | 1.156E-01 |
| 1.322E-04 | 1.974E-01 | 3.125E-01 | 2.722E-01 | 2.700E-01 | 1.813E-01 |
| 1.233E-04 | 1.974E-01 | 3.232E-01 | 2.900E-01 | 2.984E-01 | 2.464E-01 |
| 1.150E-04 | 1.977E-01 | 3.335E-01 | 3.069E-01 | 3.321E-01 | 3.056E-01 |
| 1.072E-04 | 1.977E-01 | 3.444E-01 | 3.205E-01 | 3.639E-01 | 3.745E-01 |
| 1.000E-04 | 1.977E-01 | 3.525E-01 | 3.376E-01 | 3.983E-01 | 4.420E-01 |
| 9.326E-05 | 1.977E-01 | 3.623E-01 | 3.533E-01 | 4.299E-01 | 5.047E-01 |
| 8.697E-05 | 1.977E-01 | 3.701E-01 | 3.681E-01 | 4.562E-01 | 5.727E-01 |
| 8.111E-05 | 1.977E-01 | 3.801E-01 | 3.843E-01 | 4.817E-01 | 6.230E-01 |
| 7.565E-05 | 1.977E-01 | 3.895E-01 | 3.991E-01 | 5.084E-01 | 6.699E-01 |
| 7.055E-05 | 1.977E-01 | 3.985E-01 | 4.133E-01 | 5.296E-01 | 7.209E-01 |
| 6.579E-05 | 1.977E-01 | 4.068E-01 | 4.296E-01 | 5.525E-01 | 7.652E-01 |
| 6.136E-05 | 1.977E-01 | 4.182E-01 | 4.451E-01 | 5.793E-01 | 7.946E-01 |
| 5.722E-05 | 1.977E-01 | 4.310E-01 | 4.598E-01 | 6.037E-01 | 8.378E-01 |
| 5.337E-05 | 1.977E-01 | 4.375E-01 | 4.731E-01 | 6.285E-01 | 8.714E-01 |
| 4.977E-05 | 1.977E-01 | 4.443E-01 | 4.852E-01 | 6.492E-01 | 8.989E-01 |
| 4.642E-05 | 1.977E-01 | 4.510E-01 | 4.975E-01 | 6.682E-01 | 9.194E-01 |
| 4.329E-05 | 1.977E-01 | 4.595E-01 | 5.126E-01 | 6.894E-01 | 9.381E-01 |
| 4.037E-05 | 1.977E-01 | 4.630E-01 | 5.272E-01 | 7.052E-01 | 9.585E-01 |
| 3.765E-05 | 1.977E-01 | 4.692E-01 | 5.398E-01 | 7.205E-01 | 9.708E-01 |
| 3.511E-05 | 1.977E-01 | 4.742E-01 | 5.556E-01 | 7.317E-01 | 9.794E-01 |
| 3.275E-05 | 1.977E-01 | 4.802E-01 | 5.687E-01 | 7.479E-01 | 9.926E-01 |
| 3.054E-05 | 1.977E-01 | 4.859E-01 | 5.815E-01 | 7.608E-01 | 9.954E-01 |
| 2.848E-05 | 1.977E-01 | 4.906E-01 | 5.960E-01 | 7.757E-01 | 9.973E-01 |
| 2.656E-05 | 1.977E-01 | 4.952E-01 | 6.074E-01 | 7.894E-01 | 9.980E-01 |
| 2.477E-05 | 1.977E-01 | 4.957E-01 | 6.198E-01 | 8.012E-01 | 9.982E-01 |
| 2.310E-05 | 1.977E-01 | 5.001E-01 | 6.294E-01 | 8.130E-01 | 9.989E-01 |
| 2.154E-05 | 1.977E-01 | 5.026E-01 | 6.420E-01 | 8.253E-01 | 9.993E-01 |
| 2.009E-05 | 1.977E-01 | 5.026E-01 | 6.527E-01 | 8.352E-01 | 9.994E-01 |
| 1.874E-05 | 1.977E-01 | 5.063E-01 | 6.618E-01 | 8.471E-01 | 1.000E+00 |
| 1.748E-05 | 1.977E-01 | 5.063E-01 | 6.730E-01 | 8.574E-01 | 1.000E+00 |
| 1.630E-05 | 1.977E-01 | 5.086E-01 | 6.828E-01 | 8.669E-01 | 1.000E+00 |
| 1.520E-05 | 1.977E-01 | 5.086E-01 | 6.958E-01 | 8.775E-01 | 1.000E+00 |
| 1.417E-05 | 1.977E-01 | 5.099E-01 | 7.059E-01 | 8.846E-01 | 1.000E+00 |
| 1.322E-05 | 1.977E-01 | 5.099E-01 | 7.156E-01 | 8.924E-01 | 1.000E+00 |
| 1.233E-05 | 1.977E-01 | 5.099E-01 | 7.284E-01 | 9.011E-01 | 1.000E+00 |
| 1.150E-05 | 1.977E-01 | 5.099E-01 | 7.369E-01 | 9.050E-01 | 1.000E+00 |
| 1.072E-05 | 1.977E-01 | 5.099E-01 | 7.422E-01 | 9.114E-01 | 1.000E+00 |
| 1.000E-05 | 1.977E-01 | 5.099E-01 | 7.491E-01 | 9.151E-01 | 1.000E+00 |

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

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*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT MAIN STEAM VALVE - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 1.061E-03 | 7.602E-04 | 3.507E-04 | 2.587E-04 | 1.575E-04 |

# APPENDIX A5

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 1
Service Building of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : SERVBLDG.30

**********

CHI/Q AT SERVICE BUILDING - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=6.270E+02
RECEPTOR -- DIRECTION (DEG)= 231.00 -- DISTANCE (M)=7.500E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 1.383E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 1.106E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 3.919E-03 | 4.754E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 6.731E-03 | 4.516E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 2.577E-02 | 6.560E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 4.530E-02 | 1.305E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 6.526E-02 | 2.182E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 8.421E-02 | 3.147E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 9.930E-02 | 4.157E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 1.123E-01 | 5.286E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 1.274E-01 | 6.508E-02 | 2.302E-05 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 1.377E-01 | 7.706E-02 | 5.294E-04 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 1.473E-01 | 8.956E-02 | 1.865E-03 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 1.547E-01 | 1.020E-01 | 4.120E-03 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 1.615E-01 | 1.134E-01 | 9.139E-03 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 1.724E-01 | 1.269E-01 | 1.462E-02 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 1.786E-01 | 1.406E-01 | 2.178E-02 | 2.068E-04 | 0.000E+00 |
| 3.511E-04 | 1.844E-01 | 1.531E-01 | 2.967E-02 | 1.310E-03 | 0.000E+00 |
| 3.275E-04 | 1.890E-01 | 1.648E-01 | 3.897E-02 | 4.343E-03 | 0.000E+00 |
| 3.054E-04 | 2.024E-01 | 1.784E-01 | 4.924E-02 | 9.007E-03 | 0.000E+00 |
| 2.848E-04 | 2.090E-01 | 1.904E-01 | 6.100E-02 | 1.537E-02 | 0.000E+00 |
| 2.656E-04 | 2.134E-01 | 2.039E-01 | 7.477E-02 | 2.585E-02 | 0.000E+00 |
| 2.477E-04 | 2.170E-01 | 2.158E-01 | 8.738E-02 | 3.945E-02 | 0.000E+00 |
| 2.310E-04 | 2.196E-01 | 2.278E-01 | 1.016E-01 | 5.441E-02 | 0.000E+00 |
| 2.154E-04 | 2.214E-01 | 2.389E-01 | 1.163E-01 | 7.038E-02 | 1.713E-03 |
| 2.009E-04 | 2.230E-01 | 2.508E-01 | 1.331E-01 | 8.515E-02 | 5.440E-03 |
| 1.874E-04 | 2.245E-01 | 2.638E-01 | 1.486E-01 | 1.023E-01 | 9.004E-03 |
| 1.748E-04 | 2.264E-01 | 2.755E-01 | 1.665E-01 | 1.202E-01 | 1.533E-02 |
| 1.630E-04 | 2.280E-01 | 2.883E-01 | 1.836E-01 | 1.389E-01 | 3.565E-02 |
| 1.520E-04 | 2.293E-01 | 2.993E-01 | 2.031E-01 | 1.641E-01 | 6.231E-02 |
| 1.417E-04 | 2.303E-01 | 3.097E-01 | 2.235E-01 | 1.897E-01 | 8.620E-02 |
| 1.322E-04 | 2.311E-01 | 3.190E-01 | 2.413E-01 | 2.212E-01 | 1.271E-01 |
| 1.233E-04 | 2.314E-01 | 3.298E-01 | 2.627E-01 | 2.501E-01 | 1.631E-01 |
| 1.150E-04 | 2.323E-01 | 3.403E-01 | 2.830E-01 | 2.758E-01 | 1.971E-01 |
| 1.072E-04 | 2.326E-01 | 3.511E-01 | 3.021E-01 | 3.034E-01 | 2.447E-01 |
| 1.000E-04 | 2.330E-01 | 3.611E-01 | 3.241E-01 | 3.303E-01 | 3.009E-01 |
| 9.326E-05 | 2.334E-01 | 3.712E-01 | 3.464E-01 | 3.619E-01 | 3.693E-01 |
| 8.697E-05 | 2.334E-01 | 3.823E-01 | 3.656E-01 | 3.924E-01 | 4.346E-01 |
| 8.111E-05 | 2.335E-01 | 3.910E-01 | 3.840E-01 | 4.235E-01 | 4.962E-01 |
| 7.565E-05 | 2.337E-01 | 4.025E-01 | 4.003E-01 | 4.554E-01 | 5.469E-01 |
| 7.055E-05 | 2.337E-01 | 4.132E-01 | 4.166E-01 | 4.848E-01 | 5.936E-01 |
| 6.579E-05 | 2.337E-01 | 4.219E-01 | 4.325E-01 | 5.150E-01 | 6.480E-01 |
| 6.136E-05 | 2.337E-01 | 4.304E-01 | 4.481E-01 | 5.416E-01 | 6.885E-01 |
| 5.722E-05 | 2.337E-01 | 4.367E-01 | 4.632E-01 | 5.691E-01 | 7.348E-01 |
| 5.337E-05 | 2.337E-01 | 4.453E-01 | 4.744E-01 | 6.006E-01 | 7.717E-01 |
| 4.977E-05 | 2.337E-01 | 4.526E-01 | 4.902E-01 | 6.219E-01 | 8.112E-01 |
| 4.642E-05 | 2.337E-01 | 4.604E-01 | 5.038E-01 | 6.479E-01 | 8.540E-01 |
| 4.329E-05 | 2.337E-01 | 4.681E-01 | 5.162E-01 | 6.727E-01 | 8.972E-01 |
| 4.037E-05 | 2.337E-01 | 4.745E-01 | 5.298E-01 | 6.945E-01 | 9.307E-01 |
| 3.765E-05 | 2.337E-01 | 4.861E-01 | 5.410E-01 | 7.116E-01 | 9.512E-01 |
| 3.511E-05 | 2.337E-01 | 4.927E-01 | 5.550E-01 | 7.289E-01 | 9.656E-01 |
| 3.275E-05 | 2.337E-01 | 4.983E-01 | 5.674E-01 | 7.462E-01 | 9.783E-01 |
| 3.054E-05 | 2.337E-01 | 5.047E-01 | 5.811E-01 | 7.588E-01 | 9.882E-01 |
| 2.848E-05 | 2.337E-01 | 5.088E-01 | 5.930E-01 | 7.716E-01 | 9.947E-01 |
| 2.656E-05 | 2.337E-01 | 5.145E-01 | 6.056E-01 | 7.820E-01 | 9.978E-01 |
| 2.477E-05 | 2.337E-01 | 5.183E-01 | 6.194E-01 | 7.926E-01 | 9.989E-01 |
| 2.310E-05 | 2.337E-01 | 5.231E-01 | 6.301E-01 | 8.032E-01 | 9.999E-01 |
| 2.154E-05 | 2.337E-01 | 5.276E-01 | 6.391E-01 | 8.140E-01 | 1.000E+00 |
| 2.009E-05 | 2.337E-01 | 5.303E-01 | 6.496E-01 | 8.251E-01 | 1.000E+00 |
| 1.874E-05 | 2.337E-01 | 5.340E-01 | 6.601E-01 | 8.360E-01 | 1.000E+00 |
| 1.748E-05 | 2.337E-01 | 5.374E-01 | 6.729E-01 | 8.445E-01 | 1.000E+00 |
| 1.630E-05 | 2.337E-01 | 5.403E-01 | 6.806E-01 | 8.548E-01 | 1.000E+00 |
| 1.520E-05 | 2.337E-01 | 5.411E-01 | 6.904E-01 | 8.623E-01 | 1.000E+00 |
| 1.417E-05 | 2.337E-01 | 5.424E-01 | 6.986E-01 | 8.709E-01 | 1.000E+00 |
| 1.322E-05 | 2.337E-01 | 5.454E-01 | 7.072E-01 | 8.778E-01 | 1.000E+00 |
| 1.233E-05 | 2.337E-01 | 5.454E-01 | 7.141E-01 | 8.841E-01 | 1.000E+00 |
| 1.150E-05 | 2.337E-01 | 5.469E-01 | 7.235E-01 | 8.922E-01 | 1.000E+00 |
| 1.072E-05 | 2.337E-01 | 5.470E-01 | 7.320E-01 | 8.986E-01 | 1.000E+00 |
| 1.000E-05 | 2.337E-01 | 5.478E-01 | 7.410E-01 | 9.074E-01 | 1.000E+00 |

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT SERVICE BUILDING - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 7.979E-04 | 6.245E-04 | 3.040E-04 | 2.358E-04 | 1.570E-04 |

# APPENDIX A6

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 1
Turbine Building of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : REAV8690.MET
THIS FILE NAME : TURBBLDG.30

**********

CHI/Q AT TURBINE BUILDING - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=1.844E+03
RECEPTOR -- DIRECTION (DEG)= 273.00 -- DISTANCE (M)=3.400E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. (DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 5.071E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 1.567E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 2.927E-03 | 4.516E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 4.656E-03 | 9.270E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 1.452E-02 | 2.995E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 2.990E-02 | 9.793E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 4.742E-02 | 1.804E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 6.565E-02 | 2.736E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 8.174E-02 | 3.720E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 9.658E-02 | 4.735E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 1.113E-01 | 5.790E-02 | 2.302E-05 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 1.227E-01 | 6.807E-02 | 5.525E-04 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 1.326E-01 | 7.815E-02 | 2.279E-03 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 1.410E-01 | 8.821E-02 | 4.788E-03 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 1.528E-01 | 9.902E-02 | 9.484E-03 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 1.629E-01 | 1.100E-01 | 1.595E-02 | 1.608E-04 | 0.000E+00 |
| 1.520E-03 | 1.693E-01 | 1.215E-01 | 2.198E-02 | 1.034E-03 | 0.000E+00 |
| 1.417E-03 | 1.767E-01 | 1.330E-01 | 2.988E-02 | 3.102E-03 | 0.000E+00 |
| 1.322E-03 | 1.947E-01 | 1.458E-01 | 3.978E-02 | 5.445E-03 | 0.000E+00 |
| 1.233E-03 | 2.031E-01 | 1.580E-01 | 4.873E-02 | 8.823E-03 | 0.000E+00 |
| 1.150E-03 | 2.088E-01 | 1.699E-01 | 5.796E-02 | 1.358E-02 | 0.000E+00 |
| 1.072E-03 | 2.125E-01 | 1.818E-01 | 6.772E-02 | 2.089E-02 | 0.000E+00 |
| 1.000E-03 | 2.150E-01 | 1.950E-01 | 7.785E-02 | 3.230E-02 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 2.183E-01 | 2.193E-01 | 1.001E-01 | 5.402E-02 | 0.000E+00 |
| 8.111E-04 | 2.195E-01 | 2.329E-01 | 1.116E-01 | 6.881C-02 | 8.565E-04 |
| 7.565E-04 | 2.205E-01 | 2.449E-01 | 1.224E-01 | 8.327E-02 | 3.750E-03 |
| 7.055E-04 | 2.218E-01 | 2.580E-01 | 1.353E-01 | 9.919E-02 | 1.208E-02 |
| 6.579E-04 | 2.228E-01 | 2.705E-01 | 1.515E-01 | 1.193E-01 | 3.386E-02 |
| 6.136E-04 | 2.238E-01 | 2.822E-01 | 1.687E-01 | 1.425E-01 | 5.623E-02 |
| 5.722E-04 | 2.245E-01 | 2.932E-01 | 1.814E-01 | 1.671E-01 | 8.035E-02 |
| 5.337E-04 | 2.247E-01 | 3.041E-01 | 2.000E-01 | 1.932E-01 | 1.097E-01 |
| 4.977E-04 | 2.251E-01 | 3.147E-01 | 2.180E-01 | 2.158E-01 | 1.493E-01 |
| 4.642E-04 | 2.257E-01 | 3.251E-01 | 2.374E-01 | 2.399E-01 | 1.926E-01 |
| 4.329E-04 | 2.257E-01 | 3.358E-01 | 2.549E-01 | 2.645E-01 | 2.257E-01 |
| 4.037E-04 | 2.264E-01 | 3.473E-01 | 2.748E-01 | 2.895E-01 | 2.554E-01 |
| 3.765E-04 | 2.264E-01 | 3.596E-01 | 2.972E-01 | 3.163E-01 | 2.856E-01 |
| 3.511E-04 | 2.266E-01 | 3.717E-01 | 3.152E-01 | 3.499E-01 | 3.231E-01 |
| 3.275E-04 | 2.266E-01 | 3.854E-01 | 3.365E-01 | 3.777E-01 | 3.662E-01 |
| 3.054E-04 | 2.268E-01 | 3.971E-01 | 3.603E-01 | 4.037E-01 | 4.297E-01 |
| 2.848E-04 | 2.268E-01 | 4.060E-01 | 3.830E-01 | 4.319E-01 | 4.937E-01 |
| 2.656E-04 | 2.268E-01 | 4.153E-01 | 4.047E-01 | 4.619E-01 | 5.679E-01 |
| 2.477E-04 | 2.268E-01 | 4.239E-01 | 4.248E-01 | 4.910E-01 | 6.160E-01 |
| 2.310E-04 | 2.268E-01 | 4.305E-01 | 4.411E-01 | 5.249E-01 | 6.593E-01 |
| 2.154E-04 | 2.268E-01 | 4.382E-01 | 4.575E-01 | 5.547E-01 | 7.082E-01 |
| 2.009E-04 | 2.268E-01 | 4.460E-01 | 4.757E-01 | 5.773E-01 | 7.644E-01 |
| 1.874E-04 | 2.268E-01 | 4.535E-01 | 4.933E-01 | 6.042E-01 | 8.133E-01 |
| 1.748E-04 | 2.268E-01 | 4.599E-01 | 5.094E-01 | 6.346E-01 | 8.528E-01 |
| 1.630E-04 | 2.268E-01 | 4.721E-01 | 5.264E-01 | 6.586E-01 | 8.843E-01 |
| 1.520E-04 | 2.268E-01 | 4.803E-01 | 5.393E-01 | 6.792E-01 | 9.111E-01 |
| 1.417E-04 | 2.268E-01 | 4.864E-01 | 5.550E-01 | 7.023E-01 | 9.437E-01 |
| 1.322E-04 | 2.268E-01 | 4.902E-01 | 5.690E-01 | 7.235E-01 | 9.647E-01 |
| 1.233E-04 | 2.268E-01 | 4.948E-01 | 5.816E-01 | 7.454E-01 | 9.812E-01 |
| 1.150E-04 | 2.268E-01 | 4.981E-01 | 5.926E-01 | 7.613E-01 | 9.920E-01 |
| 1.072E-04 | 2.268E-01 | 5.012E-01 | 6.056E-01 | 7.802E-01 | 9.974E-01 |
| 1.000E-04 | 2.268E-01 | 5.039E-01 | 6.168E-01 | 7.968E-01 | 9.979E-01 |
| 9.326E-05 | 2.268E-01 | 5.068E-01 | 6.263E-01 | 8.088E-01 | 9.993E-01 |
| 8.697E-05 | 2.268E-01 | 5.097E-01 | 6.391E-01 | 8.187E-01 | 9.995E-01 |
| 8.111E-05 | 2.268E-01 | 5.117E-01 | 6.514E-01 | 8.298E-01 | 9.997E-01 |
| 7.565E-05 | 2.268E-01 | 5.149E-01 | 6.600E-01 | 8.381E-01 | 1.000E+00 |
| 7.055E-05 | 2.268E-01 | 5.160E-01 | 6.729E-01 | 8.483E-01 | 1.000E+00 |
| 6.579E-05 | 2.268E-01 | 5.179E-01 | 6.862E-01 | 8.584E-01 | 1.000E+00 |
| 6.136E-05 | 2.268E-01 | 5.179E-01 | 6.960E-01 | 8.680E-01 | 1.000E+00 |
| 5.722E-05 | 2.268E-01 | 5.197E-01 | 7.028E-01 | 8.768E-01 | 1.000E+00 |
| 5.337E-05 | 2.268E-01 | 5.208E-01 | 7.120E-01 | 8.845E-01 | 1.000E+00 |
| 4.977E-05 | 2.268E-01 | 5.216E-01 | 7.180E-01 | 8.907E-01 | 1.000E+00 |
| 4.642E-05 | 2.268E-01 | 5.226E-01 | 7.246E-01 | 8.983E-01 | 1.000E+00 |
| 4.329E-05 | 2.268E-01 | 5.226E-01 | 7.313E-01 | 9.040E-01 | 1.000E+00 |
| 4.037E-05 | 2.268E-01 | 5.229E-01 | 7.381E-01 | 9.094E-01 | 1.000E+00 |
| 3.765E-05 | 2.268E-01 | 5.230E-01 | 7.429E-01 | 9.109E-01 | 1.000E+00 |
| 3.511E-05 | 2.268E-01 | 5.230E-01 | 7.499E-01 | 9.155E-01 | 1.000E+00 |
| 3.275E-05 | 2.268E-01 | 5.230E-01 | 7.590E-01 | 9.185E-01 | 1.000E+00 |
| 3.054E-05 | 2.268E-01 | 5.230E-01 | 7.657E-01 | 9.202E-01 | 1.000E+00 |
| 2.848E-05 | 2.268E-01 | 5.230E-01 | 7.692E-01 | 9.254E-01 | 1.000E+00 |
| 2.656E-05 | 2.268E-01 | 5.230E-01 | 7.718E-01 | 9.289E-01 | 1.000E+00 |
| 2.477E-05 | 2.268E-01 | 5.230E-01 | 7.764E-01 | 9.328E-01 | 1.000E+00 |
| 2.310E-05 | 2.268E-01 | 5.230E-01 | 7.811E-01 | 9.356E-01 | 1.000E+00 |
| 2.154E-05 | 2.268E-01 | 5.230E-01 | 7.823E-01 | 9.420E-01 | 1.000E+00 |
| 2.009E-05 | 2.268E-01 | 5.230E-01 | 7.849E-01 | 9.440E-01 | 1.000E+00 |
| 1.874E-05 | 2.268E-01 | 5.230E-01 | 7.881E-01 | 9.466E-01 | 1.000E+00 |
| 1.748E-05 | 2.268E-01 | 5.230E-01 | 7.904E-01 | 9.505E-01 | 1.000E+00 |
| 1.630E-05 | 2.268E-01 | 5.230E-01 | 7.934E-01 | 9.530E-01 | 1.000E+00 |
| 1.520E-05 | 2.268E-01 | 5.230E-01 | 7.941E-01 | 9.554E-01 | 1.000E+00 |
| 1.417E-05 | 2.268E-01 | 5.230E-01 | 7.941E-01 | 9.581E-01 | 1.000E+00 |
| 1.322E-05 | 2.268E-01 | 5.230E-01 | 7.962E-01 | 9.610E-01 | 1.000E+00 |
| 1.233E-05 | 2.268E-01 | 5.230E-01 | 7.983E-01 | 9.620E-01 | 1.000E+00 |
| 1.150E-05 | 2.268E-01 | 5.230E-01 | 7.988E-01 | 9.632E-01 | 1.000E+00 |
| 1.072E-05 | 2.268E-01 | 5.230E-01 | 7.995E-01 | 9.652E-01 | 1.000E+00 |
| 1.000E-05 | 2.268E-01 | 5.230E-01 | 7.999E-01 | 9.668E-01 | 1.000E+00 |

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

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*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT TURBINE BUILDING - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 3.024E-03 | 2.434E-03 | 1.221E-03 | 8.897E-04 | 6.256E-04 |

APPENDIX A7

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 1
Gaseous Waste Storage Vault of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : BEAVB690.MET
THIS FILE NAME : GASWSTOR.30

**********

CHI/Q AT GASEOUS WASTE STORAGE VAULT - UNIT 1

**********

BUILDING X-SECT AREA (M**2)=3.430E+02
RECEPTOR -- DIRECTION (DEG)= 163.00 -- DISTANCE (M)=4.600E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 6.915E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 1.153E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 2.997E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 4.841E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 9.451E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 1.775E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 2.974E-03 | 2.377E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 4.334E-03 | 1.188E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 6.431E-03 | 2.615E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 8.759E-03 | 3.803E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 1.194E-02 | 5.942E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 1.535E-02 | 9.745E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 1.925E-02 | 1.545E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 2.386E-02 | 2.210E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 2.872E-02 | 3.161E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 4.015E-02 | 5.847E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 4.617E-02 | 8.176E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 5.793E-02 | 1.150E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 6.625E-02 | 1.604E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 7.653E-02 | 2.085E-02 | 1.611E-04 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 8.720E-02 | 2.736E-02 | 2.992E-04 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 9.771E-02 | 3.532E-02 | 3.913E-04 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 1.076E-01 | 4.347E-02 | 4.834E-04 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 1.186E-01 | 5.386E-02 | 8.057E-04 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 1.301E-01 | 6.574E-02 | 1.381E-03 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 1.414E-01 | 7.832E-02 | 2.210E-03 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 1.533E-01 | 9.187E-02 | 3.637E-03 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 1.628E-01 | 1.063E-01 | 5.410E-03 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 1.654E-01 | 1.214E-01 | 8.448E-03 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 1.754E-01 | 1.371E-01 | 1.116E-02 | 4.136E-04 | 0.000E+00 |
| 3.054E-04 | 1.836E-01 | 1.552E-01 | 1.450E-02 | 1.241E-03 | 0.000E+00 |
| 2.848E-04 | 1.837E-01 | 1.735E-01 | 1.791E-02 | 2.665E-03 | 0.000E+00 |
| 2.656E-04 | 1.903E-01 | 1.893E-01 | 2.304E-02 | 3.998E-03 | 0.000E+00 |
| 2.477E-04 | 1.903E-01 | 2.076E-01 | 2.912E-02 | 6.204E-03 | 0.000E+00 |
| 2.310E-04 | 1.946E-01 | 2.220E-01 | 3.704E-02 | 8.340E-03 | 0.000E+00 |
| 2.154E-04 | 1.946E-01 | 2.379E-01 | 4.958E-02 | 1.172E-02 | 0.000E+00 |
| 2.009E-04 | 1.966E-01 | 2.548E-01 | 6.655E-02 | 1.574E-02 | 0.000E+00 |
| 1.874E-04 | 1.966E-01 | 2.732E-01 | 8.522E-02 | 2.429E-02 | 0.000E+00 |
| 1.748E-04 | 1.966E-01 | 2.903E-01 | 1.040E-01 | 3.708E-02 | 0.000E+00 |
| 1.630E-04 | 1.966E-01 | 3.065E-01 | 1.289E-01 | 5.229E-02 | 0.000E+00 |
| 1.520E-04 | 1.966E-01 | 3.228E-01 | 1.558E-01 | 7.483E-02 | 0.000E+00 |
| 1.417E-04 | 1.966E-01 | 3.370E-01 | 1.834E-01 | 1.036E-01 | 0.000E+00 |
| 1.322E-04 | 1.966E-01 | 3.496E-01 | 2.175E-01 | 1.381E-01 | 2.083E-03 |
| 1.233E-04 | 1.966E-01 | 3.632E-01 | 2.470E-01 | 1.766E-01 | 1.498E-02 |
| 1.150E-04 | 1.966E-01 | 3.753E-01 | 2.832E-01 | 2.198E-01 | 4.023E-02 |
| 1.072E-04 | 1.966E-01 | 3.879E-01 | 3.147E-01 | 2.696E-01 | 9.572E-02 |
| 1.000E-04 | 1.966E-01 | 4.018E-01 | 3.470E-01 | 3.218E-01 | 1.599E-01 |
| 9.326E-05 | 1.966E-01 | 4.136E-01 | 3.773E-01 | 3.774E-01 | 2.699E-01 |
| 8.697E-05 | 1.966E-01 | 4.272E-01 | 4.077E-01 | 4.268E-01 | 3.873E-01 |
| 8.111E-05 | 1.966E-01 | 4.391E-01 | 4.350E-01 | 4.761E-01 | 5.142E-01 |
| 7.565E-05 | 1.966E-01 | 4.494E-01 | 4.624E-01 | 5.197E-01 | 6.257E-01 |
| 7.055E-05 | 1.966E-01 | 4.571E-01 | 4.897E-01 | 5.598E-01 | 7.228E-01 |
| 6.579E-05 | 1.966E-01 | 4.655E-01 | 5.139E-01 | 5.977E-01 | 7.998E-01 |
| 6.136E-05 | 1.966E-01 | 4.736E-01 | 5.361E-01 | 6.330E-01 | 8.612E-01 |
| 5.722E-05 | 1.966E-01 | 4.831E-01 | 5.589E-01 | 6.691E-01 | 9.040E-01 |
| 5.337E-05 | 1.966E-01 | 4.920E-01 | 5.837E-01 | 7.004E-01 | 9.396E-01 |
| 4.977E-05 | 1.966E-01 | 5.018E-01 | 6.018E-01 | 7.306E-01 | 9.603E-01 |
| 4.642E-05 | 1.966E-01 | 5.096E-01 | 6.168E-01 | 7.568E-01 | 9.779E-01 |
| 4.329E-05 | 1.966E-01 | 5.120E-01 | 6.335E-01 | 7.775E-01 | 9.914E-01 |
| 4.037E-05 | 1.966E-01 | 5.166E-01 | 6.485E-01 | 7.982E-01 | 9.971E-01 |
| 3.765E-05 | 1.966E-01 | 5.224E-01 | 6.664E-01 | 8.158E-01 | 9.991E-01 |
| 3.511E-05 | 1.966E-01 | 5.227E-01 | 6.804E-01 | 8.309E-01 | 1.000E+00 |
| 3.275E-05 | 1.966E-01 | 5.274E-01 | 6.930E-01 | 8.445E-01 | 1.000E+00 |
| 3.054E-05 | 1.966E-01 | 5.286E-01 | 7.037E-01 | 8.540E-01 | 1.000E+00 |
| 2.848E-05 | 1.966E-01 | 5.309E-01 | 7.115E-01 | 8.617E-01 | 1.000E+00 |
| 2.656E-05 | 1.966E-01 | 5.309E-01 | 7.216E-01 | 8.743E-01 | 1.000E+00 |
| 2.477E-05 | 1.966E-01 | 5.323E-01 | 7.281E-01 | 8.816E-01 | 1.000E+00 |
| 2.310E-05 | 1.966E-01 | 5.323E-01 | 7.361E-01 | 8.896E-01 | 1.000E+00 |
| 2.154E-05 | 1.966E-01 | 5.323E-01 | 7.443E-01 | 8.997E-01 | 1.000E+00 |
| 2.009E-05 | 1.966E-01 | 5.323E-01 | 7.509E-01 | 9.067E-01 | 1.000E+00 |
| 1.874E-05 | 1.966E-01 | 5.323E-01 | 7.584E-01 | 9.134E-01 | 1.000E+00 |
| 1.748E-05 | 1.966E-01 | 5.323E-01 | 7.673E-01 | 9.196E-01 | 1.000E+00 |
| 1.630E-05 | 1.966E-01 | 5.323E-01 | 7.737E-01 | 9.234E-01 | 1.000E+00 |
| 1.520E-05 | 1.966E-01 | 5.323E-01 | 7.801E-01 | 9.273E-01 | 1.000E+00 |
| 1.417E-05 | 1.966E-01 | 5.323E-01 | 7.832E-01 | 9.320E-01 | 1.000E+00 |
| 1.322E-05 | 1.966E-01 | 5.323E-01 | 7.904E-01 | 9.363E-01 | 1.000E+00 |
| 1.233E-05 | 1.966E-01 | 5.323E-01 | 7.945E-01 | 9.421E-01 | 1.000E+00 |
| 1.150E-05 | 1.966E-01 | 5.323E-01 | 7.964E-01 | 9.472E-01 | 1.000E+00 |
| 1.072E-05 | 1.966E-01 | 5.323E-01 | 8.022E-01 | 9.522E-01 | 1.000E+00 |
| 1.000E-05 | 1.966E-01 | 5.323E-01 | 8.062E-01 | 9.550E-01 | 1.000E+00 |

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT GASEOUS WASTE STORAGE VAULT - UNIT 1

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 7.929E-04 | 5.108E-04 | 2.151E-04 | 1.647E-04 | 1.136E-04 |

# APPENDIX A8

## Cumulative Frequency Distributions of Control Room x/Q Values Associated with Release from the Edge of the Unit 2 Containment Building of the Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : CONTEDGE.230

**********
CHI/Q AT CONTAINMENT BUILDING EDGE - UNIT 2
**********

BUILDING X-SECT AREA (M**2)=1.600E+03
RECEPTOR -- DIRECTION (DEG)= 46.00 -- DISTANCE (M)=7.400E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 1.383E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 3.458E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 9.220E-04 | 2.377E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 1.637E-03 | 4.754E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 2.951E-03 | 2.615E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 4.725E-03 | 4.991E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 7.031E-03 | 1.046E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 1.040E-02 | 1.830E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 1.427E-02 | 3.185E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 1.925E-02 | 4.849E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 2.483E-02 | 7.202E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 3.345E-02 | 9.603E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 3.969E-02 | 1.276E-02 | 6.906E-05 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 4.903E-02 | 1.547E-02 | 1.611E-04 | 0.000E+00 | 0.000E+00 |
| 2.848E-04 | 5.920E-02 | 1.966E-02 | 3.223E-04 | 0.000E+00 | 0.000E+00 |
| 2.656E-04 | 6.597E-02 | 2.315E-02 | 8.057E-04 | 0.000E+00 | 0.000E+00 |
| 2.477E-04 | 7.164E-02 | 2.869E-02 | 1.197E-03 | 0.000E+00 | 0.000E+00 |
| 2.310E-04 | 7.835E-02 | 3.294E-02 | 1.634E-03 | 0.000E+00 | 0.000E+00 |
| 2.154E-04 | 8.298E-02 | 3.853E-02 | 3.131E-03 | 0.000E+00 | 0.000E+00 |
| 2.009E-04 | 8.699E-02 | 4.469E-02 | 4.742E-03 | 2.068E-04 | 0.000E+00 |
| 1.874E-04 | 9.167E-02 | 5.029E-02 | 6.238E-03 | 7.352E-04 | 0.000E+00 |
| 1.748E-04 | 9.539E-02 | 5.624E-02 | 8.793E-03 | 1.[illegible]78E-03 | 0.000E+00 |
| 1.630E-04 | 9.829E-02 | 6.182E-02 | 1.123E-02 | 2.872E-03 | 0.000E+00 |
| 1.520E-04 | 1.015E-01 | 6.917E-02 | 1.377E-02 | 3.929E-03 | 0.000E+00 |
| 1.417E-04 | 1.040E-01 | 7.696E-02 | 1.713E-02 | 5.491E-03 | 0.000E+00 |
| 1.322E-04 | 1.070E-01 | 8.412E-02 | 2.079E-02 | 7.375E-03 | 0.000E+00 |
| 1.233E-04 | 1.092E-01 | 9.151E-02 | 2.521E-02 | 9.673E-03 | 0.000E+00 |
| 1.150E-04 | 1.094E-01 | 9.969E-02 | 3.020E-02 | 1.275E-02 | 0.000E+00 |
| 1.072E-04 | 1.112E-01 | 1.095E-01 | 3.757E-02 | 1.707E-02 | 0.000E+00 |
| 1.000E-04 | 1.118E-01 | 1.179E-01 | 4.323E-02 | 2.054E-02 | 0.000E+00 |
| 9.326E-05 | 1.127E-01 | 1.253E-01 | 4.995E-02 | 2.461E-02 | 0.000E+00 |
| 8.697E-05 | 1.133E-01 | 1.328E-01 | 5.674E-02 | 2.996E-02 | 0.000E+00 |
| 8.111E-05 | 1.138E-01 | 1.409E-01 | 6.390E-02 | 3.486E-02 | 0.000E+00 |
| 7.565E-05 | 1.139E-01 | 1.506E-01 | 7.258E-02 | 4.007E-02 | 0.000E+00 |
| 7.055E-05 | 1.145E-01 | 1.611E-01 | 7.999E-02 | 5.011E-02 | 0.000E+00 |
| 6.579E-05 | 1.145E-01 | 1.684E-01 | 9.146E-02 | 5.790E-02 | 0.000E+00 |
| 6.136E-05 | 1.145E-01 | 1.777E-01 | 1.028E-01 | 6.670E-02 | 0.000E+00 |
| 5.722E-05 | 1.145E-01 | 1.876E-01 | 1.129E-01 | 7.451E-02 | 2.546E-03 |
| 5.337E-05 | 1.145E-01 | 1.962E-01 | 1.240E-01 | 8.490E-02 | 1.065E-02 |
| 4.977E-05 | 1.145E-01 | 2.034E-01 | 1.358E-01 | 9.634E-02 | 2.090E-02 |
| 4.642E-05 | 1.145E-01 | 2.143E-01 | 1.461E-01 | 1.179E-01 | 3.294E-02 |
| 4.329E-05 | 1.145E-01 | 2.220E-01 | 1.607E-01 | 1.387E-01 | 4.238E-02 |
| 4.037E-05 | 1.145E-01 | 2.299E-01 | 1.735E-01 | 1.556E-01 | 5.745E-02 |
| 3.765E-05 | 1.145E-01 | 2.429E-01 | 1.853E-01 | 1.767E-01 | 8.354E-02 |
| 3.511E-05 | 1.145E-01 | 2.547E-01 | 1.977E-01 | 1.960E-01 | 1.047E-01 |
| 3.275E-05 | 1.145E-01 | 2.637E-01 | 2.105E-01 | 2.125E-01 | 1.451E-01 |
| 3.054E-05 | 1.145E-01 | 2.721E-01 | 2.243E-01 | 2.323E-01 | 1.761E-01 |
| 2.848E-05 | 1.145E-01 | 2.808E-01 | 2.381E-01 | 2.515E-01 | 2.196E-01 |
| 2.656E-05 | 1.145E-01 | 2.889E-01 | 2.527E-01 | 2.741E-01 | 2.543E-01 |
| 2.477E-05 | 1.145E-01 | 2.955E-01 | 2.650E-01 | 2.996E-01 | 2.996E-01 |
| 2.310E-05 | 1.145E-01 | 3.046E-01 | 2.789E-01 | 3.208E-01 | 3.451E-01 |
| 2.154E-05 | 1.145E-01 | 3.121E-01 | 2.947E-01 | 3.400E-01 | 3.899E-01 |
| 2.009E-05 | 1.145E-01 | 3.144E-01 | 3.084E-01 | 3.637E-01 | 4.428E-01 |
| 1.874E-05 | 1.145E-01 | 3.227E-01 | 3.203E-01 | 3.863E-01 | 5.031E-01 |
| 1.748E-05 | 1.145E-01 | 3.281E-01 | 3.340E-01 | 4.107E-01 | 5.515E-01 |
| 1.630E-05 | 1.145E-01 | 3.360E-01 | 3.478E-01 | 4.356E-01 | 5.951E-01 |
| 1.520E-05 | 1.145E-01 | 3.428E-01 | 3.639E-01 | 4.590E-01 | 6.378E-01 |
| 1.417E-05 | 1.145E-01 | 3.438E-01 | 3.797E-01 | 4.786E-01 | 6.891E-01 |
| 1.322E-05 | 1.145E-01 | 3.470E-01 | 3.922E-01 | 5.029E-01 | 7.388E-01 |
| 1.233E-05 | 1.145E-01 | 3.512E-01 | 4.052E-01 | 5.194E-01 | 7.907E-01 |
| 1.150E-05 | 1.145E-01 | 3.517E-01 | 4.143E-01 | 5.372E-01 | 8.303E-01 |
| 1.072E-05 | 1.145E-01 | 3.550E-01 | 4.292E-01 | 5.549E-01 | 8.759E-01 |
| 1.000E-05 | 1.145E-01 | 3.552E-01 | 4.419E-01 | 5.756E-01 | 9.130E-01 |

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT CONTAINMENT BUILDING EDGE - UNIT 2

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 3.034E-04 | 1.881E-04 | 9.321E-05 | 7.060E-05 | 4.179E-05 |

# APPENDIX A9

## Cumulative Frequency Distributions of Control Room x/Q Values Associated with Release from the Top of the Unit 2 Containment Building of the Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : CONTTOP.230

**********

CHI/Q AT CONTAINMENT BUILDING TOP - UNIT 2

**********

BUILDING X-SECT AREA (M**2)=1.600E+03
RECEPTOR -- DIRECTION (DEG)= 46.00 -- DISTANCE (M)=9.500E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED = MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

## FREQUENCY OF EXCEEDING GIVEN CHI/Q FOR VARIOUS AVERAGING PERIODS

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 1.153E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 2.536E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 5.763E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 1.176E-03 | 2.377E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 2.305E-03 | 1.188E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 3.734E-03 | 3.565E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 5.763E-03 | 7.606E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 8.091E-03 | 1.497E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-04 | 1.238E-02 | 2.472E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-04 | 1.697E-02 | 4.041E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-04 | 2.206E-02 | 5.847E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-04 | 2.914E-02 | 8.295E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-04 | 3.647E-02 | 1.115E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-04 | 4.232E-02 | 1.398E-02 | 1.151E-04 | 0.000E+00 | 0.000E+00 |
| 1.874E-04 | 5.343E-02 | 1.761E-02 | 1.611E-04 | 0.000E+00 | 0.000E+00 |
| 1.748E-04 | 6.274E-02 | 2.125E-02 | 6.445E-04 | 0.000E+00 | 0.000E+00 |
| 1.630E-04 | 6.987E-02 | 2.619E-02 | 9.438E-04 | 0.000E+00 | 0.000E+00 |
| 1.520E-04 | 7.549E-02 | 3.076E-02 | 1.404E-03 | 0.000E+00 | 0.000E+00 |
| 1.417E-04 | 7.999E-02 | 3.580E-02 | 2.440E-03 | 0.000E+00 | 0.000E+00 |
| 1.322E-04 | 8.584E-02 | 4.190E-02 | 3.660E-03 | 0.000E+00 | 0.000E+00 |
| 1.233E-04 | 8.967E-02 | 4.751E-02 | 5.317E-03 | 3.446E-04 | 0.000E+00 |
| 1.150E-04 | 9.437E-02 | 5.341E-02 | 7.412E-03 | 1.333E-03 | 0.000E+00 |
| 1.072E-04 | 9.790E-02 | 5.873E-02 | 1.004E-02 | 2.435E-03 | 0.000E+00 |
| 1.000E-04 | 1.011E-01 | 6.534E-02 | 1.232E-02 | 3.309E-03 | 0.000E+00 |
| 9.326E-05 | 1.037E-01 | 7.266E-02 | 1.572E-02 | 4.549E-03 | 0.000E+00 |
| 8.697E-05 | 1.051E-01 | 8.043E-02 | 1.888E-02 | 6.709E-03 | 0.000E+00 |
| 8.111E-05 | 1.074E-01 | 8.797E-02 | 2.297E-02 | 8.593E-03 | 0.000E+00 |
| 7.565E-05 | 1.094E-01 | 9.555E-02 | 2.772E-02 | 1.124E-02 | 0.000E+00 |
| 7.055E-05 | 1.110E-01 | 1.038E-01 | 3.379E-02 | 1.516E-02 | 0.000E+00 |
| 6.579E-05 | 1.112E-01 | 1.141E-01 | 4.010E-02 | 1.900E-02 | 0.000E+00 |
| 6.136E-05 | 1.127E-01 | 1.215E-01 | 4.652E-02 | 2.247E-02 | 0.000E+00 |
| 5.722E-05 | 1.127E-01 | 1.283E-01 | 5.311E-02 | 2.792E-02 | 0.000E+00 |
| 5.337E-05 | 1.138E-01 | 1.367E-01 | 6.010E-02 | 3.249E-02 | 0.000E+00 |
| 4.977E-05 | 1.138E-01 | 1.454E-01 | 6.781E-02 | 3.770E-02 | 0.000E+00 |
| 4.642E-05 | 1.145E-01 | 1.557E-01 | 7.596E-02 | 4.480E-02 | 0.000E+00 |
| 4.329E-05 | 1.145E-01 | 1.652E-01 | 8.582E-02 | 5.351E-02 | 0.000E+00 |
| 4.037E-05 | 1.145E-01 | 1.725E-01 | 9.753E-02 | 6.153E-02 | 0.000E+00 |
| 3.765E-05 | 1.145E-01 | 1.838E-01 | 1.072E-01 | 6.950E-02 | 7.639E-04 |
| 3.511E-05 | 1.145E-01 | 1.920E-01 | 1.176E-01 | 7.872E-02 | 5.787E-03 |
| 3.275E-05 | 1.145E-01 | 2.005E-01 | 1.298E-01 | 9.002E-02 | 1.611E-02 |
| 3.054E-05 | 1.145E-01 | 2.095E-01 | 1.407E-01 | 1.057E-01 | 2.745E-02 |
| 2.848E-05 | 1.145E-01 | 2.182E-01 | 1.531E-01 | 1.263E-01 | 3.660E-02 |
| 2.656E-05 | 1.145E-01 | 2.262E-01 | 1.674E-01 | 1.463E-01 | 4.833E-02 |
| 2.477E-05 | 1.145E-01 | 2.370E-01 | 1.795E-01 | 1.644E-01 | 7.359E-02 |
| 2.310E-05 | 1.145E-01 | 2.477E-01 | 1.916E-01 | 1.872E-01 | 9.366E-02 |
| 2.154E-05 | 1.145E-01 | 2.583E-01 | 2.040E-01 | 2.033E-01 | 1.157E-01 |
| 2.009E-05 | 1.145E-01 | 2.670E-01 | 2.168E-01 | 2.209E-01 | 1.628E-01 |
| 1.874E-05 | 1.145E-01 | 2.760E-01 | 2.300E-01 | 2.410E-01 | 1.932E-01 |
| 1.748E-05 | 1.145E-01 | 2.857E-01 | 2.455E-01 | 2.633E-01 | 2.352E-01 |
| 1.630E-05 | 1.145E-01 | 2.916E-01 | 2.593E-01 | 2.851E-01 | 2.793E-01 |
| 1.520E-05 | 1.145E-01 | 3.005E-01 | 2.718E-01 | 3.089E-01 | 3.192E-01 |
| 1.417E-05 | 1.145E-01 | 3.076E-01 | 2.876E-01 | 3.288E-01 | 3.692E-01 |
| 1.322E-05 | 1.145E-01 | 3.133E-01 | 3.020E-01 | 3.507E-01 | 4.149E-01 |
| 1.233E-05 | 1.145E-01 | 3.198E-01 | 3.149E-01 | 3.762E-01 | 4.765E-01 |
| 1.150E-05 | 1.145E-01 | 3.281E-01 | 3.290E-01 | 3.978E-01 | 5.217E-01 |
| 1.072E-05 | 1.145E-01 | 3.345E-01 | 3.421E-01 | 4.242E-01 | 5.743E-01 |
| 1.000E-05 | 1.145E-01 | 3.394E-01 | 3.559E-01 | 4.460E-01 | 6.111E-01 |

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

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*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT CONTAINMENT BUILDING TOP - UNIT 2

C H I / Q  E x C E E D E D  5.0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 1.915E-04 | 1.197E-04 | 5.914E-05 | 4.452E-05 | 2.644E-05 |

# APPENDIX A.0

## Cumulative Frequency Distributions of Control Room χ/Q Values Associated with Release from Unit 2 Auxiliary Building of the Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME : BEAV8690.MET
THIS FILE NAME : AUXBLDG.230

**********

CHI/Q AT AUXILIARY BUILDING - UNIT 2

**********

BUILDING X-SECT AREA (M**2)=2.094E+03
RECEPTOR -- DIRECTION (DEG)= 52.00 -- DISTANCE (M)=3.000E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 30.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 1.153E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 3.688E-04 | 2.377E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 8.529E-04 | 7.131E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 1.637E-03 | 1.426E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 2.720E-03 | 3.328E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 4.472E-03 | 8.557E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| .656E-03 | 6.754E-03 | 1.735E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 9.889E-03 | 3.019E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 1.402E-02 | 5.087E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 1.989E-02 | 7.725E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 2.679E-02 | 1.048E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 3.294E-02 | 1.371E-02 | 4.604E-05 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 3.916E-02 | 1.680E-02 | 3.453E-04 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 5.157E-02 | 2.030E-02 | 4.604E-04 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 6.125E-02 | 2.451E-02 | 9.208E-04 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 6.717E-02 | 2.824E-02 | 1.634E-03 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 7.369E-02 | 3.249E-02 | 2.877E-03 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 7.923E-02 | 3.698E-02 | 4.097E-03 | 3.446E-04 | 0.000E+00 |
| 1.150E-03 | 8.448E-02 | 4.250E-02 | 5.778E-03 | 6.893E-04 | 0.000E+00 |
| 1.072E-03 | 9.031E-02 | 4.730E-02 | 7.550E-03 | 1.608E-03 | 0.000E+00 |
| 1.000E-03 | 9.446E-02 | 5.348E-02 | 1.027E-02 | 3.332E-03 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 1.023E-01 | 6.467E-02 | 1.517E-02 | 5.882E-03 | 0.000E+00 |
| 8.111E-04 | 1.040E-01 | 7.176E-02 | 1.908E-02 | 7.398E-03 | 0.000E+00 |
| 7.565E-04 | 1.061E-01 | 7.934E-02 | 2.417E-02 | 9.122E-03 | 0.000E+00 |
| 7.055E-04 | 1.092E-01 | 8.597E-02 | 2.845E-02 | 1.105E-02 | 0.000E+00 |
| 6.579E-04 | 1.118E-01 | 9.220E-02 | 3.216E-02 | 1.321E-02 | 0.000E+00 |
| 6.136E-04 | 1.118E-01 | 9.995E-02 | 3.598E-02 | 1.537E-02 | 0.000E+00 |
| 5.722E-04 | 1.139E-01 | 1.081E-01 | 4.183E-02 | 2.220E-02 | 0.000E+00 |
| 5.337E-04 | 1.156E-01 | 1.155E-01 | 4.691E-02 | 2.716E-02 | 0.000E+00 |
| 4.977E-04 | 1.156E-01 | 1.232E-01 | 5.308E-02 | 3.205E-02 | 0.000E+00 |
| 4.642E-04 | 1.167E-01 | 1.307E-01 | 5.964E-02 | 3.754E-02 | 0.000E+00 |
| 4.329E-04 | 1.167E-01 | 1.384E-01 | 6.779E-02 | 4.230E-02 | 0.000E+00 |
| 4.037E-04 | 1.174E-01 | 1.482E-01 | 7.624E-02 | 5.009E-02 | 0.000E+00 |
| 3.765E-04 | 1.174E-01 | 1.574E-01 | 8.563E-02 | 5.808E-02 | 0.000E+00 |
| 3.511E-04 | 1.174E-01 | 1.647E-01 | 9.558E-02 | 6.502E-02 | 0.000E+00 |
| 3.275E-04 | 1.174E-01 | 1.742E-01 | 1.038E-01 | 7.460E-02 | 4.329E-03 |
| 3.054E-04 | 1.174E-01 | 1.829E-01 | 1.139E-01 | 8.315E-02 | 1.359E-02 |
| 2.848E-04 | 1.174E-01 | 1.924E-01 | 1.261E-01 | 9.436E-02 | 2.243E-02 |
| 2.656E-04 | 1.174E-01 | 2.002E-01 | 1.366E-01 | 1.063E-01 | 3.417E-02 |
| 2.477E-04 | 1.174E-01 | 2.090E-01 | 1.473E-01 | 1.273E-01 | 4.817E-02 |
| 2.310E-04 | 1.174E-01 | 2.174E-01 | 1.576E-01 | 1.436E-01 | 6.639E-02 |
| 2.154E-04 | 1.174E-01 | 2.270E-01 | 1.682E-01 | 1.594E-01 | 8.664E-02 |
| 2.009E-04 | 1.174E-01 | 2.381E-01 | 1.806E-01 | 1.753E-01 | 1.051E-01 |
| 1.874E-04 | 1.174E-01 | 2.496E-01 | 1.924E-01 | 1.954E-01 | 1.311E-01 |
| 1.748E-04 | 1.174E-01 | 2.590E-01 | 2.051E-01 | 2.104E-01 | 1.501E-01 |
| 1.630E-04 | 1.174E-01 | 2.678E-01 | 2.206E-01 | 2.288E-01 | 1.795E-01 |
| 1.520E-04 | 1.174E-01 | 2.755E-01 | 2.339E-01 | 2.531E-01 | 2.241E-01 |
| 1.417E-04 | 1.174E-01 | 2.856E-01 | 2.439E-01 | 2.721E-01 | 2.611E-01 |
| 1.322E-04 | 1.174E-01 | 2.932E-01 | 2.571E-01 | 2.925E-01 | 3.117E-01 |
| 1.233E-04 | 1.174E-01 | 3.003E-01 | 2.703E-01 | 3.126E-01 | 3.608E-01 |
| 1.150E-04 | 1.174E-01 | 3.070E-01 | 2.836E-01 | 3.323E-01 | 4.020E-01 |
| 1.072E-04 | 1.174E-01 | 3.131E-01 | 2.976E-01 | 3.549E-01 | 4.466E-01 |
| 1.000E-04 | 1.174E-01 | 3.221E-01 | 3.114E-01 | 3.710E-01 | 5.080E-01 |
| 9.326E-05 | 1.174E-01 | 3.237E-01 | 3.248E-01 | 3.954E-01 | 5.502E-01 |
| 8.697E-05 | 1.174E-01 | 3.300E-01 | 3.379E-01 | 4.158E-01 | 5.949E-01 |
| 8.111E-05 | 1.174E-01 | 3.372E-01 | 3.501E-01 | 4.400E-01 | 6.389E-01 |
| 7.565E-05 | 1.174E-01 | 3.418E-01 | 3.643E-01 | 4.588E-01 | 6.847E-01 |
| 7.055E-05 | 1.174E-01 | 3.425E-01 | 3.749E-01 | 4.819E-01 | 7.218E-01 |
| 6.579E-05 | 1.174E-01 | 3.476E-01 | 3.875E-01 | 4.994E-01 | 7.748E-01 |
| 6.136E-05 | 1.174E-01 | 3.476E-01 | 3.998E-01 | 5.240E-01 | 8.217E-01 |
| 5.722E-05 | 1.174E-01 | 3.513E-01 | 4.149E-01 | 5.425E-01 | 8.522E-01 |
| 5.337E-05 | 1.174E-01 | 3.513E-01 | 4.290E-01 | 5.643E-01 | 8.840E-01 |
| 4.977E-05 | 1.174E-01 | 3.534E-01 | 4.396E-01 | 5.856E-01 | 9.163E-01 |
| 4.642E-05 | 1.174E-01 | 3.534E-01 | 4.481E-01 | 6.056E-01 | 9.386E-01 |
| 4.329E-05 | 1.174E-01 | 3.534E-01 | 4.634E-01 | 6.222E-01 | 9.541E-01 |
| 4.037E-05 | 1.174E-01 | 3.534E-01 | 4.768E-01 | 6.411E-01 | 9.683E-01 |
| 3.765E-05 | 1.174E-01 | 3.534E-01 | 4.865E-01 | 6.512E-01 | 9.838E-01 |
| 3.511E-05 | 1.174E-01 | 3.534E-01 | 4.980E-01 | 6.694E-01 | 9.871E-01 |
| 3.275E-05 | 1.174E-01 | 3.534E-01 | 5.090E-01 | 6.836E-01 | 9.934E-01 |
| 3.054E-05 | 1.174E-01 | 3.534E-01 | 5.177E-01 | 6.970E-01 | 9.982E-01 |
| 2.848E-05 | 1.174E-01 | 3.534E-01 | 5.254E-01 | 7.128E-01 | 9.992E-01 |
| 2.656E-05 | 1.174E-01 | 3.534E-01 | 5.336E-01 | 7.257E-01 | 9.999E-01 |
| 2.477E-05 | 1.174E-01 | 3.534E-01 | 5.421E-01 | 7.377E-01 | 1.000E+00 |
| 2.310E-05 | 1.174E-01 | 3.534E-01 | 5.493E-01 | 7.507E-01 | 1.000E+00 |
| 2.154E-05 | 1.174E-01 | 3.534E-01 | 5.570E-01 | 7.610E-01 | 1.000E+00 |
| 2.009E-05 | 1.174E-01 | 3.534E-01 | 5.661E-01 | 7.725E-01 | 1.000E+00 |
| 1.874E-05 | 1.174E-01 | 3.534E-01 | 5.759E-01 | 7.819E-01 | 1.000E+00 |
| 1.748E-05 | 1.174E-01 | 3.534E-01 | 5.861E-01 | 7.988E-01 | 1.000E+00 |
| 1.630E-05 | 1.174E-01 | 3.534E-01 | 5.871E-01 | 8.047E-01 | 1.000E+00 |
| 1.520E-05 | 1.174E-01 | 3.534E-01 | 5.932E-01 | 8.109E-01 | 1.000E+00 |
| 1.417E-05 | 1.174E-01 | 3.534E-01 | 5.991E-01 | 8.180E-01 | 1.000E+00 |
| 1.322E-05 | 1.174E-01 | 3.534E-01 | 6.022E-01 | 8.264E-01 | 1.000E+00 |
| 1.233E-05 | 1.174E-01 | 3.534E-01 | 6.083E-01 | 8.335E-01 | 1.000E+00 |
| 1.150E-05 | 1.174E-01 | 3.534E-01 | 6.083E-01 | 8.424E-01 | 1.000E+00 |
| 1.072E-05 | 1.174E-01 | 3.534E-01 | 6.089E-01 | 8.465E-01 | 1.000E+00 |
| 1.000E-05 | 1.174E-01 | 3.534E-01 | 6.114E-01 | 8.501E-01 | 1.000E+00 |

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT AUXILIARY BUILDING - UNIT 2

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 1.644E-03 | 1.040E-03 | 5.154E-04 | 4.040E-04 | 2.460E-04 |

# APPENDIX A11

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 2
Main Steam Valve of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME : MAIN.CNT
MET DATA FILE NAME : REAV8690.MET
THIS FILE NAME : MAINSTMV.230

**********

CHI/Q AT MAIN STEAM VALVE - UNIT 2

**********

BUILDING X-S CT AREA (M**2)=9.310E+02
RECEPTOR -- DIRECTION (DEG)= 62.00 -- DISTANCE (MI)=8.500E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 90.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 75.00

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES)
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 6.915E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 2.675E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 5.763E-04 | 4.754E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 1.106E-03 | 1.902E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 2.075E-03 | 6.655E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 3.665E-03 | 1.593E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 5.348E-03 | 2.567E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 8.344E-03 | 3.969E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 1.219E-02 | 5.871E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 1.717E-02 | 8.319E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 2.215E-02 | 1.115E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-04 | 2.750E-02 | 1.381E-02 | 1.151E-04 | 0.000E+00 | 0.000E+00 |
| 2.656E-04 | 3.407E-02 | 1.764E-02 | 8.747E-04 | 0.000E+00 | 0.000E+00 |
| 2.477E-04 | 4.055E-02 | 2.013E-02 | 1.243E-03 | 0.000E+00 | 0.000E+00 |
| 2.310E-04 | 5.230E-02 | 2.477E-02 | 1.865E-03 | 0.000E+00 | 0.000E+00 |
| 2.154E-04 | 6.238E-02 | 2.807E-02 | 2.808E-03 | 0.000E+00 | 0.000E+00 |
| 2.009E-04 | 6.906E-02 | 3.259E-02 | 3.821E-03 | 5.285E-04 | 0.000E+00 |
| 1.874E-04 | 7.662E-02 | 3.789E-02 | 5.410E-03 | 1.241E-03 | 0.000E+00 |
| 1.748E-04 | 8.149E-02 | 4.307E-02 | 5.560E-03 | 1.884E-03 | 0.000E+00 |
| 1.630E-04 | 8.704E-02 | 4.832E-02 | 8.471E-03 | 3.010E-03 | 0.000E+00 |
| 1.520E-04 | 9.271E-02 | 5.360E-02 | 1.110E-02 | 4.572E-03 | 0.000E+00 |
| 1.417E-04 | 9.774E-02 | 5.990E-02 | 1.443E-02 | 5.744E-03 | 0.000E+00 |
| 1.322E-04 | 1.019E-01 | 6.555E-02 | 1.777E-02 | 6.778E-03 | 0.000E+00 |
| 1.233E-04 | 1.055E-01 | 7.131E-02 | 2.051E-02 | 7.927E-03 | 0.000E+00 |
| 1.150E-04 | 1.087E-01 | 7.753E-02 | 2.431E-02 | 9.420E-03 | 0.000E+00 |
| 1.072E-04 | 1.123E-01 | 8.459E-02 | 2.891E-02 | 1.098E-02 | 0.000E+00 |
| 1.000E-04 | 1.151E-01 | 9.046E-02 | 3.315E-02 | 1.473E-02 | 0.000E+00 |
| 9.326E-05 | 1.154E-01 | 9.662E-02 | 3.725E-02 | 1.799E-02 | 0.000E+00 |
| 8.697E-05 | 1.181E-01 | 1.037E-01 | 4.178E-02 | 2.252E-02 | 0.000E+00 |
| 8.111E-05 | 1.192E-01 | 1.105E-01 | 4.691E-02 | 2.670E-02 | 0.000E+00 |
| 7.565E-05 | 1.202E-01 | 1.178E-01 | 5.377E-02 | 3.159E-02 | 0.000E+00 |
| 7.055E-05 | 1.209E-01 | 1.248E-01 | 6.105E-02 | 3.787E-02 | 0.000E+00 |
| 6.579E-05 | 1.214E-01 | 1.315E-01 | 6.857E-02 | 4.292E-02 | 0.000E+00 |
| 6.136E-05 | 1.216E-01 | 1.385E-01 | 7.709E-02 | 4.669E-02 | 0.000E+00 |
| 5.722E-05 | 1.224E-01 | 1.477E-01 | 8.568E-02 | 5.482E-02 | 0.000E+00 |
| 5.337E-05 | 1.224E-01 | 1.559E-01 | 9.380E-02 | 6.507E-02 | 0.000E+00 |
| 4.977E-05 | 1.224E-01 | 1.638E-01 | 1.030E-01 | 7.447E-02 | 2.106E-03 |
| 4.642E-05 | 1.224E-01 | 1.718E-01 | 1.131E-01 | 8.828E-02 | 1.410E-02 |
| 4.329E-05 | 1.224E-01 | 1.801E-01 | 1.226E-01 | 1.010E-01 | 2.157E-02 |
| 4.037E-05 | 1.224E-01 | 1.882E-01 | 1.339E-01 | 1.113E-01 | 3.134E-02 |
| 3.765E-05 | 1.224E-01 | 1.975E-01 | 1.437E-01 | 1.278E-01 | 4.970E-02 |
| 3.511E-05 | 1.224E-01 | 2.054E-01 | 1.525E-01 | 1.387E-01 | 6.245E-02 |
| 3.275E-05 | 1.224E-01 | 2.139E-01 | 1.624E-01 | 1.554E-01 | 8.889E-02 |
| 3.054E-05 | 1.224E-01 | 2.216E-01 | 1.735E-01 | 1.698E-01 | 1.085E-01 |
| 2.848E-05 | 1.224E-01 | 2.311E-01 | 1.842E-01 | 1.875E-01 | 1.300E-01 |
| 2.656E-05 | 1.224E-01 | 2.411E-01 | 1.941E-01 | 2.081E-01 | 1.500E-01 |
| 2.477E-05 | 1.224E-01 | 2.524E-01 | 2.049E-01 | 2.247E-01 | 1.681E-01 |
| 2.310E-05 | 1.224E-01 | 2.619E-01 | 2.164E-01 | 2.413E-01 | 2.042E-01 |
| 2.154E-05 | 1.224E-01 | 2.707E-01 | 2.284E-01 | 2.603E-01 | 2.417E-01 |
| 2.009E-05 | 1.224E-01 | 2.780E-01 | 2.410E-01 | 2.779E-01 | 2.913E-01 |
| 1.874E-05 | 1.224E-01 | 2.859E-01 | 2.514E-01 | 2.982E-01 | 3.376E-01 |
| 1.748E-05 | 1.224E-01 | 2.945E-01 | 2.628E-01 | 3.149E-01 | 3.933E-01 |
| 1.630E-05 | 1.224E-01 | 3.027E-01 | 2.772E-01 | 3.342E-01 | 4.511E-01 |
| 1.520E-05 | 1.224E-01 | 3.128E-01 | 2.909E-01 | 3.573E-01 | 4.958E-01 |
| 1.417E-05 | 1.224E-01 | 3.195E-01 | 3.030E-01 | 3.809E-01 | 5.436E-01 |
| 1.322E-05 | 1.224E-01 | 3.265E-01 | 3.132E-01 | 4.027E-01 | 5.820E-01 |
| 1.233E-05 | 1.224E-01 | 3.343E-01 | 3.271E-01 | 4.215E-01 | 6.170E-01 |
| 1.150E-05 | 1.224E-01 | 3.368E-01 | 3.407E-01 | 4.394E-01 | 6.599E-01 |
| 1.072E-05 | 1.224E-01 | 3.418E-01 | 3.515E-01 | 4.602E-01 | 7.065E-01 |
| 1.000E-05 | 1.224E-01 | 3.478E-01 | 3.622E-01 | 4.747E-01 | 7.515E-01 |

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT MAIN STEAM VALVE - UNIT 2

CHI/Q EXCEEDED 5.0% OF THE TIME

| | AVERAGING PERIOD (HOURS) | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 2.342E-04 | 1.594E-04 | 7.861E-05 | 5.964E-05 | 3.759E-05 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME: REAVR690.MET
THIS FILE NAME: SERVBLDG.230

**********

CHI/Q AT SERVICE BUILDING - UNIT 2

**********

BUILDING X-SECT AREA (M**2)=2.191E+03
RECEPTOR -- DIRECTION (DEG)= 70.00 -- DISTANCE (M)=6.900E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0. DEGREES)= 90.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y  O F  E X C E E D I N G  G I V E N  C H I / Q
F O R  V A R I O U S  A V E R A G I N G  P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

APPENDIX A

Cumulative Frequency Distribution of Control Room
x/Q Values Associated with Releases from Unit 2
Service Building of the
Beaver Valley Power Station

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 6.915E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 1.153E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 4.841E-04 | 4.754E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 9.220E-04 | 2.139E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 1.821E-03 | 4.754E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 3.204E-03 | 1.331E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 5.094E-03 | 2.377E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 7.538E-03 | 3.589E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 1.146E-02 | 5.443E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 1.496E-02 | 7.986E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 1.920E-02 | 1.055E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 2.517E-02 | 1.357E-02 | 4.604E-05 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 3.204E-02 | 1.647E-02 | 7.596E-04 | 0.000E+00 | 0.000E+00 |
| 3.511E-04 | 4.043E-02 | 1.949E-02 | 1.105E-03 | 0.000E+00 | 0.000E+00 |
| 3.275E-04 | 4.889E-02 | 2.263E-02 | 1.657E-03 | 0.000E+00 | 0.000E+00 |
| 3.054E-04 | 5.823E-02 | 2.641E-02 | 3.085E-03 | 1.149E-04 | 0.000E+00 |
| 2.848E-04 | 6.537E-02 | 3.073E-02 | 4.074E-03 | 5.514E-04 | 0.000E+00 |
| 2.656E-04 | 7.238E-02 | 3.610E-02 | 5.479E-03 | 1.356E-03 | 0.000E+00 |
| 2.477E-04 | 7.777E-02 | 4.053E-02 | 6.860E-03 | 2.252E-03 | 0.000E+00 |
| 2.310E-04 | 8.524E-02 | 4.642E-02 | 8.517E-03 | 3.125E-03 | 0.000E+00 |
| 2.154E-04 | 9.128E-02 | 5.198E-02 | 1.084E-02 | 4.205E-03 | 0.000E+00 |
| 2.009E-04 | 9.656E-02 | 5.750E-02 | 1.333E-02 | 5.583E-03 | 0.000E+00 |
| 1.874E-04 | 1.019E-01 | 6.332E-02 | 1.604E-02 | 6.387E-03 | 0.000E+00 |
| 1.748E-04 | 1.065E-01 | 6.988E-02 | 1.890E-02 | 7.444E-03 | 0.000E+00 |
| 1.630E-04 | 1.106E-01 | 7.616E-02 | 2.284E-02 | 9.122E-03 | 0.000E+00 |
| 1.520E-04 | 1.131E-01 | 8.307E-02 | 2.730E-02 | 1.039E-02 | 0.000E+00 |
| 1.417E-04 | 1.155E-01 | 8.970E-02 | 3.126E-02 | 1.227E-02 | 0.000E+00 |
| 1.322E-04 | 1.195E-01 | 9.667E-02 | 3.596E-02 | 1.608E-02 | 0.000E+00 |
| 1.233E-04 | 1.222E-01 | 1.033E-01 | 4.084E-02 | 2.010E-02 | 0.000E+00 |
| 1.150E-04 | 1.224E-01 | 1.095E-01 | 4.701E-02 | 2.465E-02 | 0.000E+00 |
| 1.072E-04 | 1.251E-01 | 1.172E-01 | 5.311E-02 | 3.049E-02 | 0.000E+00 |
| 1.000E-04 | 1.251E-01 | 1.231E-01 | 5.950E-02 | 3.492E-02 | 0.000E+00 |
| 9.326E-05 | 1.264E-01 | 1.311E-01 | 6.689E-02 | 4.244E-02 | 0.000E+00 |
| 8.697E-05 | 1.264E-01 | 1.381E-01 | 7.500E-02 | 4.809E-02 | 0.000E+00 |
| 8.111E-05 | 1.275E-01 | 1.470E-01 | 8.308E-02 | 5.427E-02 | 0.000E+00 |
| 7.565E-05 | 1.275E-01 | 1.563E-01 | 9.067E-02 | 6.507E-02 | 0.000E+00 |
| 7.055E-05 | 1.275E-01 | 1.646E-01 | 9.995E-02 | 7.431E-02 | 0.000E+00 |
| 6.579E-05 | 1.275E-01 | 1.718E-01 | 1.091E-01 | 8.363E-02 | 8.750E-03 |
| 6.136E-05 | 1.275E-01 | 1.803E-01 | 1.194E-01 | 9.496E-02 | 1.836E-02 |
| 5.722E-05 | 1.275E-01 | 1.890E-01 | 1.299E-01 | 1.084E-01 | 2.974E-02 |
| 5.337E-05 | 1.275E-01 | 1.990E-01 | 1.416E-01 | 1.226E-01 | 4.322E-02 |
| 4.977E-05 | 1.275E-01 | 2.050E-01 | 1.528E-01 | 1.335E-01 | 5.854E-02 |
| 4.642E-05 | 1.275E-01 | 2.125E-01 | 1.625E-01 | 1.499E-01 | 7.991E-02 |
| 4.329E-05 | 1.275E-01 | 2.239E-01 | 1.722E-01 | 1.635E-01 | 1.007E-01 |
| 4.037E-05 | 1.275E-01 | 2.327E-01 | 1.832E-01 | 1.817E-01 | 1.172E-01 |
| 3.765E-05 | 1.275E-01 | 2.430E-01 | 1.940E-01 | 2.047E-01 | 1.310E-01 |
| 3.511E-05 | 1.275E-01 | 2.511E-01 | 2.072E-01 | 2.216E-01 | 1.537E-01 |
| 3.275E-05 | 1.275E-01 | 2.620E-01 | 2.186E-01 | 2.424E-01 | 1.783E-01 |
| 3.054E-05 | 1.275E-01 | 2.705E-01 | 2.300E-01 | 2.584E-01 | 2.210E-01 |
| 2.848E-05 | 1.275E-01 | 2.793E-01 | 2.418E-01 | 2.806E-01 | 2.871E-01 |
| 2.656E-05 | 1.275E-01 | 2.871E-01 | 2.520E-01 | 2.976E-01 | 3.374E-01 |
| 2.477E-05 | 1.275E-01 | 2.942E-01 | 2.640E-01 | 3.118E-01 | 4.055E-01 |
| 2.310E-05 | 1.275E-01 | 3.043E-01 | 2.769E-01 | 3.351E-01 | 4.616E-01 |
| 2.154E-05 | 1.275E-01 | 3.142E-01 | 2.907E-01 | 3.559E-01 | 4.992E-01 |
| 2.009E-05 | 1.275E-01 | 3.246E-01 | 3.033E-01 | 3.738E-01 | 5.427E-01 |
| 1.874E-05 | 1.275E-01 | 3.328E-01 | 3.131E-01 | 3.943E-01 | 5.910E-01 |
| 1.748E-05 | 1.275E-01 | 3.367E-01 | 3.278E-01 | 4.165E-01 | 6.306E-01 |
| 1.630E-05 | 1.275E-01 | 3.441E-01 | 3.420E-01 | 4.411E-01 | 6.726E-01 |
| 1.520E-05 | 1.275E-01 | 3.514E-01 | 3.552E-01 | 4.639E-01 | 7.210E-01 |
| 1.417E-05 | 1.275E-01 | 3.515E-01 | 3.672E-01 | 4.840E-01 | 7.717E-01 |
| 1.322E-05 | 1.275E-01 | 3.576E-01 | 3.757E-01 | 4.994E-01 | 8.129E-01 |
| 1.233E-05 | 1.275E-01 | 3.576E-01 | 3.902E-01 | 5.179E-01 | 8.415E-01 |
| 1.150E-05 | 1.275E-01 | 3.612E-01 | 4.034E-01 | 5.393E-01 | 8.639E-01 |
| 1.072E-05 | 1.275E-01 | 3.612E-01 | 4.171E-01 | 5.602E-01 | 8.914E-01 |
| 1.000E-05 | 1.275E-01 | 3.637E-01 | 4.259E-01 | 5.771E-01 | 9.128E-01 |

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43701 |
| MAX # OF MISSING HRS PER DATA PT | | | | | |
| ALLOWED | 0 | 0 | 6 | 18 | 45 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORE-CHI -- 10/23/91 VERSION ***

CHI/Q AT SERVICE BUILDING - UNIT 2

CHI/Q EXCEEDED 5.0% OF THE TIME

| | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 3.248E-04 | 2.209E-04 | 1.111E-04 | 8.512E-05 | 5.174E-05 |

APPENDIX A13

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 2
Turbine Building of the
Beaver Valley Power Station

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME : REAVBA90.MET
THIS FILE NAME : TURBBLDG.2TO

**********

CHI/Q AT TURBINE BUILDING - UNIT 2

**********

BUILDING X-SECT AREA (M**2)= 2.88E+02
RECEPTOR -- DIRECTION (DEG)= 93.50 -- DISTANCE (M)= 5.60E+01
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION
FOR WHICH CHI/Q .NE. 0, DEGREES)= 90.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

---

F R E Q U E N C Y O F E X C E E D I N G G I V E N C H I / Q
F O R V A R I O U S A V E R A G I N G P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.322E-03 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.233E-03 | 4.610E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.150E-03 | 2.536E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.072E-03 | 5.532E-04 | 9.508E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.000E-03 | 1.106E-03 | 2.615E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 3.550E-03 | 1.307E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-04 | 4.356E-03 | 1.949E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-04 | 7.008E-03 | 2.828E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-04 | 1.010E-02 | 4.207E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-04 | 1.279E-02 | 5.324E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-04 | 1.616E-02 | 6.893E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-04 | 1.946E-02 | 8.234E-03 | 4.504E-05 | 0.000E+00 | 0.000E+00 |
| 5.337E-04 | 2.377E-02 | 1.013E-02 | 1.151E-04 | 0.000E+00 | 0.000E+00 |
| 4.977E-04 | 3.149E-02 | 1.267E-02 | 7.827E-04 | 0.000E+00 | 0.000E+00 |
| 4.642E-04 | 3.919E-02 | 1.545E-02 | 1.289E-03 | 0.000E+00 | 0.000E+00 |
| 4.329E-04 | 4.615E-02 | 1.835E-02 | 1.819E-03 | 0.000E+00 | 0.000E+00 |
| 4.037E-04 | 5.228E-02 | 2.246E-02 | 2.371E-03 | 0.000E+00 | 0.000E+00 |
| 3.765E-04 | 6.122E-02 | 2.688E-02 | 3.831E-03 | 4.595E-04 | 0.000E+00 |
| 3.511E-04 | 6.759E-02 | 3.097E-02 | 3.936E-03 | 1.218E-03 | 0.000E+00 |
| 3.275E-04 | 7.367E-02 | 3.520E-02 | 5.225E-03 | 1.677E-03 | 0.000E+00 |
| 3.054E-04 | 7.989E-02 | 3.993E-02 | 6.699E-03 | 2.367E-03 | 0.000E+00 |
| 2.848E-04 | 8.967E-02 | 4.552E-02 | 8.517E-03 | 2.941E-03 | 0.000E+00 |
| 2.656E-04 | 9.458E-02 | 5.205E-02 | 1.040E-02 | 3.401E-03 | 0.000E+00 |
| 2.477E-04 | 1.021E-01 | 5.909E-02 | 1.335E-02 | 4.067E-03 | 0.000E+00 |
| 2.310E-04 | 1.099E-01 | 6.636E-02 | 1.644E-02 | 4.917E-03 | 0.000E+00 |
| 2.154E-04 | 1.183E-01 | 7.404E-02 | 1.947E-02 | 5.813E-03 | 0.000E+00 |
| 2.009E-04 | 1.233E-01 | 8.110E-02 | 2.327E-02 | 7.031E-03 | 0.000E+00 |
| 1.874E-04 | 1.259E-01 | 8.861E-02 | 2.772E-02 | 9.259E-03 | 0.000E+00 |
| 1.748E-04 | 1.322E-01 | 9.729E-02 | 3.262E-02 | 1.241E-02 | 0.000E+00 |
| 1.630E-04 | 1.322E-01 | 1.063E-01 | 3.736E-02 | 1.650E-02 | 0.000E+00 |
| 1.520E-04 | 1.370E-01 | 1.150E-01 | 4.450E-02 | 2.006E-02 | 0.000E+00 |
| 1.417E-04 | 1.379E-01 | 1.249E-01 | 5.076E-02 | 2.291E-02 | 0.000E+00 |
| 1.322E-04 | 1.398E-01 | 1.335E-01 | 5.750E-02 | 2.789E-02 | 0.000E+00 |
| 1.233E-04 | 1.398E-01 | 1.452E-01 | 6.508E-02 | 3.366E-02 | 0.000E+00 |
| 1.150E-04 | 1.419E-01 | 1.543E-01 | 7.207E-02 | 4.278E-02 | 0.000E+00 |
| 1.072E-04 | 1.419E-01 | 1.645E-01 | 7.965E-02 | 5.356E-02 | 0.000E+00 |
| 1.000E-04 | 1.419E-01 | 1.737E-01 | 8.922E-02 | 6.381E-02 | 0.000E+00 |
| 9.326E-05 | 1.419E-01 | 1.829E-01 | 9.696E-02 | 7.051E-02 | 0.000E+00 |
| 8.697E-05 | 1.419E-01 | 1.940E-01 | 1.051E-01 | 8.069E-02 | 4.398E-04 |
| 8.111E-05 | 1.419E-01 | 2.050E-01 | 1.159E-01 | 9.370E-02 | 1.435E-03 |
| 7.565E-05 | 1.419E-01 | 2.172E-01 | 1.276E-01 | 1.079E-01 | 1.275E-02 |
| 7.055E-05 | 1.419E-01 | 2.266E-01 | 1.410E-01 | 1.216E-01 | 2.808E-02 |
| 6.579E-05 | 1.419E-01 | 2.365E-01 | 1.521E-01 | 1.376E-01 | 4.116E-02 |
| 6.136E-05 | 1.419E-01 | 2.490E-01 | 1.651E-01 | 1.555E-01 | 5.560E-02 |
| 5.722E-05 | 1.419E-01 | 2.617E-01 | 1.817E-01 | 1.709E-01 | 7.289E-02 |
| 5.337E-05 | 1.419E-01 | 2.715E-01 | 1.961E-01 | 1.888E-01 | 8.951E-02 |
| 4.977E-05 | 1.419E-01 | 2.833E-01 | 2.094E-01 | 2.063E-01 | 1.127E-01 |
| 4.642E-05 | 1.419E-01 | 2.950E-01 | 2.267E-01 | 2.268E-01 | 1.445E-01 |
| 4.329E-05 | 1.419E-01 | 3.022E-01 | 2.426E-01 | 2.500E-01 | 2.039E-01 |
| 4.037E-05 | 1.419E-01 | 3.138E-01 | 2.567E-01 | 2.705E-01 | 2.676E-01 |
| 3.765E-05 | 1.419E-01 | 3.233E-01 | 2.719E-01 | 2.957E-01 | 3.469E-01 |
| 3.511E-05 | 1.419E-01 | 3.341E-01 | 2.873E-01 | 3.237E-01 | 4.195E-01 |
| 3.275E-05 | 1.419E-01 | 3.456E-01 | 3.050E-01 | 3.474E-01 | 4.878E-01 |
| 3.054E-05 | 1.419E-01 | 3.509E-01 | 3.214E-01 | 3.722E-01 | 5.420E-01 |
| 2.848E-05 | 1.419E-01 | 3.643E-01 | 3.373E-01 | 3.997E-01 | 5.961E-01 |
| 2.656E-05 | 1.419E-01 | 3.779E-01 | 3.554E-01 | 4.277E-01 | 6.539E-01 |
| 2.477E-05 | 1.419E-01 | 3.904E-01 | 3.754E-01 | 4.589E-01 | 7.197E-01 |
| 2.310E-05 | 1.419E-01 | 3.904E-01 | 3.895E-01 | 4.888E-01 | 7.759E-01 |
| 2.154E-05 | 1.419E-01 | 4.001E-01 | 4.051E-01 | 5.150E-01 | 8.208E-01 |
| 2.009E-05 | 1.419E-01 | 4.047E-01 | 4.198E-01 | 5.390E-01 | 8.559E-01 |
| 1.874E-05 | 1.419E-01 | 4.068E-01 | 4.345E-01 | 5.612E-01 | 8.864E-01 |
| 1.748E-05 | 1.419E-01 | 4.104E-01 | 4.508E-01 | 5.845E-01 | 9.097E-01 |
| 1.630E-05 | 1.419E-01 | 4.104E-01 | 4.699E-01 | 6.084E-01 | 9.378E-01 |
| 1.520E-05 | 1.419E-01 | 4.107E-01 | 4.862E-01 | 6.332E-01 | 9.599E-01 |
| 1.417E-05 | 1.419E-01 | 4.129E-01 | 4.966E-01 | 6.513E-01 | 9.713E-01 |
| 1.322E-05 | 1.419E-01 | 4.129E-01 | 5.082E-01 | 6.763E-01 | 9.768E-01 |
| 1.233E-05 | 1.419E-01 | 4.129E-01 | 5.216E-01 | 6.958E-01 | 9.792E-01 |
| 1.150E-05 | 1.419E-01 | 4.129E-01 | 5.340E-01 | 7.151E-01 | 9.850E-01 |
| 1.072E-05 | 1.419E-01 | 4.129E-01 | 5.453E-01 | 7.357E-01 | 9.908E-01 |
| 1.000E-05 | 1.419E-01 | 4.129E-01 | 5.611E-01 | 7.517E-01 | 9.945E-01 |

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| # DATA PTS= | 43382 | 42072 | 43442 | 43521 | 43201 |
| MAX # OF MISSING HRS PER DATA PT ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 6 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT TURBINE BUILDING - UNIT 2

C H I / Q  E X C E E D E D  5 0 %  O F  T H E  T I M E

| | <---------- AVERAGING PERIOD (HOURS) ---------- | | | | |
|---|---|---|---|---|---|
| | 1 | 8 | 24 | 72 | 624 |
| CHI/Q(.05)= (SEC/M**3) | 4.143E-04 | 2.715E-04 | 1.429E-04 | 1.097E-04 | 6.304E-05 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

INPUT FILES USED THIS RUN ARE:
INPUT DATA FILE NAME: MAIN.CNT
MET DATA FILE NAME: BEAVR6RO.MET
THIS FILE NAME: GASWSTOR.CHI

**********
CHI/Q AT GASEOUS WASTE STORAGE VAULT - UNIT 2
**********

BUILDING X-SECT AREA (M**2)=1.020E+01
RECEPTOR -- DIRECTION (DEG)= 52.00 -- DISTANCE (M)=5.100E+00
WINDOW (MAX DIFFERENCE BETWEEN RECEPTOR DIRECTION AND WIND DIRECTION FOR WHICH CHI/Q .NE. 0. DEGREES)= 90.0
VERTICAL DISTANCE OVER WHICH DELTA-Ts ARE MEASURED IN MET FILE (M)= 35.052

SEQUENTIAL HOURLY MET DATA FILE HAS FORMAT (F4.1,I4,F5.1)
AND CONTAINS: WIND SPEED (MI/HR), WIND DIRECTION (DEGREES),
AND VERTICAL TEMPERATURE DIFFERENCE (DEG-F)

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F R E Q U E N C Y  O F  E X C E E D I N G  G I V E N  C H I / Q
F O R  V A R I O U S  A V E R A G I N G  P E R I O D S

| CHI/Q | <---------- AVERAGING PERIOD (HOURS) ----------> | | | | |
|---|---|---|---|---|---|
| (SEC/M**3) | 1 | 8 | 24 | 72 | 624 |
| 1.000E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 9.326E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.697E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 8.111E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.565E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 7.055E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.579E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 6.136E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.722E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 5.337E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.977E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.642E-03 | 2.305E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.329E-03 | 9.220E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 4.037E-03 | 1.383E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.765E-03 | 1.614E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.511E-03 | 4.149E-04 | 7.131E-05 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.275E-03 | 1.245E-03 | 1.902E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 3.054E-03 | 2.927E-03 | 4.278E-04 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.848E-03 | 5.555E-03 | 1.450E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.656E-03 | 8.644E-03 | 2.971E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.477E-03 | 2.224E-02 | 6.370E-03 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.310E-03 | 3.928E-02 | 1.167E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.154E-03 | 5.648E-02 | 1.894E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 2.009E-03 | 7.505E-02 | 2.769E-02 | 0.000E+00 | 0.000E+00 | 0.000E+00 |
| 1.874E-03 | 9.230E-02 | 3.649E-02 | 4.604E-05 | 0.000E+00 | 0.000E+00 |
| 1.748E-03 | 1.135E-01 | 4.951E-02 | 2.072E-04 | 0.000E+00 | 0.000E+00 |
| 1.630E-03 | 1.269E-01 | 6.410E-02 | 8.747E-04 | 0.000E+00 | 0.000E+00 |
| 1.520E-03 | 1.498E-01 | 8.162E-02 | 2.854E-03 | 0.000E+00 | 0.000E+00 |
| 1.417E-03 | 1.721E-01 | 1.017E-01 | 4.995E-03 | 1.149E-04 | 0.000E+00 |
| 1.322E-03 | 1.888E-01 | 1.223E-01 | 9.438E-03 | 1.149E-03 | 0.000E+00 |
| 1.233E-03 | 2.070E-01 | 1.442E-01 | 1.450E-02 | 2.527E-03 | 0.000E+00 |
| 1.150E-03 | 2.299E-01 | 1.667E-01 | 2.060E-02 | 5.445E-03 | 0.000E+00 |
| 1.072E-03 | 2.470E-01 | 1.915E-01 | 2.887E-02 | 8.203E-03 | 0.000E+00 |
| 1.000E-03 | 2.665E-01 | 2.155E-01 | 3.989E-02 | 1.357E-02 | 0.000E+00 |

| | | | | | |
|---|---|---|---|---|---|
| 8.697E-04 | 3.038E-01 | 2.652E-01 | 6.590E-02 | 2.454E-02 | 0.000E+00 |
| 8.111E-04 | 3.229E-01 | 2.902E-01 | 8.222E-02 | 4.046E-02 | 0.000E+00 |
| 7.565E-04 | 3.344E-01 | 3.166E-01 | 1.015E-01 | 5.294E-02 | 0.000E+00 |
| 7.055E-04 | 3.636E-01 | 3.414E-01 | 1.221E-01 | 6.865E-02 | 1.389E-04 |
| 6.579E-04 | 3.807E-01 | 3.640E-01 | 1.447E-01 | 9.066E-02 | 3.796E-03 |
| 6.136E-04 | 3.915E-01 | 3.875E-01 | 1.729E-01 | 1.173E-01 | 1.905E-02 |
| 5.722E-04 | 3.958E-01 | 4.087E-01 | 1.997E-01 | 1.459E-01 | 4.055E-02 |
| 5.337E-04 | 4.016E-01 | 4.295E-01 | 2.281E-01 | 1.790E-01 | 6.143E-02 |
| 4.977E-04 | 4.036E-01 | 4.486E-01 | 2.583E-01 | 2.127E-01 | 8.384E-02 |
| 4.642E-04 | 4.048E-01 | 4.663E-01 | 2.887E-01 | 2.514E-01 | 1.160E-01 |
| 4.329E-04 | 4.066E-01 | 4.837E-01 | 3.224E-01 | 2.904E-01 | 1.503E-01 |
| 4.037E-04 | 4.077E-01 | 4.987E-01 | 3.559E-01 | 3.358E-01 | 2.348E-01 |
| 3.765E-04 | 4.079E-01 | 5.150E-01 | 3.903E-01 | 3.791E-01 | 3.471E-01 |
| 3.511E-04 | 4.079E-01 | 5.282E-01 | 4.226E-01 | 4.276E-01 | 4.648E-01 |
| 3.275E-04 | 4.079E-01 | 5.411E-01 | 4.559E-01 | 4.797E-01 | 5.774E-01 |
| 3.054E-04 | 4.079E-01 | 5.585E-01 | 4.876E-01 | 5.240E-01 | 6.744E-01 |
| 2.848E-04 | 4.079E-01 | 5.754E-01 | 5.165E-01 | 5.663E-01 | 7.549E-01 |
| 2.656E-04 | 4.079E-01 | 5.888E-01 | 5.414E-01 | 6.075E-01 | 8.254E-01 |
| 2.477E-04 | 4.079E-01 | 6.005E-01 | 5.672E-01 | 6.452E-01 | 8.807E-01 |
| 2.310E-04 | 4.079E-01 | 6.112E-01 | 5.919E-01 | 6.810E-01 | 9.301E-01 |
| 2.154E-04 | 4.079E-01 | 6.199E-01 | 6.147E-01 | 7.170E-01 | 9.643E-01 |
| 2.009E-04 | 4.079E-01 | 6.284E-01 | 6.336E-01 | 7.468E-01 | 9.808E-01 |
| 1.874E-04 | 4.079E-01 | 6.357E-01 | 6.514E-01 | 7.746E-01 | 9.910E-01 |
| 1.748E-04 | 4.079E-01 | 6.439E-01 | 6.709E-01 | 8.010E-01 | 9.967E-01 |
| 1.630E-04 | 4.079E-01 | 6.540E-01 | 6.888E-01 | 8.222E-01 | 9.986E-01 |
| 1.520E-04 | 4.079E-01 | 6.610E-01 | 7.059E-01 | 8.436E-01 | 9.999E-01 |
| 1.417E-04 | 4.079E-01 | 6.671E-01 | 7.194E-01 | 8.606E-01 | 1.000E+00 |
| 1.322E-04 | 4.079E-01 | 6.732E-01 | 7.321E-01 | 8.777E-01 | 1.000E+00 |
| 1.233E-04 | 4.079E-01 | 6.798E-01 | 7.481E-01 | 8.906E-01 | 1.000E+00 |
| 1.150E-04 | 4.079E-01 | 6.838E-01 | 7.620E-01 | 9.028E-01 | 1.000E+00 |
| 1.072E-04 | 4.079E-01 | 6.876E-01 | 7.730E-01 | 9.144E-01 | 1.000E+00 |
| 1.000E-04 | 4.079E-01 | 6.947E-01 | 7.857E-01 | 9.231E-01 | 1.000E+00 |
| 9.326E-05 | 4.079E-01 | 6.990E-01 | 7.951E-01 | 9.291E-01 | 1.000E+00 |
| 8.697E-05 | 4.079E-01 | 7.047E-01 | 8.026E-01 | 9.360E-01 | 1.000E+00 |
| 8.111E-05 | 4.079E-01 | 7.079E-01 | 8.120E-01 | 9.415E-01 | 1.000E+00 |
| 7.565E-05 | 4.079E-01 | 7.099E-01 | 8.184E-01 | 9.487E-01 | 1.000E+00 |
| 7.055E-05 | 4.079E-01 | 7.122E-01 | 8.230E-01 | 9.535E-01 | 1.000E+00 |
| 6.579E-05 | 4.079E-01 | 7.128E-01 | 8.324E-01 | 9.567E-01 | 1.000E+00 |
| 6.136E-05 | 4.079E-01 | 7.131E-01 | 8.433E-01 | 9.591E-01 | 1.000E+00 |
| 5.722E-05 | 4.079E-01 | 7.134E-01 | 8.530E-01 | 9.636E-01 | 1.000E+00 |
| 5.337E-05 | 4.079E-01 | 7.140E-01 | 8.566E-01 | 9.661E-01 | 1.000E+00 |
| 4.977E-05 | 4.079E-01 | 7.140E-01 | 8.632E-01 | 9.693E-01 | 1.000E+00 |
| 4.642E-05 | 4.079E-01 | 7.142E-01 | 8.675E-01 | 9.704E-01 | 1.000E+00 |
| 4.329E-05 | 4.079E-01 | 7.142E-01 | 8.713E-01 | 9.720E-01 | 1.000E+00 |
| 4.037E-05 | 4.079E-01 | 7.142E-01 | 8.754E-01 | 9.751E-01 | 1.000E+00 |
| 3.765E-05 | 4.079E-01 | 7.142E-01 | 8.794E-01 | 9.764E-01 | 1.000E+00 |
| 3.511E-05 | 4.079E-01 | 7.142E-01 | 8.826E-01 | 9.777E-01 | 1.000E+00 |
| 3.275E-05 | 4.079E-01 | 7.142E-01 | 8.849E-01 | 9.799E-01 | 1.000E+00 |
| 3.054E-05 | 4.079E-01 | 7.142E-01 | 8.880E-01 | 9.810E-01 | 1.000E+00 |
| 2.848E-05 | 4.079E-01 | 7.142E-01 | 8.901E-01 | 9.839E-01 | 1.000E+00 |
| 2.656E-05 | 4.079E-01 | 7.142E-01 | 8.934E-01 | 9.858E-01 | 1.000E+00 |
| 2.477E-05 | 4.079E-01 | 7.142E-01 | 8.957E-01 | 9.861E-01 | 1.000E+00 |
| 2.310E-05 | 4.079E-01 | 7.142E-01 | 8.979E-01 | 9.862E-01 | 1.000E+00 |
| 2.154E-05 | 4.079E-01 | 7.142E-01 | 9.005E-01 | 9.876E-01 | 1.000E+00 |
| 2.009E-05 | 4.079E-01 | 7.142E-01 | 9.048E-01 | 9.889E-01 | 1.000E+00 |
| 1.874E-05 | 4.079E-01 | 7.142E-01 | 9.059E-01 | 9.890E-01 | 1.000E+00 |
| 1.748E-05 | 4.079E-01 | 7.142E-01 | 9.072E-01 | 9.892E-01 | 1.000E+00 |
| 1.630E-05 | 4.079E-01 | 7.142E-01 | 9.085E-01 | 9.898E-01 | 1.000E+00 |
| 1.520E-05 | 4.079E-01 | 7.142E-01 | 9.087E-01 | 9.898E-01 | 1.000E+00 |
| 1.417E-05 | 4.079E-01 | 7.142E-01 | 9.089E-01 | 9.899E-01 | 1.000E+00 |
| 1.322E-05 | 4.079E-01 | 7.142E-01 | 9.089E-01 | 9.901E-01 | 1.000E+00 |
| 1.233E-05 | 4.079E-01 | 7.142E-01 | 9.090E-01 | 9.906E-01 | 1.000E+00 |
| 1.150E-05 | 4.079E-01 | 7.142E-01 | 9.090E-01 | 9.911E-01 | 1.000E+00 |
| 1.072E-05 | 4.079E-01 | 7.142E-01 | 9.090E-01 | 9.912E-01 | 1.000E+00 |
| 1.000E-05 | 4.079E-01 | 7.142E-01 | 9.092E-01 | 9.918E-01 | 1.000E+00 |

APPENDIX A14

Cumulative Frequency Distributions of Control Room
x/Q Values Associated with Release from Unit 2
Gaseous Waste Storage Vault of the
Beaver Valley Power Station

| # DATA PTS= | 43382 | 42072 | 43442 | 43523 | 43201 |
|---|---|---|---|---|---|
| MAX # OF MISSING HRS PER DATA PT ALLOWED | 0 | 0 | 6 | 18 | 156 |
| ACTUAL | 0 | 0 | 5 | 18 | 45 |

*** CODE CORMCHI -- 10/23/91 VERSION ***

CHI/Q AT GASEOUS WASTE STORAGE VAULT - UNIT 2

C H I / Q  E X C E E D E D  5.0 %  O F  T H E  T I M E

AVERAGING PERIOD (HOURS)

| | 1 | 8 | 24 | 72 | 624 |
|---|---|---|---|---|---|
| CHI/Q(.05)= (SEC/M**3) | 2.212E-03 | 1.743E-03 | 9.364E-04 | 7.690E-04 | 5.545E-04 |