Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

March 9, 1979

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: LaSalle County Station Units 1 and 2
Amendment No. 43 to the Final Safety
Analysis Report (FSAR)
NRC Docket Nos. 50-373/374

Dear Mr. Denton:

Attached is Amendment No. 43 to the LaSalle County Station Units 1 and 2 Final Safety Analysis Report. This amendment transmits the responses to 5 second round questions and voluntary text and response revisions.

Three (3) signed originals and fifty-seven (57) copies of this amendment are submitted for your review and approval.

Very truly yours,

C. Reed

Cordell Reed
Assistant Vice-President

attachment

SUBSCRIBED and SWORN to
before me this 9th day
of March, 1979.

Nancy M. Dascenzo
Notary Public

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LIST OF TABLES (Cont'd)

LIST OF TABLES (Cont'd)

CHAPTER 2.0 - SITE CHARACTERISTICS

LIST OF FIGURES

2.3 METEOROLOGY

This section provides a meteorological description of the site and its surrounding areas. This includes a description of general climate, a description of meteorological conditions used for design and operating-basis considerations, summaries of normal and extreme values of meteorological parameters, a discussion of the potential influence of the plant and its facilities on local meteorology, a description of the onsite meteorological measurements program, and short-term and long-term diffusion estimates. Summaries of meteorological parameters were made using data from Argonne National Laboratory (1950-1964), the first-order National Weather Service station at Peoria, Illinois (1971-1978), Dresden Station (1973-1978), and LSCS (1976-1978). Because of problems encountered with the ΔT sensors at LSCS, onsite stability data were not available for the initial submittal of the FSAR. At that time, onsite wind roses for the 8-month period May 1, 1975, through December 31, 1975, and joint frequency data from the Dresden site for 2-year period of record (January 1, 1974, through December 31, 1975) were provided.

The problems with the ΔT sensors have been resolved. Stability data defined by the temperature gradient between 33-foot and 375-foot levels have been recorded since October 1, 1976, and 2 full years (October 1, 1976, through September 30, 1978) of joint frequency data of wind speed, wind direction, and stability, defined by the 33-375-foot ΔT, are now included here.

Also presented in this section are comparisons of onsite temperature and humidity conditions with representative data from Peoria and Argonne. The onsite historical data used in this comparison is 2 years of temperature and humidity data available from the 33-foot level of the LSCS onsite meteorological tower (October 1, 1976, through September 30, 1978).

Other data sources on particular topics have been used and are specifically referenced in the text.

2.3.1 Regional Climatology

2.3.1.1 General Climate

The LSCS site is located in north central Illinois. Climate in the area is basically continental, being influenced by the full impact of weather systems that traverse the midcontinent. As a result, the site experiences a wide range of climatic conditions characterized by a high variability and a wide range of temperature extremes. For example, extreme temperatures recorded at Ottawa, Illinois, range from 112° F to -26° F (Reference 1). Monthly average temperatures in the area range from the mid-twenties in January to the mid-seventies in July.

Peoria weather data were not available for January 1952 through December 1956, Springfield, Illinois data were substituted for that period. The data consist of 3-hour interval readings for the wind speed, dry bulb, and the dew point temperatures, and cloud cover information.

Worst evaporation weather situations were obtained by selecting the weather conditions of the 30 consecutive days for which the evaporation loss was maximum. June 22, 1954, to July 21, 1954, constituted a 30-day worst-case evaporation episode. The mean dry bulb, mean dew point and mean wind speed recorded during these 30 days were 81.6° F, 63.0° F, and 9.9 mph, respectively.

A synthetic worst temperature period was made up by using the worst 24-hour period weather data for the first day and the worst consecutive 30 days for the second to thirty-first days. For the worst 24 hours (July 3, 1949) mean dry bulb, mean dew point and mean wind speed were determined to be 86.0° F, 70.8° F, and 6.3 mph, respectively. For the worst 30 days (July 4, 1955, to August 1955) the above mean conditions (dry bulb, dew point and wind speed) were determined to be 80.7° F, 70.7° F, and 8.1 mph, respectively. For details of ultimate heat sink design, see Subsection 9.2.6.

2.3.2 Local Meteorology

2.3.2.1 Data Sources

Regional meteorological data from Peoria, Argonne National Laboratory (ANL), and the Dresden Station have been compared to the LSCS site meteorological data. Peoria data have been extracted from the local climatological monthly and annual summaries which are available from the U.S. Department of Commerce, NOAA, EDS, National Climatic Center (NCC), Asheville, North Carolina (Reference 11). A 15-year (1950-1964) climatological summary compiled by ANL has also provided a comparative base for onsite meteorological measurements (Reference 18).

Commonwealth Edison Company's Dresden Station is located approximately 22 miles east of LSCS. Joint frequency distributions of wind speed, wind direction and stability for the 300-foot level of the Dresden tower for the 5-year period (December 1, 1973-November 30, 1978) have been included to represent the expected long-term conditions at the LSCS site. Joint frequency data for the Dresden 300-foot level for the period of LSCS onsite observations are also provided for a comparative analysis for the same period (October 1, 1976-September 30, 1978).

2.3.2.2 Normal and Extreme Values of Meteorological Parameters

2.3.2.2.1 Wind Summaries

At LSCS, Delta-T instrumentation for sensing the temperature difference between the 33-foot and 375-foot levels was installed in October 1976. The period of record of wind data recorded at the 375-foot level is provided (October 1, 1976, through September 30, 1978) to correspond with these available temperature gradient data for the same period.

Figures 2.3-2 through 2.3-14 consist of an annual and 12 monthly wind roses for the 375-foot level of the LSCS 400-foot onsite meteorological tower. These wind records indicate two centers of directional bias, one from the south, south-southwest, and southwest sectors, and one from the west and west-northwest sectors. The 375-foot level recorded the prevailing winds from the west-northwest 9.6% of the time, winds from the west 9.3% of the time, winds from the southwest 7.6% of the time, and winds from the south-southwest 8.8% of the time.

A wind speed of 3 m/sec or greater was recorded at the 375-foot level for 92% of the period of record (see Figure 2.3-2).

The monthly data indicate seasonal variations. Winds from the sector extending west-northwest counterclockwise to south are dominant for most of the period sampled.

The longest persistence of calm conditions observed at the LSCS 375-foot level was 5 hours on one occassion. The longest persistence of wind direction observed at the 375-foot level was one occurrence of 42 hours from the south. On two other occasions wind persistence lasted 35 hours, and on one other occasion wind persistence lasted 34 hours.

Long-term (15-year) wind roses for the 19-foot and 150-foot level wind speed and wind direction at ANL (1950-1964) are given in Table 2.2-5. Wind direction persistence at ANL for the same period and levels are presented in Table 2.3-6. A 5-year (1973-1978) period-of-record joint frequency table for the 300-foot level at Dresden is given in Table 2.3-7. In addition, a 2-year (1976-1978) period-of-record joint frequency table for the 300-foot level at Dresden is given in Table 2.3-8.

At ANL, the longest persistence of calm conditions observed at the 150-foot level was 9 hours on one occurrence. The longest persistence of wind direction at the 150-foot level was 101 hours with wind direction from the west-northwest.

The direction distributions of winds for the LSCS 2-year period, the two periods of record at Dresden, and the long-term period at ANL are all very similar. Although the prevailing wind directions vary slightly by local site and period of record, the sector extending west-northwest counterclockwise to south is dominant for all of these data sets. The prevailing wind for the LSCS 2-year period at the 375-foot level is west-northwest, while the prevailing wind for the Dresden 300-foot level for the same period of record is west. The prevailing wind for the 5-year period of record at the Dresden 300-foot level is west, and the 15-year period of record for the lower ANL level indicates a prevailing wind from the southwest.

Other than winds occurring in the sector extending west-northwest counterclockwise through south, which is dominant in the wind records at all three locations, there is a fairly uniform distribution of wind direction frequencies at the three measurement sites for all periods of record presented.

Representativeness of the LSCS Data

The reasonable (minimum) amount of meteorological data required by NRC Regulatory Guide 1.23 for use in site dispersion and accident release analyses is that gathered continuously over a representative, consecutive 12-month period. To be representative, an annual data summary must reflect the "typical" atmospheric conditions of the site area, which must be determined objectively. Objective assessment is provided for the 2-year period of the LSCS onsite record. To show the representativeness of the LSCS data, a comparative tabulation is presented of the LSCS data and meteorological data from the Dresden station. A comparison is made of the 2 years of wind and atmospheric stability data collected at the LSCS site with wind and stability data for two separate periods of record at the Dresden station. The two periods of record at Dresden presented are: A 2-year period corresponding to the LSCS 2-year period, and a 5-year period which includes the 2-year period presented for LSCS.

Detailed 375-foot wind records are available from the LSCS site for the period October 1, 1976, through September 30, 1978. Data for the same period of record are also available from the Dresden Station. In addition, wind records for a 5-year period of record (December 1, 1973, through November 30, 1978) recorded at the Dresden station 300-foot level are available for use as an approximation of long-term conditions in the site region for comparison purposes. Frequencies of occurrence (in percent) for the periods specified above are presented below for the specified wind speed intervals:

WIND SPEED (MPH)	MEASUREMENT LEVEL LSCS 375-Foot	DRESDEN 300-Foot (2 YEARS)	DRESDEN 300-Foot (5 YEARS)
CALM	0.51%	0.00%	0.00%
1-3	1.19%	2.12%	7.43%
4-7	8.62%	14.92%	13.91%
8-12	18.63%	31.01%	27.25%
13-18	26.59%	34.62%	30.39%
19-24	22.51%	12.58%	13.03%
>24	21.94%	4.23%	7.28%

The 13-18-mph wind speed class is dominant both Dresden and LSCS, although the over-19-mph speed classes are more dominant at La Salle. Obviously, the frequency distribution is shifted towards greater speeds at LSCS, where the wind speed exceeds 13 mph for 77.0% of the time and 19 mph for about 44% of the time. Clearly, the La Salle station is on the open prairie, whereas Dresden is nearer a river plain.

Figure 2.3-2 presents the 375-foot level period-of-record wind rose at LSCS. Table 2.3-8 presents the 300-foot level wind rose at Dresden corresponding to the same period of record, and Table 2.3-7 presents a 300-foot level wind rose at Dresden for the long-term period. Comparison of these wind roses shows a slight difference in the dominant wind direction. The most dominant wind directions at LSCS are WNW, W, S, and SSW, in decreasing order of frequency. At Dresden the dominant directions are W, WNW, SSW, and SW, for the same 2-year period, and W, SSW, SW, and S for the long-term period. In general, the dominant south through west-northwest sector is a common feature.

Wind direction distribution comparisons indicate the presence, during the 2-year period of record at La Salle, of an annual average wind regime similar to the long-term regime corresponding to the height of the sensor levels. The differences in wind speed frequency distributions at the two stations may in part be attributed to the 75-foot height difference between sensor levels.

A comparison of long-term and short-term atmospheric stability data at Dresden with the 2 years of onsite stability data at La Salle is presented in Subsection 2.3.2.2.6.

In summary, comparison of LSCS onsite wind rose data with wind data representing both short- and long-term periods at the Dresden station suggests that the LSCS data are representative of long-term conditions at the site. Comparison of LSCS stability data with short-term and long-term stability data for Dresden indicates that differences exist but that the short-term frequency distribution at LSCS would be similar to that for long-term conditions.

2.3.2.2.2 Temperatures

The Peoria and ANL average and extreme temperature data are presented in Table 2.3-9 in comparison with the same temperature statistics measured at the 33-foot (10-meter) level at the LSCS meteorological tower.

Temperatures from the 5.5-foot level at ANL were used. Temperature measurements at Peoria were made at the National Weather Service standard height of 4.5 feet above the surface. The 33-foot (10-meter) level at the LSCS site is reported as the standard for the NRC.

Peoria and ANL monthly temperatures, when compared with LSCS, average about the same.

The highest temperature reported at the Peoria airport during the period October 1976 through September 1978 was 100° F, and the lowest was -25° F. Extremes for the LSCS tower for the same period were 95.0° F and 20.5° F.

2.3.2.2.3 Atmospheric Moisture

2.3.2.2.3.1 Relative Humidity

The relative humidity for a given moisture content of the air is inversely proportional to the temperature cycle. A maximum relative humidity usually occurs during the early morning hours, and a minimum is typically observed in midafternoon. For the annual cycle, the lowest humidities occur in midspring, while late summer experiences the highest values. The average hourly relative humidities by month for Peoria and ANL are presented in Tables 2.3-10 and 2.3-11, respectively. Table 2.3-11 shows that for ANL, the highest average relative humidities are recorded during August between midnight and sunrise, with an average 30% change during the day. In winter the mean daily humidity ranges from about 65% to 85%. The Peoria station also observes the highest humidities (Table 2.3-10) during the later summer; however, the daylight variation averages nearly 20% during this period. The mean daily humidity range is similar to that at Argonne for the winter period.

Annual averages for the diurnal trend demonstrate nearly identical patterns at both Peoria and ANL. The seasonal trend also indicates a similar character.

Table 2.3-12 lists the monthly maximum, minimum, and average relative humidity for LSCS for the 2 years of monitoring activity (October 1, 1976-September 30, 1978). These relative humidities are calculated from the dry bulb and dew-point temperatures measured at the 33-foot tower level.

2.3.2.2.3.2 Wet Bulb Temperature

The wet bulb temperature is not as strong a function of the ambient temperature as relative humidity and will be used as one measure of the amount of water vapor in the atmosphere as it is frequently used in cooling tower studies. The wet bulb temperature is defined to be the temperature to which an air parcel may be cooled by evaporating water into it at constant pressure until it is saturated. All latent heat utilized in the process is supplied by the air parcel.

The monthly maximum, minimum, and average wet bulb temperatures for the LSCS site are shown in Table 2.3-13 for the 2 years of recorded onsite data (October 1, 1976-September 30, 1978). The wet bulb temperatures are computed as a function of the measured dew-point temperature. One dew-point sensor is located at the 33-foot level of the LSCS tower. Average hourly wet bult temperatures for ANL are shown by month in Table 2.3-14.

2.3.2.2.3.3 Dew-Point Temperature

The dew-point temperature is another measure of the amount of water vapor in the atmosphere. It is included here so that measured onsite dew-point temperatures can be compared to establish their representativeness. Dew-point temperature is defined as the temperature to which air must be cooled to produce saturation with respect to water vapor, with pressure and water vapor content remaining constant.

The dew-point temperature is lower than the wet bulb temperature except at saturation, when they are the same. The monthly maximum, minimum, and average dew-point temperatures for the 33-foot level at the LSCS site are given in Table 2.3-13. Average hourly dew points for ANL are shown by month in Table 2.3-15.

2.3.2.2.4 Precipitation

Precipitation is not monitored at the LSCS site. Long-term data from the Peoria airport and ANL were therefore used for indication of precipitation averages and extremes applicable to the region surrounding the LSCS site.

2.3.2.2.4.1 Precipitation Measured as Water Equivalent

Maximum daily amounts of precipitation (water equivalent) in inches for ANL are shown by month in Table 2.3-16. A maximum daily amount of 4.45 inches was recorded on October 10, 1954.

Maximum precipitation (water equivalent) in inches recorded for specified time intervals at ANL are shown in Table 2.3-17. The maximum 1-hour duration precipitation recorded was 2.2 inches on June 10, 1953. The maximum 48-hour duration precipitation recorded was 8.62 inches on October 9, 1954.

(visibility less than or equal to 1/4 mile) occurred at Peoria are as follows:

Month	Peoria
January	3
February	3
March	2
April	1
May	1
June	1
July	1
August	1
September	1
October	2
November	2
December	3
Yearly Average	21

2.3.2.2.6 Atmospheric Stability

Data from the LSCS meteorological tower were used to estimate stability as indicated from the temperature lapse rate. Use of a lapse rate scheme provides a direct estimate of the stability parameter. Two years of LSCS data (October 1, 1976-September 30, 1978) was utilized to provide a direct and realistic estimate of the stability parameters. Monthly and annual summaries of wind speed-wind direction-stability joint frequencies for the period are presented in Tables 2.3-20 through 2.3-32. For comparison of short-term and long-term dispersion conditions over extended periods, the joint frequency distribution data of wind speed-wind direction and Pasquill stability class (Reference 13) for the Dresden 300-foot level data defined by the 35- to 300-foot delta T are presented in Tables 2.3-7 and 2.3-8.

The percent frequencies for each stability class recorded at the LSCS site and the Dresden site, based on two complete annual cycles, are extracted below for comparison.

	A	B	C	D	E	F	G
LSCS (2 years)	3.47	3.56	4.65	45.76	24.30	14.09	4.17
Dresden (2 years)	6.62	5.69	7.32	37.90	30.12	9.82	1.98
Dresden (5 years)	5.58	4.41	5.48	34.07	31.15	9.43	9.17

At the LSCS 375-foot level, for two complete annual cycles, the joint frequency of occurrence of calm wind by stability class showed only 0.03% occurrence of calm winds associated with unstable classes (A, B, C); 0.14% occurrence of calm winds with neutral stability (D); but 0.21%, 0.07%, and 0.02% occurrence of calm winds with slightly stable, moderately stable, or extremely stable atmospheric conditions respectively. These are very small time windows.

2.3.2.3 Potential Influence of the Plant and Its Facilities on Local Meteorology

An investigation of potential fogging for the original 4480-acre lake indicated that light fog would extend to a distance of 200 meters from the lake shore on a few rare occasions (Reference 14). In the course of adapting the results of this investigation to the smaller 2190-acre lake, it was concluded that instances of fog with a visibility of 1/4 mile would be limited to a few hours per month at a distance over 200 meters from the lake shore (Reference 14). This conclusion also holds for the 2058-acre lake. Under these circumstances, the public road most likely to be affected would be subject to a maximum of a few hours per month of light fog, which would occur primarily in the hours between midnight and 6 a.m. (Reference 14).

To aid the assessment of topographic effects on the surrounding airflow regimes, reference is made to the topographic cross sections for each of the 16 compass point directions radiating 5 miles and 10 miles from the plant as provided in Figures 2.3-15 and 2.3-16 respectively. The plant, located at an elevation of approximately 710 feet, is at one of the highest points within a 5-mile radius. In the southwest quadrant, a gentle increase in elevation ranging from 725 to 750 feet is evidenced. The remaining area surrounding the plant site is characterized by a gentle slope decreasing away from the site to an elevation of 484 feet at the Illinois River, located 4.5 miles north. No large-scale topographic obstructions to favorable dispersion conditions are evident.

Figure 2.3-23 provides a general topographic description within a 10-mile radius of the plant.

2.3.3 Onsite Meteorological Measurements Program

A 400-foot meteorological tower has been erected on the site on ground approximately final plant grade, 710 MSL, at the location shown in Figure 2.1-3. The tower is 215 feet from the nearest building, which is approximately 22 feet tall, 50 wide, and 215 feet long. It is about 670 feet from the plant turbine building and 900 feet from the reactor building. These distances are essentially in compliance with the NRC's suggestion that the meteorological tower be located 5 building heights away from the nearest plant structures. The turbine building is about 134 feet high, and the reactor building is about 185 feet high. Onsite data collection began on May 1, 1975.

The tower is instrumented at three levels: 33 feet, where dry bulb and dew-point temperatures are measured; 200 feet, where differential (referenced to 33 feet) and dew-point temperatures and wind speed and wind direction are measured; and 375 feet, where wind speed, wind direction, and differential temperature are measured. In May 1978 the wind sensors were moved from the 33-foot level to the 200-foot level of the tower to provide backup data for the 375-foot wind sensors.

All data are recorded in digital form on magnetic recording tape. A complete analog recording system is used to provide continuous strip-chart records of each variable. Wind speed and wind direction from the 375-foot level and differential temperature between the 33-foot and 375-foot levels are transmitted to the control room for use during plant operation.

Meteorological data collected on the analog charts and magnetic tape are processed weekly. These data are used to generate wind roses and to provide estimates of airborne concentrations of gaseous effluents. At the end of each year, all of the hourly collected meteorological data are tabulated on magnetic computer tape and microfiche.

The meteorological data collection program will continue through plant construction, testing, and operation. The recommendations of Regulatory Guide 1.23 were followed in the selection and installation of equipment and in the reduction and processing of data. The onsite meteorological monitoring program is continuing. Instrument calibrations and data consistency evaluations are made routinely each month.

2.3.3.1 Instrumentation

Sensing instruments were installed on the tower, and recording equipment was installed in the meteorological shed in April 1975. Data recovery began on May 1, 1975. The meteorological shed is 50 feet from the tower. All sensors are oriented to the prevailing wind at the site.

section. These calculations were performed using appropriate atmospheric dispersion models assuming an elevated release with plume rise. The results indicate the conservative nature of the meteorological parameters of Regulatory Guide 1.3 (Rev. 2).

2.3.4.2 Calculations

Short-term (accident) diffusion estimates are used to evaluate the potential severity of an accident during a year of "typical" weather conditions. In order to evaluate the impact of an accident at LSCS, conservative and realistic estimates of atmospheric dilution factors (χ/Q) are calculated. These dilution factors are then used in calculating the radiological dose rates listed in Chapter 15.0.

Since the station vent stack height is greater than twice the reactor building height, the atmospheric dilution factors at ground level for LSCS were calculated by use of Gaussian plume diffusion models for an elevated, continuously emitting point source. The centerline diffusion model is used for time periods up to 8 hours and the sector average diffusion model for time periods greater than 8 hours. Plume rise is accounted for by use of Briggs' (Reference 17) formulas for momentum-dominated plumes. Cumulative frequency distribution of time-period averaged χ/Q values was prepared, and values that were exceeded 5% and 50% of the time were derived. Details of the models and the cumulative frequency distribution analysis are presented in Subsection 2.3.4.3.

In the short-term diffusion estimates, hourly χ/Q values were computed from the concurrent hourly mean values of wind speed, wind direction, and Pasquill stability class of the LSCS meteorological tower data for the period of October 1, 1976, through September 30, 1978. The wind speed and wind direction at the 375-foot level were used in the diffusion estimates for the elevated release. The Pasquill stability class was determined from the measured vertical temperature difference (ΔT) between the 33-foot and 375-foot levels of the meteorological tower. When a recorded hourly wind speed was less than the threshold speed of the wind sensor, a minimum wind speed of 0.15 m/sec (one-half of the threshold speed) and a wind direction that occurred in the previous hour were used for the hour.

Short-term diffusion calculations were made to determine the 5% and 50% χ/Q values for accident time periods of 0-1 hour, 0-2 hours, 0-8 hours, 8-24 hours, 1-4 days, and 4-26 days at the exclusion area boundary (EAB), the actual site boundary (ASB), and the low population zone (LPZ) boundary, as well as at distances of 0.5, 1.5, 2.5, 3.5, 4.5, 7.5, 15.0, 25.0, 35.0, and 45.0 miles from the plant center for effluents released from the station vent stack and the standby gas treatment system (SGTS) vent (located within the stack). The 5% and 50% χ/Q values for

2.3.5 Long-Term (Routine) Diffusion Estimates

2.3.5.1 Objective

For routine effluent releases, the annual average atmospheric dilution factors for an elevated release were made by use of LSCS meteorological tower data from October 1, 1976, through September 30, 1978, for effluents released from both the station vent stack and the SGTS vent.

2.3.5.2 Calculations

Annual average χ/Q values were computed for actual site boundary distances as well as the following radial distances: 0.5, 1.5, 2.5, 3.5, 4.5, 7.5, 15.0, 25.0, 35.0, and 45.0 miles. The joint frequency distribution data of wind direction and wind speed by atmospheric stability class from the LSCS meteorological tower at the 375-foot level, given in Table 2.3-32, are used as meteorological data input for annual average diffusion estimates. Calms are assigned a wind speed of one-half the threshold speed of the vane or anemometer (whichever is higher) and a wind direction in proportion to the directional distribution, within a stability class, of the lowest non-calm wind speed category.

Ground-level sector average values of χ/Q based on the joint frequency statistics of wind and stability are computed from the following equation:

$$(\chi/Q)_i = 2.032 \sum_k \sum_j \frac{Fijk}{xU_j\sigma_{zk}} \exp\left[-\frac{1}{2}\left(\frac{h_e}{\sigma_{zk}}\right)^2\right] \qquad (2.3\text{-}12)$$

where:

$(\chi/Q)_i$ = annual average relative ground-level concentrations (sec/m³) in the ith downwind sector,

Fijk = joint frequency distribution at ith wind direction, jth wind wind speed category, and kth stability class,

x = downwind distance (meters),

U_j = mean wind speed in the jth wind speed category (m/sec),

σ_{zk} = vertical diffusion parameter at distance x for the kth stability class (meters), and

h_e = effective plume height (meters).

Annual χ/Q calculations for LSCS were made using the methods of NRC Regulatory Guide 1.111. Use of these methods limits modeled release levels to a maximum height of 100 meters. Although the

TABLE 2.3-7

THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION

AND PASQUILL STABILITY CLASS FOR 300-FT LEVEL AT DRESDEN STATION FOR

5-YEAR PERIOD (DECEMBER 1, 1973 - NOVEMBER 30, 1978)

SPEED CLASS		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
.9-3	EU	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.00	0.03	0.03							
	MU	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00	0.01	0.08		0.08						
	SU	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.09			0.09					
	N	0.03	0.02	0.03	0.05	0.05	0.03	0.06	0.06	0.04	0.05	0.08	0.07	0.03	0.04	0.05	0.04	0.73				0.73				
	SS	0.59	0.26	0.18	0.35	0.29	0.15	0.09	0.11	0.07	0.06	0.06	0.09	0.07	0.10	0.05	0.05	2.57					2.57			
	MS	0.06	0.05	0.03	0.03	0.02	0.00	0.02	0.02	0.04	0.01	0.04	0.01	0.03	0.02	0.02	0.01	0.41						0.41		
	ES	1.38	0.55	0.04	0.12	0.19	0.17	0.16	0.16	0.20	0.09	0.10	0.09	0.08	0.03	0.08	0.08	3.52							3.52	7.43
4-7	EU	0.10	0.09	0.07	0.03	0.07	0.05	0.08	0.06	0.05	0.05	0.05	0.09	0.09	0.09	0.07	0.10	1.14	1.14							
	MU	0.05	0.05	0.04	0.06	0.07	0.05	0.10	0.07	0.05	0.04	0.05	0.06	0.07	0.05	0.04	0.05	0.90		0.90						
	SU	0.06	0.05	0.03	0.05	0.08	0.06	0.06	0.06	0.08	0.08	0.07	0.05	0.09	0.06	0.09	0.07	1.04			1.04					
	N	0.24	0.20	0.24	0.38	0.26	0.32	0.33	0.37	0.33	0.26	0.34	0.41	0.33	0.25	0.24	0.26	4.76				4.76				
	SS	0.19	0.15	0.18	0.29	0.15	0.20	0.29	0.25	0.21	0.22	0.27	0.23	0.29	0.22	0.16	0.17	3.47					3.47			
	MS	0.09	0.12	0.10	0.10	0.06	0.08	0.10	0.13	0.09	0.09	0.11	0.17	0.12	0.15	0.12	0.08	1.71						1.71		
	ES	0.11	0.11	0.03	0.04	0.04	0.02	0.04	0.05	0.05	0.05	0.06	0.08	0.04	0.09	0.05	0.03	0.89							0.89	13.91
8-12	EU	0.18	0.25	0.14	0.12	0.08	0.03	0.06	0.08	0.10	0.06	0.07	0.07	0.17	0.15	0.21	0.17	1.94	1.94							
	MU	0.07	0.11	0.08	0.07	0.07	0.06	0.09	0.12	0.10	0.10	0.08	0.11	0.12	0.06	0.08	0.09	1.41		1.41						
	SU	0.07	0.09	0.11	0.13	0.11	0.10	0.14	0.11	0.11	0.10	0.07	0.13	0.12	0.12	0.06	0.12	1.69			1.69					
	N	0.61	0.57	0.75	0.73	0.70	0.41	0.50	0.53	0.68	0.54	0.58	0.58	0.64	0.61	0.52	0.63	9.60				9.60				
	SS	0.56	0.41	0.51	0.38	0.50	0.46	0.65	0.52	0.49	0.67	0.63	0.53	0.66	0.46	0.45	0.35	8.23					8.23			
	MS	0.10	0.09	0.11	0.05	0.08	0.10	0.18	0.24	0.18	0.23	0.31	0.33	0.33	0.22	0.19	0.13	2.87						2.87		
	ES	0.12	0.16	0.06	0.05	0.05	0.03	0.06	0.06	0.08	0.09	0.15	0.18	0.17	0.08	0.10	0.07	1.51							1.51	27.25
13-18	EU	0.10	0.09	0.15	0.04	0.05	0.03	0.03	0.04	0.08	0.13	0.09	0.07	0.10	0.18	0.21	0.16	1.55	1.55							
	MU	0.08	0.10	0.05	0.06	0.03	0.03	0.06	0.04	0.11	0.13	0.09	0.09	0.12	0.11	0.09	0.12	1.31		1.31						
	SU	0.07	0.09	0.08	0.11	0.05	0.05	0.09	0.08	0.09	0.08	0.11	0.10	0.15	0.15	0.14	0.12	1.56			1.56					
	N	0.56	0.57	0.68	0.51	0.52	0.30	0.41	0.56	0.81	0.84	0.74	0.57	0.98	1.11	0.84	0.71	10.71				10.71				
	SS	0.53	0.43	0.24	0.18	0.37	0.49	0.50	0.60	0.97	1.19	1.10	0.54	0.94	0.88	0.75	0.52	10.23					10.23			
	MS	0.17	0.15	0.06	0.01	0.05	0.10	0.23	0.17	0.30	0.45	0.59	0.45	0.30	0.18	0.21	0.16	3.58						3.58		
	ES	0.19	0.13	0.05	0.07	0.05	0.05	0.08	0.03	0.07	0.12	0.14	0.14	0.14	0.05	0.05	0.09	1.45							1.45	30.39
19-24	EU	0.01	0.05	0.03	0.03	0.03	0.04	0.00	0.00	0.05	0.05	0.06	0.03	0.06	0.12	0.04	0.02	0.62	0.62							
	MU	0.02	0.03	0.03	0.02	0.02	0.00	0.00	0.01	0.06	0.05	0.04	0.03	0.07	0.08	0.02	0.05	0.53		0.53						
	SU	0.03	0.03	0.03	0.01	0.01	0.01	0.01	0.02	0.06	0.08	0.08	0.02	0.07	0.08	0.10	0.09	0.73			0.73					
	N	0.24	0.21	0.24	0.13	0.16	0.17	0.15	0.20	0.51	0.57	0.41	0.33	0.72	0.58	0.40	0.31	5.33				5.33				
	SS	0.13	0.21	0.03	0.05	0.10	0.11	0.16	0.31	0.62	0.65	0.41	0.26	0.45	0.39	0.22	0.12	4.22					4.22			
	MS	0.06	0.04	0.00	0.00	0.00	0.00	0.02	0.03	0.16	0.19	0.09	0.08	0.02	0.07	0.01	0.03	0.80						0.80		
	ES	0.12	0.12	0.02	0.03	0.06	0.05	0.04	0.03	0.05	0.10	0.07	0.02	0.02	0.01	0.03	0.03	0.80							0.80	13.03
25-31	EU	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.01	0.01	0.02	0.02	0.00	0.00	0.12	0.12							
	MU	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.02	0.01	0.03	0.03	0.00	0.00	0 13		0.13						
	SU	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.03	0.04	0.07	0.00	0.01	(.25			0.25					
	N	0.07	0.04	0.07	0.02	0.03	0.08	0.08	0.09	0.25	0.29	0.22	0.19	0.29	0.16	0.05	0.10	.03				2.03				
	SS	0.06	0.15	0.00	0.00	0.01	0.01	0.05	0.12	0.22	0.36	0.14	0.07	0.14	0.08	0.01	0.00	1.42					1.42			
	MS	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01						0.01		
	ES	0.12	0.07	0.07	0.09	0.08	0.08	0.05	0.03	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.01	0.70							0.70	4.66

TABLE 2.3-7 (Cont'd)

SPEED CLASS		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
		DIRECTION CLASS																	STABILITY CLASS							
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.02							
3	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.02		0.02						
2	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.04	0.00	0.00	0.06			0.06					
-	N	0.02	0.03	0.01	0.00	0.01	0.01	0.01	0.02	0.05	0.04	0.07	0.07	0.08	0.05	0.00	0.00	0.47				0.47				
3	SS	0.15	0.07	0.01	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.03	0.02	0.03	0.00	0.00	0.00	0.41					0.41			
8	MS	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03						0.03		
	ES	0.03	0.02	0.02	0.03	0.03	0.01	0.00	0.02	0.02	0.00	0.01	0.02	0.00	0.02	0.02	0.00	0.25							0.25	1.26
	EU	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02							
3	MU	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01		0.01						
9	SU	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.03			0.03					
-	N	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	0.00	0.00	0.00	0.16				0.16				
4	SS	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.19					0.19			
6	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00							0.00	0.41
	EU	0.06	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14							
G	MU	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02		0.02						
T	SU	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03			0.03					
	N	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28				0.28				
4	SS	0.22	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41					0.41			
5	MS	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02						0.02		
	ES	0.02	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05							0.05	0.95
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00						
C	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00					
A	N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00				
L	SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00			
M	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00
TOT		8.16	6.54	4.64	4.44	4.54	3.96	4.99	5.41	7.55	8.27	7.76	6.46	8.30	7.32	5.79	5.16	99.29	5.58	4.41	5.48	34.07	31.15	9.43	9.17	99.29
S	EU	0.47	0.57	0.40	0.22	0.23	0.16	0.17	0.18	0.31	0.31	0.31	0.27	0.44	0.56	0.53	0.45	5.58								
U	MU	0.25	0.32	0.20	0.21	0.19	0.16	0.25	0.24	0.33	0.33	0.30	0.31	0.42	0.35	0.23	0.32	4.41								
B	SU	0.28	0.28	0.27	0.31	0.26	0.22	0.31	0.27	0.36	0.39	0.36	0.34	0.49	0.54	0.39	0.41	5.48								
-	N	2.01	1.81	2.02	1.82	1.73	1.32	1.54	1.83	2.67	2.59	2.46	2.23	3.09	2.80	2.10	2.05	34.07								
T	SS	2.56	1.90	1.16	1.25	1.42	1.42	1.74	1.92	2.62	3.21	2.64	1.74	2.59	2.13	1.64	1.21	31.15								
O	MS	0.50	0.49	0.30	0.19	0.21	0.28	0.55	0.59	0.77	0.97	1.14	1.04	0.80	0.64	0.55	0.41	9.43								
T	ES	2.09	1.17	0.29	0.44	0.50	0.40	0.43	0.38	0.49	0.47	0.55	0.53	0.47	0.30	0.35	0.31	9.17								

Stability is based on 35-300 foot Delta-T.

TABLE 2.3-8

THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION

AND PASQUILL STABILITY CLASS FOR 300-FOOT LEVEL AT DRESDEN STATION FOR

2-YEAR PERIOD (OCTOBER 1, 1976 - SEPTEMBER 30, 1978)

SPEED LASS		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
	EU	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	0.03							
.	MU	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.06		0.06						
9	SU	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.06			0.06					
-	N	0.03	0.04	0.04	0.05	0.05	0.03	0.07	0.07	0.03	0.02	0.12	0.14	0.04	0.07	0.05	0.03	0.88				0.88				
3	SS	0.05	0.01	0.05	0.05	0.05	0.07	0.00	0.06	0.05	0.05	0.06	0.11	0.05	0.09	0.02	0.02	0.79					0.79			
	MS	0.00	0.00	0.02	0.01	0.03	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.00	0.03	0.03	0.00	0.19						0.19		
	ES	0.06	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.11							0.11	2.12
	EU	0.11	0.11	0.08	0.04	0.07	0.06	0.07	0.07	0.05	0.05	0.05	0.09	0.11	0.12	0.08	0.12	1.28	1.28							
	MU	0.06	0.06	0.05	0.04	0.07	0.07	0.06	0.09	0.03	0.03	0.08	0.07	0.09	0.07	0.01	0.07	0.95		0.95						
4	SU	0.08	0.03	0.03	0.08	0.09	0.09	0.05	0.09	0.05	0.08	0.11	0.07	0.12	0.05	0.09	0.07	1.18			1.18					
-	N	0.21	0.16	0.27	0.37	0.24	0.41	0.42	0.39	0.34	0.34	0.48	0.67	0.43	0.22	0.25	0.19	5.41				5.41				
7	SS	0.20	0.16	0.20	0.37	0.18	0.25	0.26	0.21	0.24	0.34	0.41	0.36	0.35	0.18	0.17	0.16	4.04					4.04			
	MS	0.05	0.12	0.14	0.09	0.07	0.05	0.09	0.08	0.09	0.09	0.10	0.19	0.11	0.12	0.15	0.11	1.65						1.65		
	ES	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.02	0.03	0.03	0.03	0.05	0.03	0.06	0.04	0.03	0.41							0.41	14.92
	EU	0.23	0.16	0.16	0.16	0.09	0.02	0.10	0.14	0.14	0.08	0.08	0.05	0.22	0.22	0.27	0.29	2.41	2.41							
	MU	0.09	0.14	0.07	0.07	0.12	0.06	0.13	0.22	0.14	0.12	0.08	0.09	0.19	0.09	0.13	0.12	1.86		1.86						
8	SU	0.09	0.12	0.14	0.18	0.18	0.12	0.24	0.20	0.17	0.11	0.05	0.16	0.16	0.14	0.07	0.18	2.31			2.31					
-	N	0.60	0.53	0.80	0.84	0.68	0.51	0.61	0.69	0.72	0.72	0.89	0.79	0.85	0.74	0.60	0.68	11.25				11.25				
1	SS	0.32	0.35	0.57	0.36	0.55	0.49	0.68	0.63	0.53	0.83	0.75	0.74	0.89	0.48	0.51	0.30	8.98					8.98			
2	MS	0.11	0.09	0.12	0.07	0.05	0.07	0.23	0.24	0.19	0.26	0.50	0.40	0.41	0.21	0.30	0.22	3.47						3.47		
	ES	0.05	0.07	0.02	0.02	0.00	0.00	0.03	0.01	0.05	0.05	0.10	0.12	0.08	0.03	0.02	0.08	0.73							0.73	31.01
	EU	0.05	0.08	0.11	0.05	0.03	0.03	0.05	0.06	0.13	0.12	0.08	0.03	0.11	0.27	0.32	0.22	1.74	1.74							
1	MU	0.07	0.10	0.08	0.13	0.05	0.04	0.07	0.08	0.16	0.17	0.10	0.11	0.20	0.16	0.08	0.17	1.77		1.77						
3	SU	0.10	0.12	0.11	0.16	0.07	0.06	0.16	0.12	0.12	0.10	0.14	0.18	0.19	0.19	0.18	0.12	2.12			2.12					
-	N	0.61	0.56	0.71	0.44	0.49	0.31	0.52	0.82	1.05	0.94	0.94	0.70	1.33	1.35	1.16	0.91	12.84				12.84				
1	SS	0.35	0.36	0.16	0.10	0.25	0.49	0.65	0.93	1.29	1.27	1.16	0.51	1.20	1.27	1.04	0.64	11.67					11.67			
8	MS	0.20	0.09	0.06	0.01	0.02	0.08	0.35	0.18	0.24	0.48	0.71	0.36	0.35	0.24	0.28	0.21	3.86						3.86		
	ES	0.07	0.05	0.01	0.01	0.00	0.03	0.02	0.00	0.01	0.11	0.05	0.08	0.03	0.07	0.04	0.04	0.62							0.62	34.62
	EU	0.01	0.04	0.04	0.07	0.01	0.05	0.00	0.00	0.10	0.06	0.03	0.03	0.16	0.28	0.07	0.03	0.98	0.98							
1	MU	0.03	0.04	0.06	0.05	0.01	0.00	0.01	0.00	0.08	0.05	0.05	0.07	0.12	0.15	0.04	0.10	0.86		0.86						
9	SU	0.01	0.05	0.07	0.03	0.00	0.01	0.01	0.04	0.07	0.05	0.05	0.04	0.16	0.16	0.14	0.12	1.01			1.01					
-	N	0.14	0.21	0.26	0.12	0.07	0.22	0.22	0.25	0.48	0.56	0.38	0.37	0.81	0.68	0.39	0.27	5.43				5.43				
2	SS	0.09	0.11	0.01	0.00	0.01	0.04	0.09	0.35	0.51	0.58	0.30	0.30	0.53	0.31	0.20	0.11	3.54					3.54			
4	MS	0.05	0.05	0.01	0.00	0.00	0.00	0.01	0.00	0.09	0.14	0.07	0.06	0.03	0.12	0.02	0.02	0.67						0.67		
	ES	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.09							0.09	12.58
	EU	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.01	0.03	0.05	0.00	0.00	0.16	0.16							
2	MU	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.05	0.06	0.00	0.00	0.17		0.17						
5	SU	0.03	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.05	0.05	0.09	0.14	0.00	0.02	0.46			0.46					
	N	0.04	0.00	0.04	0.00	0.01	0.09	0.15	0.04	0.22	0.24	0.19	0.15	0.34	0.19	0.05	0.07	1.82				1.82				
3	SS	0.02	0.03	0.00	0.00	0.00	0.01	0.07	0.10	0.05	0.33	0.11	0.09	0.16	0.00	0.00	0.00	0.97					0.97			
1	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01						0.01		
	ES	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01							0.01	3.60

TABLE 2.3-8 (Cont'd)

	SPEED CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
																			STABILITY CLASS							
									DIRECTION CLASS																	
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.02							
3	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02		0.02						
2	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.00	0.00	0.12			0.12					
-	N	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.04	0.02	0.03	0.03	0.03	0.07	0.00	0.00	0.27				0.27				
3	SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.03	0.05	0.00	0.01	0.01	0.00	0.00	0.00	0.11					0.11			
8	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01							0.01	0.55
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
3	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00						
9	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.06			0.06					
-	N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00				
4	SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02					0.02			
6	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.08
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
G	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00						
T	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0^	0.00	0.00			0.00					
	N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00				0.00				
4	SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00			
5	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00
	EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00						
C	SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00					
A	N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00				
L	SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00			
M	MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00		
	ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00	0.00
	TOT	4.26	4.11	4.53	3.99	3.56	3.82	5.51	6.20	7.58	8.62	8.42	7.33	10.15	8.85	6.81	5.74	99.48	6.62	5.69	7.32	37.90	30.12	9.85	1.98	99.48
S	EU	0.42	0.41	0.39	0.32	0.20	0.16	0.22	0.27	0.45	0.31	0.27	0.22	0.64	0.94	0.74	0.66	6.62								
U	MU	0.25	0.35	0.26	0.30	0.25	0.17	0.27	0.39	0.41	0.39	0.31	0.37	0.68	0.55	0.26	0.48	5.59								
B	SU	0.31	0.32	0.38	0.45	0.36	0.28	0.47	0.45	0.41	0.40	0.40	0.50	0.77	0.83	0.48	0.51	7.32								
-	N	1.63	1.50	2.12	1.82	1.54	1.62	2.01	2.26	2.88	2.84	3.03	2.85	3.83	3.32	2.50	2.15	37.90								
T	SS	1.03	1.02	0.99	0.88	1.04	1.35	1.75	2.29	2.70	3.47	2.79	2.12	3.19	2.33	1.94	1.23	30.12								
O	MS	0.41	0.35	0.35	0.18	0.17	0.20	0.70	0.50	0.63	0.97	1.41	1.02	0.90	0.72	0.78	0.56	9.85								
T	ES	0.21	0.16	0.04	0.04	0.00	0.04	0.09	0.04	0.10	0.24	0.21	0.25	0.14	0.16	0.11	0.15	1.98								

Stability is based on 35-300 foot Delta-T.

TABLE 2.3-9

COMPARISON OF LA SALLE COUTNY STATION 33-FOOT LEVEL TEMPERATURES (°F)

(OCTOBER 1976-SEPTEMBER 1978) WITH AVERAGE AND EXTREME TEMPERATURE DATA FROM PEORIA

(OCTOBER 1976-SEPTEMBER 1978) AND ARGONNE (1950-1964)

	AVERAGE			MAXIMUM			MINIMUM		
MONTH*	LA SALLE	PEORIA	ARGONNE**	LA SALLE	PEORIA	ARGONNE	LA SALLE	PEORIA	ARGONNE
January	10.9	11.0	21.0	35.5	39.0	65.0(1950)	-20.5	-25.0	-20.0(1963)
February	20.7	21.2	26.0	59.2	65.0	67.0(1954)	- 9.9	-13.0	-16.0(1951)
March	37.7	38.5	33.0	75.6	74.0	79.0(1963)	- 2.8	- 6.0	- 9.0(1960)
April	52.8	54.2	47.0	84.9	86.0	84.0(1962)	27.6	27.0	14.0(1957)
May	64.3	64.5	58.0	92.4	91.0	90.0(1952) (1964)	31.4	32.0	27.0(1963)
June	69.3	70.8	68.0	93.1	98.0	96.0(1953)	44.5	44.0	34.0(1963)
July	73.8	76.6	71.0	95.0	100.0	101.0(1956)	52.5	50.0	45.0(1963)
August	70.5	72.3	70.0	88.1	92.0	96.0(1956)	52.7	50.0	41.0(1963)
September	67.1	68.5	63.0	93.3	95.0	96.0(1953)	43.2	41.0	32.0(1956)
October	50.3	49.3	53.0	87.4	87.0	89.0(1963)	25.8	20.0	16.0(1952) (1962)
November	35.7	36.2	37.0	69.7	71.0	77.0(1950)	- 2.4	- 2.0	- 2.0(1950) (1958)
December	20.7	21.9	25.0	51.1	54.0	62.0(1951)	-14.3	-11.0	-18.0(1958) (1960)
Entire Record***	47.5	48.8	47.7	95.0	100.0	101.0(1956)	-20.5	-25.0	-20.0(1963)

*Each month consists of data from a combination of 2 months during the period October 1, 1976 through September 30, 1978.

**Average data for Argonne are based upon the period 1950-1964 as indicated in table title.

***Entire record consists of the period October 1, 1976 through September 30, 1978.

TABLE 2.3-12

MONTHLY MAXIMUM, MINIMUM, AND AVERAGE RELATIVE HUMIDITIES (%)

FOR THE LA SALLE COUNTY STATION*

MONTH **	MAXIMUM	MINIMUM	AVERAGE
January	100.0	54.6	86.3
February	100.0	40.8	82.0
March	100.0	18.0	73.4
April	100.0	17.5	62.6
May	100.0	16.9	63.0
June	100.0	20.9	65.0
July	100.0	33.4	79.5
August	100.0	33.7	78.0
September	100.0	21.7	75.5
October	100.0	18.6	70.3
November	100.0	22.7	66.8
December	100.0	31.2	78.5

*Measurements taken at the 33-foot level.

**Data for each month consists of a combination of data for 2 months during the period October 1, 1976 through September 30, 1978.

TABLE 2.3-13

MONTHLY MAXIMUM, MINIMUM, AND AVERAGE WET BULB AND DEW-POINT TEMPERATURES (°F)

FOR THE LA SALLE COUNTY STATION*

MONTH**	MAXIMUM		MINIMUM		AVERAGE	
	WET BULB	DEW-POINT	WET BULB	DEW-POINT	WET BULB	DEW-POINT
January	34.2	34.0	-20.5	-20.8	10.1	7.5
February	53.4	51.2	- 9.9	-10.0	19.2	15.8
March	62.5	58.2	- 2.8	- 2.8	34.3	29.2
April	66.7	62.6	27.6	2[illegible].3	45.9	38.3
May	73.9	69.8	31.4	28.2	56.0	49.6
June	87.1	86.8	44.5	41.4	61.1	55.4
July	92.9	92.9	52.5	50.9	68.9	66.4
August	79.2	77.6	52.7	51.4	65.4	62.7
September	76.7	75.2	43.2	42.2	32.0	57.9
October	65.5	62.4	25.8	24.0	45.3	39.8
November	63.8	60.6	- 2.4	- 2.5	31.9	25.1
December	46.4	46.2	-14.3	-14.5	18.9	14.7

*Measurements taken at the 33-foot level.

**Monthly data are combinations of data for 2 months during period October 1, 1976 through September 30, 1978.

AMENDMENT 43
MARCH 1979

TABLE 2.3-20

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT 'A SALLE COUNTY STATION (JANUARY)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.0C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
A	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	C.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	00.17
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	00.17
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	$ 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
B	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.C0	0.00	0.00	0.25	0.08	0.00	00.33
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.08	0.00	00.33
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.17
C	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.08
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	00.08
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	00.17
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.33	0.08	0.17	0.00	00.75
	TOTALS	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.25	0.42	0.08	0.17	0.00	01.25
	CALM																	00.00
	1-3	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0C	0.00	0.00	0.00	0.08	0.00	0.08	00.25
	4-7	0.08	0.00	0.17	0.25	0.17	0.08	0.08	0.00	0.00	0.17	0.33	0.25	0.08	0.58	0.17	0.00	02.42
D	8-12	1.84	1.00	0.67	0.67	0.08	0.00	0.00	0.42	0.83	1.09	0.58	0.50	1.09	1.00	0.50	0.75	11.02
	13-18	2.09	1.75	1.00	0.25	0.33	0.00	0.00	0.25	1.34	1.50	1.50	0.92	1.17	1.17	0.25	0.92	14.44
	19-24	2.09	0.42	0.50	0.33	0.00	0.00	0.25	0.42	1.50	0.67	0.33	1.00	2.09	1.67	1.09	2.09	14.44
	>24	0.08	0.00	0.17	0.00	0.00	0.00	0.08	0.17	0.58	0.25	0.50	1.92	3.76	3.92	0.58	0.17	12.19
	TOTALS	6.18	3.26	2.50	1.50	0.58	0.08	0.42	1.25	4.26	3.67	3.26	4.59	8.18	8.43	2.59	4.01	54.76
	CALM																	00.08
	1-3	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.08	00.33
	4-7	0.08	0.25	0.17	0.00	0.08	0.08	0.00	0.17	0.17	0.25	0.00	0.08	0.08	0.17	0.33	0.33	02.25
E	8-12	0.17	0.25	0.33	0.00	0.25	0.00	0.00	0.33	0.25	0.17	1.25	0.42	0.50	0.58	0.08	0.17	04.76
	13-18	0.00	0.50	0.42	0.00	0.25	0.00	0.00	0.08	0.42	0.75	0.17	1.09	0.50	1.00	0.42	0.33	05.93
	19-24	0.17	0.25	0.17	0.00	0.00	0.00	[illegible].08	0.08	0.50	0.25	0.00	0.67	1.09	1.75	0.58	0.08	05.68
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.50	0.25	1.75	2.75	3.67	0.25	0.00	09.85
	TOTALS	0.50	1.25	1.09	0.00	0.58	0.08	0.08	0.67	2.00	1.92	1.67	4.01	5.01	7.26	1.67	1.00	23.88

TABLE 2.3-20 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.08
	1-3	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.08	0.17	0.00	0.00	0.00	0.00	0.08	0.17	0.08	0.00	0.17	0.00	0.00	00.75
F	8-12	0.00	0.08	0.00	0.00	0.08	0.00	0.00	0.08	0.25	0.08	0.08	0.00	0.17	0.17	0.00	0.00	01.00
	13-18	0.00	0.08	0.25	0.00	0.00	0.00	0.00	0.25	0.42	0.00	0.00	0.33	0.58	0.42	0.42	0.00	02.75
	19-24	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.17	0.42	0.08	0.00	0.17	0.58	0.58	1.59	0.17	04.01
	>24	0.17	0.00	0.08	0.00	0.00	0.00	0.00	0.17	0.50	0.25	0.00	0.00	0.42	0.58	0.08	0.08	02.34
	TOTALS	0.17	0.17	0.58	0.08	0.25	0.00	0.00	0.67	1.59	0.50	0.25	0.58	1.75	1.92	2.09	0.25	10.93
	CALM																	00.17
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.08
G	8-12	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.17	0.00	0.00	0.00	0.00	00.92
	13-18	0.00	0.17	0.00	0.08	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.25	0.08	0.17	0.00	00.92
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.00	0.00	0.25	0.25	0.00	00.83
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.25	0.00	0.00	0.00	0.17	0.00	00.75
	TOTALS	0.00	0.58	0.33	0.08	0.00	0.00	0.00	0.25	0.08	0.50	0.33	0.17	0.25	0.33	0.58	0.00	03.67

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976-September 30, 1978).

TABLE 2.3-21

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (FEBRUARY)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
A	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
B	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	00.09
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	00.09
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
C	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00	00.46
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.09	0.00	0.19	0.19	0.00	0.09	0.00	00.74
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	00.09
	TOTALS	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.19	0.00	0.19	0.19	0.00	0.19	0.00	01.30
	CALM																	00.37
	1-3	0.00	0.09	0.00	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.46
	4-7	0.46	0.65	0.74	0.56	0.46	0.09	0.00	0.19	0.19	0.19	0.37	0.65	0.46	0.19	0.19	0.00	05.39
D	8-12	0.65	0.74	0.09	0.84	0.19	0.00	0.28	0.46	0.65	0.28	0.65	0.65	0.74	1.77	0.56	1.02	09.57
	13-18	1.21	0.56	0.09	0.00	0.00	0.00	0.00	0.65	1.49	0.09	0.37	1.02	1.02	0.74	1.77	2.97	11.99
	19-24	0.00	0.19	0.19	0.00	0.09	0.00	0.09	1.49	0.93	0.00	0.56	0.46	0.84	0.65	1.12	1.02	07.62
	>24	0.00	0.00	0.46	0.46	0.00	0.00	0.56	1.12	0.46	0.46	0.65	1.67	3.44	2.42	0.09	0.28	12.08
	TOTALS	2.32	2.23	1.58	2.04	0.93	0.09	0.93	3.90	3.72	1.02	2.60	4.46	6.51	5.76	3.72	5.30	47.49
	CALM																	00.56
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	00.09
	4-7	0.09	0.56	0.00	0.00	0.00	0.19	0.00	0.00	0.09	0.28	0.37	0.65	0.93	0.37	0.37	0.28	04.18
E	8-12	0.19	0.19	0.09	0.00	0.00	0.00	0.19	0.00	0.19	0.28	0.84	0.37	0.93	0.65	0.84	0.56	05.30
	13-18	0.00	0.09	0.37	0.00	0.00	0.00	0.37	0.46	0.28	0.37	0.65	1.39	1.12	0.84	0.74	0.19	06.88
	19-24	0.00	0.00	0.00	0.09	0.19	0.00	0.09	0.09	0.46	0.46	1.21	1.21	0.56	0.84	0.65	0.09	05.95
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.93	0.65	0.74	0.56	1.02	0.37	0.37	0.37	0.00	05.11
	TOTALS	0.28	0.84	0.46	0.09	0.19	0.19	0.74	1.49	1.67	2.14	3.62	4.74	3.90	3.07	2.97	1.12	28.07

TABLE 2.3-21 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	00.37
F	8-12	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.46	0.09	0.09	0.37	0.37	0.46	02.60
	13-18	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.28	0.19	0.00	0.93	0.84	0.93	0.74	04.55
	19-24	0.09	0.00	0.00	0.00	0.00	0.00	0.28	0.09	0.46	0.65	0.37	0.09	0.37	1.30	0.46	0.09	04.28
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	1.02	1.77	0.56	0.28	0.00	0.00	0.00	03.90
	TOTALS	0.65	0.19	0.00	0.00	0.00	0.00	0.28	0.09	1.12	2.32	2.79	0.74	1.67	2.51	2.04	1.30	15.71
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19	0.19	0.09	0.00	0.19	0.09	01.02
G	8-12	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.19	0.09	0.00	0.09	0.28	0.00	01.12
	13-18	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.19	0.00	0.00	0.00	0.74	0.65	0.74	02.79
	19-24	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.09	0.28	0.19	0.00	0.00	0.00	0.19	0.00	0.00	01.12
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.93	0.00	0.00	0.00	0.00	0.00	01.30
	TOTALS	0.93	0.19	0.00	0.00	0.00	0.00	0.00	0.09	0.37	1.12	1.30	0.28	0.09	1.02	1.12	0.84	07.34

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976-September 30, 1977).

TABLE 2.3-22

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED,
WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT
LEVEL AT LA SALLE COUNTY STATION (MARCH)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	00.09
A	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	13-18	0.00	0.36	0.09	0.09	0.00	0.18	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.54	0.09	0.18	01.62
	19-24	0.00	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	00.36
	>24	0.00	0.00	0.00	0.00	0.09	0.00	0.09	0.09	0.09	0.09	0.18	0.09	0.09	0.00	0.00	0.00	00.81
	TOTALS	0.00	0.36	0.09	0.09	0.18	0.18	0.18	0.27	0.09	0.09	0.18	0.09	0.09	0.72	0.18	0.18	02.98
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
B	8-12	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.27
	13-18	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.27	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.09	00.81
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	00.18
	>24	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.18	0.54	0.27	0.18	0.09	0.09	0.09	0.09	0.00	01.62
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.27	0.36	0.45	0.81	0.27	0.18	0.09	0.09	0.09	0.09	0.18	02.89
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.09	0.18	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.36
C	8-12	0.00	0.63	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	01.08
	13-18	0.00	0.00	0.00	0.09	0.00	0.00	0.27	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	00.63
	19-24	0.00	0.00	0.00	0.00	0.00	0.27	0.18	0.09	0.09	0.18	0.18	0.00	0.09	0.00	0.18	0.09	01.35
	>24	0.00	0.00	0.27	0.00	0.00	0.18	0.09	0.54	0.09	0.45	0.63	0.09	0.36	0.09	0.18	0.00	02.98
	TOTALS	0.00	0.72	0.81	0.09	0.09	0.45	0.54	0.81	0.18	0.63	0.81	0.09	0.45	0.18	0.45	0.09	06.40
	CALM																	00.18
	1-3	0.00	0.27	0.09	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09	0.00	00.63
	4-7	0.27	0.27	0.36	0.18	0.27	0.09	0.09	0.00	0.00	0.27	0.18	0.36	0.45	0.27	0.45	0.45	03.97
D	8-12	1.80	0.36	0.99	0.27	0.45	0.54	0.27	0.00	0.09	0.18	0.00	0.27	0.18	0.18	0.18	0.90	06.67
	13-18	0.45	0.72	1.26	0.81	0.72	1.44	1.35	0.99	0.36	0.27	0.00	0.36	1.17	1.89	1.17	0.90	13.89
	19-24	0.27	0.18	0.90	0.09	0.36	1.17	0.81	0.54	0.72	0.81	0.27	0.18	0.81	1.44	0.99	0.54	10.10
	>24	0.27	0.18	1.44	0.63	0.54	1.44	0.81	0.63	0.36	1.89	0.45	1.35	0.72	1.08	0.81	0.72	13.35
	TOTALS	3.07	1.98	5.05	1.98	2.34	4.69	3.43	2.16	1.62	3.43	0.90	2.52	3.34	4.87	3.70	3.52	48.78
	CALM																	00.27
	1-3	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	00.27
	4-7	0.00	0.00	0.09	0.00	0.00	0.18	0.09	0.18	0.00	0.00	0.18	0.09	0.00	0.00	0.00	0.00	00.81
E	8-12	0.36	0.45	0.45	0.81	0.36	0.27	0.09	0.36	0.27	0.27	0.09	0.18	0.18	0.18	0.18	0.18	04.69
	13-18	0.09	0.36	0.45	0.81	0.36	0.27	0.18	0.09	0.09	0.18	0.09	0.72	0.63	0.72	0.18	0.27	05.50
	19-24	0.36	0.09	0.09	0.09	0.18	0.27	0.36	0.27	0.00	0.18	0.00	0.36	0.45	0.36	0.27	0.27	03.61
	>24	0.09	0.00	0.00	0.00	0.27	0.90	0.72	0.63	1.26	2.07	0.45	0.18	0.09	1.44	0.09	0.18	08.39
	TOTALS	0.90	0.90	1.17	1.71	1.17	1.89	1.44	1.62	1.62	2.80	0.81	1.53	1.35	2.71	0.72	0.90	23.53

TABLE 2.3-22 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.09	00.09
	4-7	0.00	0.09	0.00	0.00	0.00	0.00	0.18	0.09	0.00	0.09	.00	0.00	0.09	0.00	0.00	0.00	00.54
F	8-12	0.00	0.09	0.09	0.00	0.09	0.18	0.09	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.09	00.72
	13-18	0.09	0.09	0.09	0.00	0.27	0.36	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09	01.35
	19-24	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.00	0.09	0.00	0.27	0.18	0.36	0.45	0.27	0.00	02.16
	>24	0.00	0.00	0.00	0.00	0.00	0.09	2.25	0.54	1.44	2.43	0.81	0.45	0.09	0.27	0.09	0.00	08.48
	TOTALS	0.09	0.27	0.18	0.00	0.36	0.90	2.98	0.63	1.53	2.52	1.08	0.72	0.54	0.81	0.45	0.27	13.35
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
G	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.27	0.18	0.18	0.63	0.27	0.00	0.00	0.00	0.00	01.98
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.27	0.18	0.18	0.63	0.27	0.00	0.00	0.00	0.00	02.07

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976-September 30, 1978).

TABLE 2.3-23

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (APRIL)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.07
A	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	00.22
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.14	0.00	0.07	0.00	0.00	0.00	0.00	00.29
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	00.22
	>24	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.50	0.14	0.07	0.00	0.00	0.00	01.01
	TOTALS	0.00	0.00	0.00	0.00	0.29	0.07	0.14	0.07	0.14	0.29	0.50	0.22	0.07	0.00	0.00	0.00	01.79
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	00.07
B	8-12	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.22
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.14	0.00	0.00	00.22
	>24	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.14	0.36	0.43	0.43	0.14	0.07	0.07	01.72
	TOTALS	0.07	0.07	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.14	0.43	0.50	0.43	0.29	0.07	0.07	02.23
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	00.14
C	8-12	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.14	0.07	0.00	0.00	0.00	0.00	00.43
	13-18	0.00	0.50	0.22	0.14	0.07	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.14	0.00	0.00	01.22
	19-24	0.00	0.29	0.00	0.07	0.07	0.00	0.22	0.22	0.07	0.00	0.22	0.14	0.07	0.14	0.00	0.00	01.51
	>24	0.00	0.07	0.00	0.00	0.22	0.00	0.00	0.07	0.00	0.07	0.29	0.50	0.43	0.36	0.07	0.36	02.44
	TOTALS	0.00	0.93	0.36	0.22	0.36	0.00	0.22	0.29	0.14	0.14	0.79	0.72	0.50	0.65	0.07	0.36	05.74
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.07	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	00.22
	4-7	0.22	0.22	0.29	0.36	0.29	0.22	0.43	0.29	0.07	0.14	0.36	0.00	0.00	0.00	0.00	0.00	02.87
D	8-12	0.57	1.01	1.36	0.86	0.36	0.93	1.01	0.22	0.22	0.29	0.57	0.79	0.72	0.50	0.29	0.57	10.27
	13-18	0.79	3.66	1.87	0.65	0.79	0.72	0.79	0.29	1.01	0.50	0.50	0.72	0.50	0.79	0.36	1.01	14.93
	19-24	0.57	1.08	0.79	1.15	0.57	0.43	0.79	0.57	0.57	0.29	0.14	0.43	0.29	1.29	0.93	1.08	10.98
	>24	0.29	0.00	0.14	0.50	1.08	0.72	0.07	0.14	0.86	0.36	0.65	0.79	1.08	1.65	0.57	0.36	09.26
	TOTALS	2.44	5.96	4.45	3.59	3.09	3.02	3.16	1.51	2.73	1.58	2.23	2.73	2.58	4.31	2.15	3.02	48.53
	CALM																	00.14
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	00.07
	4-7	0.07	0.07	0.07	0.07	0.07	0.00	0.22	0.07	0.07	0.14	0.07	0.07	0.00	0.00	0.00	0.07	01.08
E	8-12	0.14	0.43	0.14	0.14	0.14	0.43	0.43	0.22	0.07	0.22	0.22	0.07	0.00	0.07	0.07	0.07	02.87
	13-18	0.36	0.72	0.57	0.86	0.65	0.72	0.22	0.29	0.36	0.14	0.29	0.36	0.36	0.22	0.14	0.22	06.46
	19-24	0.14	0.07	0.29	0.65	0.22	0.57	0.65	0.29	0.65	0.22	0.14	0.50	0.22	0.14	0.07	0.14	04.95
	>24	0.14	0.07	0.07	0.50	1.08	0.65	0.36	0.22	0.79	0.65	0.43	0.36	1.22	0.22	0.00	0.00	06.75
	TOTALS	0.86	1.36	1.15	2.23	2.15	2.37	1.87	1.08	1.94	1.44	1.15	1.36	1.79	0.65	0.29	0.50	22.33

TABLE 2.3-23 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.07
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	00.22
	4-7	0.00	0.07	0.14	0.00	0.07	0.07	0.14	0.14	0.00	0.14	0.00	0.14	0.00	0.00	0.00	0.00	00.93
F	8-12	0.14	0.07	0.00	0.00	0.22	0.14	0.07	0.07	0.22	0.14	0.07	0.00	0.00	0.00	0.00	0.00	01.15
	13-18	0.07	0.00	0.00	0.14	0.36	0.36	0.22	0.43	0.36	0.29	0.22	0.00	0.00	0.07	0.22	0.14	02.87
	19-24	0.00	0.00	0.00	0.00	0.29	0.22	0.65	0.22	0.22	0.29	0.29	0.07	0.22	0.57	0.29	0.00	03.30
	>24	0.00	0.00	0.00	0.00	0.00	0.22	0.29	0.50	0.50	2.01	0.72	0.22	0.00	0.07	0.07	0.00	04.59
	TOTALS	0.22	0.14	0.14	0.14	0.93	1.01	1.44	1.36	1.29	3.02	1.29	0.43	0.22	0.72	0.57	0.14	13.14
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00	00.29
G	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.07	0.00	0.00	0.00	0.00	00.22
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.43	0.50	0.07	0.14	0.07	0.36	0.07	0.07	0.00	02.08
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.36	0.93	1.29	0.50	0.07	0.14	0.14	0.00	03.66
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.65	0.93	1.15	1.65	0.65	0.43	0.22	0.22	0.00	06.25

Note: Stability based on 33- and 375-foot ΔT for the period of record (October 1, 1976 - September 30, 1978).

TABLE 2.3-24

MONTHLY THREE-WAY JOINT FREQU[illegible] DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (MAY)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
A	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.15
	4-7	0.00	0.00	0.08	0.08	0.46	0.23	0.30	0.08	0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.00	01.44
	8-12	0.00	0.00	0.00	0.30	0.53	0.38	0.08	1.29	0.46	0.38	0.00	0.00	0.00	0.00	0.00	0.00	03.42
	13-18	0.00	0.00	0.00	0.08	0.00	0.38	0.08	0.38	0.46	0.30	0.08	0.00	0.15	0.00	0.00	0.00	01.90
	19-24	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.08	0.08	0.08	0.46	0.38	0.00	0.00	0.00	01.14
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.46	0.00	0.00	0.38	0.30	0.08	0.00	01.37
	TOTALS	0.00	0.00	0.08	0.46	1.06	1.14	0.46	1.82	1.14	1.37	0.15	0.46	0.91	0.30	0.08	0.00	09.42
B	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	00.08
	8-12	0.00	0.08	0.23	0.38	0.00	0.15	0.15	0.08	0.00	0.15	0.08	0.00	0.00	0.00	0.00	0.00	01.29
	13-18	0.00	0.00	0.30	0.30	0.00	0.00	0.00	0.15	0.00	0.15	0.15	0.15	0.08	0.00	0.00	0.00	01.29
	19-24	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.15	0.08	0.00	0.00	0.00	0.00	00.61
	>24	0.00	0.00	0.08	0.00	0.61	0.15	0.15	0.15	0.08	0.00	0.15	0.00	0.08	0.00	0.08	0.00	01.52
	TOTALS	0.00	0.15	0.68	0.68	0.51	0.30	0.30	0.61	0.08	0.30	0.53	0.23	0.15	0.08	0.08	0.00	04.78
C	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.08	0.00	0.08	0.08	0.08	0.15	0.08	0.00	0.00	0.08	0.08	0.15	0.00	0.00	0.00	0.00	00.84
	8-12	0.00	0.00	0.61	0.61	0.53	0.00	0.00	0.08	0.08	0.23	0.08	0.00	0.08	0.08	0.00	0.00	02.35
	13-18	0.00	0.00	0.38	0.38	0.08	0.08	0.00	0.00	0.15	0.15	0.15	0.46	0.08	0.00	0.00	0.00	01.90
	19-24	0.00	0.00	0.15	0.08	0.00	0.00	0.08	0.08	0.08	0.38	0.08	0.08	0.00	0.00	0.00	0.08	01.06
	>24	0.00	0.00	0.15	0.00	0.38	0.00	0.00	0.00	0.08	0.15	0.00	0.00	0.15	0.00	0.00	0.00	00.91
	TOTALS	0.08	0.00	1.37	1.14	1.06	0.23	0.15	0.15	0.38	0.99	0.38	0.68	0.30	0.08	0.00	0.00	07.06
D	CALM																	00.30
	1-3	0.00	0.00	0.00	0.08	0.08	0.00	0.08	0.00	0.00	0.06	0.00	0.00	0.15	0.08	0.00	0.00	00.46
	4-7	0.30	0.15	0.6	0.23	0.30	0.08	0.23	0.15	0.30	0.61	0.46	0.30	0.15	0.30	0.15	0.23	04.56
	8-12	0.[illegible]5	1.44	0	0.76	0.38	0.84	0.30	0.30	0.46	0.53	0.38	0.68	0.68	0.68	0.23	0.15	09.57
	13-18	0.30	1.59	3.04	1.67	0.84	0.53	0.76	0.08	0.38	1.06	0.68	0.91	1.75	0.23	0.15	0.08	14.05
	19-24	0.00	0.15	1.14	0.84	0.38	0.38	0.30	0.08	0.76	1.06	0.30	0.38	0.23	0.00	0.08	0.00	06.07
	>24	0.00	0.00	0.76	0.53	0.15	0.23	0.15	0.15	0.91	0.46	0.76	0.30	0.84	0.30	0.08	0.00	05.62
	TOTALS	1.37	3.34	6.53	4.10	2.13	2.05	1.82	0.76	2.81	3.72	2.58	2.58	3.80	1.59	0.68	0.46	40.62
E	CALM																	00.08
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	00.08
	4-7	0.00	0.23	0.15	0.00	0.00	0.15	0.08	0.23	0.08	0.15	0.08	0.15	0.08	0.38	0.00	0.00	01.44
	8-12	0.15	0.23	0.53	0.14	0.23	0.00	0.30	0.00	0.23	0.23	0.38	0.30	0.08	0.00	0.08	0.00	02.89
	13-18	0.15	0.23	0.46	0.84	0.76	0.61	0.61	0.15	0.30	0.46	0.53	0.30	0.30	0.08	0.00	0.00	05.77
	19-24	0.08	0.08	0.00	0.91	0.61	0.23	0.23	0.15	0.99	0.30	0.46	0.38	0.15	0.08	0.30	0.00	04.94
	>24	0.23	0.00	0.00	0.38	0.08	0.00	0.23	0.84	1.37	0.38	0.38	0.46	0.23	0.00	0.00	0.00	04.56
	TOTALS	0.51	0.76	1.14	2.28	1.67	0.99	1.44	1.37	2.96	1.52	1.82	1.59	0.84	0.30	0.38	0.00	19.74

TABLE 2.3-24 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.08	0.15	0.00	0.00	0.00	0.08	0.00	0.15	0.00	0.00	0.00	0.00	00.46
F	8-12	0.00	0.00	0.00	0.23	0.38	0.23	0.15	0.08	0.38	0.30	0.30	0.00	0.23	0.23	0.00	0.00	02.51
	13-18	0.23	0.00	0.08	0.15	0.30	0.23	0.08	0.08	0.15	0.15	0.46	0.61	0.53	0.23	0.08	0.00	03.34
	19-24	0.08	0.00	0.00	0.30	0.08	0.23	0.38	0.08	0.38	0.68	0.99	0.91	0.76	0.30	0.00	0.00	05.16
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.84	1.14	0.38	0.68	0.30	0.15	0.00	0.00	0.00	03.57
	TOTALS	0.30	0.00	0.08	0.68	0.84	0.84	0.68	1.06	2.13	1.52	2.58	1.82	1.67	0.76	0.08	0.00	15.03
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	00.30
G	8-12	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.08	0.00	0.38	0.00	0.08	0.00	0.00	0.00	00.61
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.38	0.08	0.00	0.00	0.08	0.00	0.00	0.00	00.61
	19-24	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.23	0.00	0.00	0.00	00.76
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.08	0.00	0.08	0.61	0.00	0.00	0.00	01.06
	TOTALS	0.00	0.00	0.00	0.08	0.08	0.15	0.00	0.08	0.99	0.38	0.38	0.15	1.06	0.00	0.00	0.00	03.34

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976 - September 30, 1978).

TABLE 2.3-25

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (JUNE)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
A	8-12	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
	13-18	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	00.34
	19-24	0.23	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.11	0.00	0.00	00.80
	>24	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.34	1.49	0.00	0.00	0.23	0.11	0.11	0.00	02.40
	TOTALS	0.23	0.34	0.00	0.23	0.00	0.00	0.00	0.00	0.34	1.49	0.00	0.00	0.69	0.23	0.11	0.00	03.66
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
B	8-12	0.00	0.46	0.80	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.11	0.00	0.00	0.00	01.49
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.00	00.80
	19-24	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	1.03	0.34	0.00	0.23	0.00	0.00	0.00	02.17
	>24	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.34	0.34	0.00	0.00	0.23	0.46	0.11	0.00	01.94
	TOTALS	0.80	0.46	0.91	0.11	0.00	0.00	0.00	0.11	0.57	1.49	0.46	0.11	0.69	0.57	0.23	0.00	06.51
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.23
C	8-12	0.11	0.23	0.46	0.00	0.23	0.00	0.23	0.23	0.00	0.00	0.00	0.00	0.11	0.23	0.00	0.00	01.83
	13-18	0.00	0.11	0.00	0.11	0.00	0.00	0.11	0.00	0.23	0.11	0.80	0.11	0.11	0.11	0.23	0.11	02.17
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.46	0.11	0.34	0.11	[illegible]	0.11	0.23	0.00	01.94
	>24	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.11	0.23	0.00	00.57
	TOTALS	0.23	0.46	0.57	0.11	0.23	0.00	0.34	0.46	0.69	0.34	1.14	0.23	0.57	0.57	0.69	0.11	06.74
	CALM																	00.11
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	00.23
	4-7	0.34	0.69	0.57	1.14	0.00	0.34	0.23	0.00	0.23	0.11	0.46	0.23	0.11	0.11	0.23	0.34	05.14
D	8-12	0.69	1.49	0.46	0.69	0.23	0.46	0.91	0.69	1.37	0.34	0.57	0.69	0.46	0.34	0.57	0.57	10.51
	13-18	0.00	0.34	0.57	0.57	0.23	0.34	1.03	1.03	1.37	0.57	0.91	1.03	1.37	1.60	2.06	0.69	13.71
	19-24	0.11	0.00	0.00	0.00	0.57	0.11	0.34	0.46	0.34	0.80	0.57	0.11	0.34	0.46	1.03	0.34	05.60
	>24	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.46	1.37	1.60	0.34	0.34	0.34	0.46	1.60	0.69	07.43
	TOTALS	1.37	2.51	1.60	2.40	1.03	1.26	2.51	2.63	4.69	3.43	3.09	2.40	2.63	2.97	5.49	2.63	42.74
	CALM																	00.11
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.23	0.11	0.00	0.00	00.80
E	8-12	0.23	0.69	0.34	0.57	0.23	0.23	0.23	0.23	0.00	0.11	0.00	0.34	0.23	0.00	0.34	0.00	03.77
	13-18	0.23	0.00	0.11	0.91	0.34	1.49	0.23	0.11	0.57	0.91	0.46	0.11	0.23	0.23	0.34	0.34	06.63
	19-24	0.00	0.11	0.00	0.34	0.69	0.34	0.46	0.91	0.57	0.57	0.69	0.23	0.11	0.57	0.23	0.46	06.29
	>24	0.11	0.00	0.00	0.00	0.00	0.11	0.23	0.57	2.06	1.37	1.03	0.69	0.34	0.11	0.57	0.23	07.43
	TOTALS	0.69	0.80	0.57	1.83	1.26	2.17	1.14	1.83	3.20	3.09	2.29	1.37	1.14	1.03	1.49	1.03	25.03

TABLE 2.3-25 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.23
	1-3	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.23
	4-7	0.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	00.34
F	8-12	0.23	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.23	0.11	0.00	0.11	0.00	0.11	0.46	0.34	01,83
	13-18	0.11	0.00	0.00	0.00	0.11	0.00	0.11	0.11	0.57	0.11	0.00	0.00	0.00	0.23	0.00	0.11	01.49
	19-24	0.00	0.00	0.00	0.11	0.23	0.34	0.80	0.46	0.34	0.11	0.80	0.00	0.46	0.23	0.00	0.00	03.89
	>24	0.00	0.00	0.00	0.00	0.00	0.23	0.57	0.80	0.57	0.91	1.03	0.11	0.34	0.46	0.23	0.00	05.26
	TOTALS	0.34	0.11	0.23	0.23	0.34	0.57	1.60	1.49	1.71	1.26	1.83	0.34	0.80	1.03	0.69	0.46	13.26
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	00.11
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	00.11
G	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.11	0.11	0.11	00.57
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.11	0.23	0.00	00.59
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.11	0.00	0.00	0.00	0.11	0.00	00.46
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.11	0.23	0.00	0.00	0.23	0.57	0.23	02.06

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976 - September 30, 1978).

TABLE 2.3-26

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (JULY)

(Values in Percent of Total Observations)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.00	00.22
	4-7	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.22	0.43	0.00	0.11	0.00	0.00	0.00	0.00	0.00	00.86
A	8-12	0.00	0.00	0.11	0.86	0.11	0.00	0.00	0.11	0.32	0.11	0.22	0.22	0.00	0.00	0.00	0.11	02.16
	13-18	0.32	0.11	0.43	0.00	0.00	0.00	0.00	0.11	0.00	0.11	0.32	0.00	0.00	0.00	0.00	0.00	01.40
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
	TOTALS	0.32	0.11	0.65	0.86	0.11	0.00	0.00	0.43	0.86	0.22	0.65	0.32	0.11	0.00	0.00	0.11	04.75
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.11	0.00	0.00	00.32
B	8-12	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.11	0.11	0.00	0.00	0.00	0.00	00.54
	13-18	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	TOTALS	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.22	0.11	0.00	0.11	0.00	0.00	00.97
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.11
C	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	00.22
	13-18	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	00.22
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.32	0.00	0.00	0.00	0.00	0.00	0.00	00.54
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	00.32
	TOTALS	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.32	0.86	0.11	0.00	0.00	0.00	0.00	0.00	01.40
	CALM																	00.11
	1-3	0.00	0.22	0.00	0.00	0.11	0.00	0.22	0.22	0.00	0.11	0.11	0.22	0.00	0.00	0.00	0.00	01.19
	4-7	1.40	1.08	0.32	0.32	0.22	0.22	0.11	0.54	0.76	0.32	0.76	0.65	0.32	0.11	0.22	0.43	07.78
D	8-12	1.62	1.19	0.43	1.19	0.43	0.32	0.32	0.65	1.30	1.30	0.22	1.73	1.19	0.22	0.76	0.65	13.50
	13-18	0.11	1.30	0.86	0.43	0.32	0.11	0.32	1.19	1.62	1.51	0.86	1.51	1.19	1.19	0.97	0.54	14.04
	19-24	0.22	0.00	0.00	0.00	0.00	0.00	0.22	0.11	1.19	0.65	0.00	0.86	0.65	0.00	0.22	0.22	04.32
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.11	0.54	0.11	0.00	0.32	0.65	0.00	0.00	01.94
	TOTALS	3.35	3.78	1.62	1.94	1.08	0.65	1.19	2.92	4.97	4.43	2.05	4.97	3.67	2.16	2.16	1.84	42.87
	CALM																	00.22
	1-3	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.22	00.43
	4-7	0.00	0.32	0.11	0.32	0.22	0.11	0.32	0.32	0.43	0.43	0.11	0.00	0.22	0.11	0.22	0.00	03.24
E	8-12	0.22	0.32	0.22	0.86	0.32	0.11	0.11	0.32	0.00	0.65	0.11	0.97	0.43	0.11	0.11	0.00	04.86
	13-18	0.00	0.00	0.43	1.19	0.65	0.32	0.22	0.76	0.97	0.97	0.86	0.76	0.43	0.22	0.32	0.43	08.53
	19-24	0.00	0.00	0.00	0.32	0.54	0.11	0.65	0.97	1.40	1.08	1.08	0.86	0.22	0.22	0.22	0.11	07.78
	>24	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.54	1.19	1.30	0.76	0.54	0.00	0.11	0.00	0.00	04.54
	TOTALS	0.22	0.76	0.76	2.70	1.84	0.65	1.30	2.92	4.00	4.54	2.92	3.13	1.30	0.76	0.86	0.76	29.59

TABLE 2.3-26 (Cont'd)

STABILITY CATEGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.22
	1-3	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	00.22
	4-7	0.00	0.00	0.11	0.00	0.22	0.00	0.11	0.22	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.11	00.97
F	8-12	0.00	0.00	0.22	0.22	0.11	0.32	0.11	0.00	0.11	0.43	0.65	0.32	0.00	0.00	0.00	0.00	02.48
	13-18	0.00	0.00	0.00	0.00	0.32	0.11	0.32	0.00	0.97	0.65	0.43	0.11	0.22	0.43	0.00	0.43	04.10
	19-24	0.00	0.00	0.00	0.32	0.32	0.54	0.54	0.11	0.54	1.08	0.22	0.32	0.76	0.00	0.43	0.22	05.40
	>24	0.00	0.00	0.00	0.00	0.11	0.22	0.00	0.00	0.76	0.65	1.08	1.19	0.22	0.00	0.00	0.00	04.21
	TOTALS	0.00	0.00	0.32	0.54	1.08	1.30	1.08	0.43	2.38	2.81	2.38	2.05	1.40	0.43	0.43	0.76	17.60
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	00.32
G	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.11	0.22	00.43
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.22	00.32
	19-24	0.00	0.00	0.00	0.00	0.00	0.11	0.32	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.11	0.22	00.97
	>24	0.00	0.00	0.00	0.00	0.11	0.00	0.32	0.00	0.11	0.11	0.00	0.11	0.00	0.00	0.00	0.00	00.76
	TOTALS	0.11	0.00	0.00	0.00	0.11	0.11	0.65	0.11	0.22	0.22	0.00	0.22	0.22	0.00	0.22	0.65	02.81

Note: Stability is based on 33- and 375-foot ΔT for the period of record (October 1, 1976 - September 30, 1978).

TABLE 2.3-27

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (AUGUST)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
A	CALM																	00.00
	1-3	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.09	0.00	0.00	00.37
	4-7	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	8-12	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	00.18
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.09	0.00	0.00	0.00	0.00	0.00	00.27
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	00.18
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	TOTALS	0.00	0.00	0.18	0.00	0.09	0.00	0.00	0.09	0.18	0.27	0.09	0.00	0.00	0.09	0.09	0.00	01.10
B	CALM																	00.00
	1-3	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	00.18
	4-7	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	00.09
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.27	0.00	0.00	0.00	0.00	0.00	00.46
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	TOTALS	0.09	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.18	0.27	0.00	0.09	0.09	0.00	0.00	00.82
C	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.09	0.00	0.00	0.00	0.00	00.27
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.09	0.00	0.00	0.00	0.00	0.00	00.37
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	00.09
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.27	0.27	0.18	0.00	0.00	0.00	0.00	00.82
D	CALM																	00.46
	1-3	0.18	0.27	0.09	0.18	0.00	0.27	0.27	0.00	0.18	0.00	0.09	0.00	0.09	0.09	0.09	0.27	02.10
	4-7	1.19	0.55	0.55	0.09	0.37	0.91	1.46	1.01	0.64	0.55	0.18	0.37	0.55	0.73	1.01	1.28	11.43
	8-12	0.18	0.73	0.55	0.18	0.27	0.73	2.38	1.37	1.19	1.37	0.64	0.91	1.01	1.65	1.10	0.82	15.08
	13-18	0.18	0.37	0.18	0.09	0.09	0.37	1.10	1.28	1.19	1.83	0.37	0.18	0.27	1.28	1.10	0.82	10.69
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.91	1.01	0.46	0.64	0.18	0.46	0.82	0.18	05.21
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.46	0.46	0.09	0.64	0.00	0.00	0.00	0.09	01.83
	TOTALS	1.74	1.92	1.37	0.55	0.73	2.29	5.21	4.30	4.57	5.21	1.83	2.74	2.10	4.20	4.11	3.47	46.80

TABLE 2.3-27 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.91
	1-3	0.00	0.37	0.27	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.18	0.09	0.09	0.09	0.09	01.28
	4-7	0.27	0.18	0.18	0.27	0.18	0.27	0.37	0.55	0.27	0.46	0.00	0.09	0.27	0.09	0.09	0.00	03.56
	8-12	0.37	0.27	0.37	0.27	0.55	0.64	0.27	0.27	0.09	0.09	0.09	0.27	0.18	0.37	0.37	0.37	04.84
E	13-18	0.18	0.09	0.18	0.18	0.82	0.82	0.82	1.01	0.27	0.27	1.01	0.27	0.18	0.09	0.55	0.64	07.40
	19-24	0.27	0.00	0.00	0.09	0.09	0.18	0.37	1.10	1.10	0.73	0.73	0.18	0.09	0.09	0.09	0.55	05.67
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.46	1.37	0.46	0.27	0.09	0.00	0.00	0.00	0.00	02.83
	TOTALS	1.10	0.91	1.01	0.82	1.65	1.92	2.01	3.38	3.20	2.01	2.10	1.10	0.82	0.73	1.19	1.65	26.51
	CALM																	00.18
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	00.18
	4-7	0.18	0.37	0.27	0.09	0.18	0.46	0.18	0.18	0.18	0.09	0.18	0.00	0.09	0.09	0.18	0.00	02.74
	8-12	0.46	0.18	0.09	0.18	0.00	0.27	0.27	0.64	0.00	0.09	0.27	0.18	0.27	0.27	0.27	0.64	04.11
F	13-18	0.27	0.09	0.00	0.00	0.27	0.46	0.64	1.10	0.27	0.00	1.10	0.37	0.09	0.55	0.27	0.18	05.67
	19-24	0.09	0.00	0.00	0.00	0.00	0.18	0.55	0.73	0.46	0.37	0.46	0.27	0.00	0.00	0.00	0.27	03.29
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.37	0.46	0.00	0.27	0.18	0.00	0.00	0.00	0.00	01.65
	TOTALS	1.01	0.64	0.37	0.27	0.46	1.37	2.01	3.11	1.37	0.55	2.29	1.01	0.46	0.91	0.73	1.10	17.82
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.27
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.18
	8-12	0.00	0.00	0.00	0.00	0.09	0.00	0.27	0.09	0.37	0.00	0.00	0.00	0.00	0.00	0.09	0.00	00.91
G	13-18	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.46	0.09	0.00	0.09	0.00	0.09	0.09	0.09	0.00	01.01
	19-24	0.00	0.00	0.00	0.00	0.00	0.18	0.27	0.46	0.55	0.00	0.18	0.27	0.00	0.00	0.00	0.00	01.92
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.27	0.55	0.46	0.27	0.00	0.00	0.00	0.00	01.83
	TOTALS	0.00	0.00	0.00	0.00	0.18	0.18	0.64	1.65	1.28	0.55	0.73	0.55	0.09	0.09	0.18	0.00	06.12

NOTE: Stability is based on 33- and 375-foot ΔT for the period of record October 1, 1976 - September 30, 1978

TABLE 2.3-28

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (SEPTEMBER)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.13	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.13	0.00	0.00	0.00	0.13	0.13	01.00
	8-12	0.00	0.00	0.00	0.13	0.13	0.13	0.25	0.00	0.63	0.13	0.13	0.00	0.00	0.00	0.00	0.13	01.63
A	13-18	0.00	0.00	0.00	0.75	0.25	0.00	0.00	0.00	0.00	0.25	0.38	0.00	0.13	0.00	0.13	0.00	01.88
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.13	0.25	0.00	0.00	0.13	0.00	0.00	0.00	01.25
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.25	0.38	0.00	0.00	0.00	01.38
	TOTALS	0.13	0.00	0.00	0.88	0.38	0.38	0.25	0.75	1.00	0.88	1.13	0.25	0.63	0.00	0.25	0.25	07.13
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.13	00.38
	8-12	0.00	0.00	0.00	0.00	0.13	0.13	0.63	0.13	0.13	0.38	0.13	0.13	0.00	0.00	0.00	0.38	02.13
B	13-18	0.00	0.00	0.00	0.13	0.13	0.13	0.00	0.25	0.25	0.00	0.50	0.00	0.00	0.00	0.50	0.25	02.13
	19-24	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.13	0.13	0.25	0.00	00.88
	>24	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.13
	TOTALS	0.00	0.00	0.00	0.38	0.38	0.25	0.63	0.38	0.50	0.38	0.88	0.13	0.13	0.13	0.75	0.75	05.63
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	00.13
	4-7	0.13	0.00	0.13	0.00	0.00	0.13	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.50
	8-12	0.00	0.00	0.00	0.00	0.00	0.13	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	00.63
C	13-18	0.00	0.00	0.00	0.25	0.13	0.00	0.13	0.0	0.13	0.00	0.38	0.13	0.13	0.00	0.38	0.00	01.63
	19-24	0.00	0.00	0.00	0.25	0.25	0.00	0.00	0.[illegible]	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.63
	>24	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.13
	TOTALS	0.13	0.00	0.13	0.63	0.38	0.25	0.38	0.00	0.38	0.00	0.50	0.13	0.13	0.00	0.50	0.13	03.63
	Calm																	00.13
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.13	0.00	0.00	0.00	0.00	00.38
	4-7	0.00	0.38	0.75	0.25	0.50	0.13	0.63	0.25	0.00	0.63	0.50	0.25	0.75	0.25	0.00	0.00	05.26
	8-12	0.00	0.25	1.50	0.50	0.25	0.13	0.00	0.38	0.63	2.00	0.88	0.25	0.75	0.13	0.13	0.00	07.76
D	13-18	0.13	0.13	0.88	0.75	0.13	0.13	0.38	1.00	2.63	2.25	0.75	0.63	1.25	0.50	0.75	0.50	12.77
	19-24	0.00	0.00	0.00	0.75	0.75	1.13	0.38	0.50	1.38	1.00	0.50	0.25	1.38	0.50	0.00	0.13	08.64
	>24	0.13	0.00	0.00	0.13	0.00	0.00	0.00	0.13	0.13	0.50	0.25	0.00	0.38	0.00	0.00	0.00	01.63
	TOTALS	0.25	0.75	3.13	2.38	1.63	1.50	1.38	2.25	4.76	6.38	3.13	1.50	4.51	1.38	0.88	0.63	36.55

TABLE 2.3-28 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNW	NE	ENE	E	ESE	SE	SSE	S	SSW	WS	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.00
	1-3	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.38
	4-7	0.38	0.25	0.00	0.13	0.38	0.50	0.63	0.25	0.13	0.13	0.13	0.00	0.13	0.00	0.00	0.00	03.00
	8-12	0.00	0.13	0.00	0.38	0.38	0.13	0.00	0.38	0.50	0.00	0.13	0.13	0.00	0.25	0.13	0.13	02.63
E	13-18	0.00	0.75	0.25	0.38	0.00	0.13	0.13	0.75	0.88	1.13	0.00	0.25	0.13	0.00	0.25	0.00	05.01
	19-24	0.13	0.00	0.00	0.63	0.00	0.25	0.13	1.25	1.38	1.00	0.75	0.00	0.38	0.50	0.75	0.38	07.51
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.38	0.00	0.00	0.13	0.38	0.00	0.00	01.38
	TOTALS	0.50	1.38	0.25	1.50	0.75	1.00	0.88	2.63	3.50	2.63	1.00	0.38	0.75	1.13	1.13	0.50	19.90
	Calm																	00.13
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.13
	4-7	0.00	0.00	0.00	0.00	0.13	0.13	0.25	0.00	0.13	0.00	0.00	0.00	0.13	0.00	0.00	0.00	00.75
	8-12	0.00	0.38	0.00	0.00	0.25	0.88	0.38	0.50	0.75	0.38	0.13	0.13	0.13	0.00	0.00	0.00	03.88
F	13-18	0.13	0.25	0.00	0.13	0.50	0.13	0.00	0.25	0.00	0.38	0.00	0.13	0.13	0.00	0.00	0.13	02.13
	19-24	0.00	0.00	0.00	0.25	0.75	0.25	0.13	0.75	0.50	1.38	1.38	0.38	0.50	0.13	0.75	0.38	07.51
	>24	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.13	1.13	0.50	0.25	0.38	0.13	0.00	0.00	03.25
	TOTALS	0.50	0.63	0.00	0.38	1.63	1.38	0.75	1.88	1.63	3.25	2.00	0.88	1.25	0.25	0.75	0.50	17.77
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.25	0.50	0.13	0.00	0.00	0.00	01.13
G	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.50	1.13	0.38	0.13	0.00	02.25
	19-24	0.13	0.00	0.00	0.00	0.25	0.25	0.25	0.25	0.13	0.63	1.00	0.38	0.75	0.13	0.00	0.00	04.13
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.38	0.00	0.25	0.75	0.13	0.13	0.00	0.00	0.00	01.88
	TOTALS	0.13	0.00	0.00	0.00	0.25	0.25	0.50	0.88	0.25	0.88	2.50	2.13	1.38	0.25	0.00	0.00	09.39

NOTE: Stability is based on 33- and 375-foot ΔT for the period of record October 1, 1976 - September 30, 1978

TABLE 2.3-29

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (OCTOBER)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.00
	1-3	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	8-12	0.09	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.44
A	13-18	0.00	0.00	0.00	0.35	0.26	0.00	0.00	0.00	0.79	0.88	0.00	0.00	0.00	0.09	0.09	0.00	02.47
	19-24	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.09	0.00	0.09	00.44
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.18	0.09	0.00	0.26	0.00	0.00	0.00	0.00	00.79
	TOTALS	0.18	0.00	0.00	0.62	0.26	0.00	0.00	0.26	1.32	0.97	0.00	0.26	0.00	0.18	0.09	0.09	04.23
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.09	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.09	0.35	0.09	0.00	0.09	0.35	0.09	0.18	01.50
	8-12	0.09	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.09	0.35	0.35	0.18	01.76
B	13-18	0.09	0.26	0.00	0.35	0.09	0.00	0.00	0.00	0.18	0.00	0.00	0.18	0.18	0.62	0.26	0.18	02.38
	19-24	0.09	0.62	0.09	0.18	0.00	0.00	0.00	0.09	0.18	0.00	0.00	0.09	0.35	0.53	0.09	0.44	02.73
	>24	0.00	0.18	0.00	0.09	0.00	0.00	0.00	0.00	0.26	0.00	0.18	0.79	0.26	0.00	0.00	0.00	01.76
	TOTALS	0.35	1.06	0.09	0.79	0.26	0.00	0.00	0.09	1.23	0.35	0.26	1.06	0.97	1.85	0.79	0.97	10.13
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	4-7	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09	0.00	0.00	0.09	00.53
	8-12	0.00	0.18	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.09	0.26	0.18	01.15
C	13-18	0.09	0.35	0.35	0.18	0.18	0.09	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.18	0.53	0.35	02.38
	19-24	0.09	0.53	0.26	0.44	0.09	0.00	0.00	0.44	0.09	0.00	0.09	0.18	0.09	0.09	0.00	0.09	02.47
	>24	0.00	0.00	0.00	0.00	0.00	0.09	0.35	0.00	0.09	0.00	0.00	0.26	0.09	0.44	0.00	0.00	01.32
	TOTALS	0.18	1.06	0.70	0.62	0.35	0.26	0.35	0.44	0.26	0.09	0.18	0.70	0.44	0.79	0.79	0.70	07.93
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.09	0.00	0.00	00.18
	4-7	0.75	0.35	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.35	0.26	0.09	0.09	0.09	0.26	0.44	03.00
	8-12	0.79	0.70	0.44	0.35	0.44	0.44	0.09	0.18	0.09	0.35	0.44	0.44	0.09	0.53	0.35	0.26	05.99
D	13-18	1.94	0.26	0.44	0.53	0.44	0.62	0.88	0.53	0.44	0.35	0.26	0.18	0.09	0.44	0.44	3.17	11.01
	19-24	1.06	0.35	0.35	0.88	0.00	0.26	0.00	1.85	0.88	1.23	0.62	0.62	1.50	0.35	0.26	2.64	12.86
	>24	0.26	0.00	0.00	0.18	0.00	0.18	0.00	0.53	0.53	0.09	0.09	0.44	0.97	0.53	0.00	0.09	03.88
	TOTALS	4.85	1.67	1.32	1.94	0.88	1.50	0.97	3.17	2.03	2.38	1.76	1.76	2.73	2.03	1.32	6.61	36.92

TABLE 2.3-29 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.00
	1-3	0.00	0.09	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	00.26
	4-7	0.35	0.18	0.09	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.26	0.00	0.18	0.00	0.26	0.18	01.94
	8-12	0.18	0.00	0.09	0.00	0.18	0.18	0.00	0.00	0.18	0.53	0.09	0.00	0.09	0.00	0.44	0.35	02.29
E	13-18	0.35	0.44	0.18	0.09	0.70	0.26	0.00	0.09	0.44	0.00	0.35	0.09	0.00	0.18	0.09	0.53	03.79
	19-24	0.88	0.18	0.09	0.62	1.67	0.26	0.00	0.53	0.26	0.88	0.44	0.00	0.26	0.35	1.15	0.44	08.02
	>24	0.00	0.00	0.00	0.09	0.18	0.09	0.70	0.44	0.44	0.79	0.26	0.44	0.26	0.70	0.09	0.00	04.49
	TOTALS	1.76	0.88	0.44	0.79	2.82	0.79	0.70	1.06	1.76	2.20	1.41	0.53	0.79	1.23	2.03	1.59	20.79
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.09
	4-7	0.00	0.00	0.26	0.00	0.00	0.09	0.18	0.09	0.09	0.00	0.09	0.09	0.26	0.09	0.18	0.09	01.50
	8-12	0.18	0.09	0.00	0.00	0.18	0.26	0.00	0.09	0.35	0.26	0.35	0.09	0.09	0.18	0.18	0.18	02.47
F	13-18	0.18	0.00	0.00	0.00	0.44	0.18	0.09	0.00	0.26	0.35	0.70	0.26	0.00	0.00	0.26	0.44	03.17
	19-24	0.00	0.00	0.00	0.00	0.26	0.09	0.09	0.00	0.44	0.26	0.62	0.18	0.00	0.09	0.79	0.35	03.17
	<24	0.00	0.00	0.00	0.00	0.18	0.35	0.18	0.18	0.88	0.44	0.97	0.09	0.35	0.09	0.09	0.09	03.88
	TOTALS	0.35	0.09	0.26	0.00	1.06	0.97	0.53	0.44	2.03	1.32	2.73	0.70	0.70	0.44	1.50	1.15	14.27
	Calm																	00.09
	1-3	0.00	0.00	0.00	0.00	[illegible]	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.09	00.35
	4-7	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.35	0.18	0.18	0.09	0.09	01.06
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.18	0.26	0.18	0.00	0.00	0.00	00.79
G	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.35	0.18	0.00	0.00	0.00	0.00	01.06
	19-24	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.53	0.18	0.09	0.00	0.09	0.00	0.00	01.23
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.26	0.09	0.00	0.00	0.00	0.00	0.00	01.15
	TOTALS	0.35	0.00	0.00	0.00	0.00	0.00	0.09	0.00	1.41	1.06	0.79	0.97	0.44	0.26	0.09	0.18	05.73

NOTE: Stability is based on 33- and 375-foot ΔT for the period or record October 1, 1976 - September 30, 1978.

TABLE 2.3-30

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (NOVEMBER)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	00.15
A	13-18	0.00	0.07	0.37	0.00	0.00	0.00	0.00	0.07	0.15	0.07	0.00	0.07	0.07	0.00	0.00	0.00	00.97
	19-24	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.22	0.07	0.07	0.37	0.15	0.15	0.07	0.00	01.20
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.45	0.00	0.07	0.00	0.00	00.67
	TOTALS	0.00	0.07	0.45	0.00	0.00	0.00	0.00	0.07	0.45	0.22	0.22	0.90	0.22	0.22	0.15	0.00	03.00
	Calm																	00.00
	1-3	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.15
	4-7	0.30	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.52
	8-12	0.37	0.22	0.37	0.00	0.07	0.00	0.00	0.07	0.22	0.00	0.07	0.00	0.30	0.15	0.00	0.00	01.87
B	13-18	0.07	0.15	0.60	0.00	0.07	0.00	0.00	0.30	0.00	0.07	0.00	0.00	0.07	0.07	0.00	0.00	01.42
	19-24	0.07	0.07	0.07	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07	0.22	0.52	0.07	0.00	01.20
	>24	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07	0.00	0.30	0.52	0.15	0.15	0.00	0.00	01.27
	TOTALS	0.90	0.75	1.05	0.00	0.22	0.00	0.00	0.45	0.30	0.07	0.37	0.60	0.75	[illegible]	0.07	0.00	06.44
	Calm																	00.07
	1-3	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.07	0.00	00.30
	4-7	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.07	0.07	0.15	0.07	0.00	0.07	0.00	00.60
	8-12	0.22	0.52	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.07	0.00	0.15	0.07	0.00	0.00	0.00	01.27
C	13-18	0.22	0.22	0.22	0.00	0.22	0.00	0.22	0.09	0.07	0.00	0.07	0.00	0.15	0.37	0.15	0.00	01.95
	19-24	0.07	0.07	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.00	0.07	0.30	0.07	0.00	0.00	00.75
	>24	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.07	0.00	0.75	0.22	0.45	0.00	0.07	0.00	01.72
	TOTALS	0.60	0.82	0.22	0.00	0.30	0.15	0.30	0.30	0.22	0.15	0.90	0.60	1.20	0.45	0.37	0.00	06.67
	Calm																	00.07
	1-3	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	00.30
	4-7	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.22	0.22	0.22	0.22	0.00	0.00	0.00	01.27
	8-12	0.30	0.22	0.37	0.52	0.00	0.00	0.15	0.22	0.67	0.15	0.45	0.60	1.12	0.60	0.22	0.07	05.69
D	13-18	0.22	0.30	1.65	0.15	0.15	0.15	0.15	0.45	0.45	0.60	0.52	0.52	2.55	2.40	1.95	0.45	12.66
	19-24	0.07	0.22	0.15	0.15	0.30	0.60	0.67	1.35	0.22	0.37	0.60	0.97	1.57	5.17	2.32	0.45	15.21
	>24	0.07	0.00	0.00	0.00	0.07	0.22	0.37	0.37	1.27	0.52	0.60	0.90	2.40	2.85	0.60	0.22	10.49
	TOTALS	0.82	0.82	2.25	0.82	0.52	0.97	1.35	2.62	2.62	1.87	2.40	3.22	8.01	11.01	5.09	1.20	45.69

TABLE 2.3-30 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.07
	1-3	0.00	0.00	0.07	0.07	0.07	0.00	0.22	0.07	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	00.60
	4-7	0.00	0.00	0.07	0.37	0.00	0.00	0.15	0.00	0.15	0.00	0.00	0.15	0.15	0.15	0.15	0.07	01.42
	8-12	0.07	0.07	0.07	0.00	0.07	0.07	0.30	0.07	0.15	0.07	0.52	0.52	0.15	0.07	0.22	0.00	02.47
E	13-18	0.00	0.00	0.30	0.15	0.22	0.37	0.67	0.37	0.00	0.45	0.07	0.60	0.75	1.42	1.12	0.15	06.67
	19-24	0.00	0.00	0.22	0.00	0.22	0.07	0.37	0.00	0.15	0.07	0.30	0.15	0.75	1.27	1.20	0.07	04.87
	>24	0.00	0.00	0.00	0.00	0.15	0.00	0.07	0.22	1.35	1.20	0.52	0.15	0.37	1.65	0.30	0.00	05.99
	TOTALS	0.07	0.07	0.75	0.60	0.75	0.52	1.80	0.75	1.80	1.80	1.42	1.65	2.17	4.57	3.00	0.30	22.10
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.15
	4-7	0.00	0.00	0.07	0.00	0.00	0.07	0.15	0.00	0.15	0.00	0.00	0.00	0.07	0.07	0.00	0.00	00.60
	8-12	0.00	0.00	0.07	0.30	0.00	0.07	0.0	0.00	0.00	0.00	0.00	0.15	0.30	0.60	0.15	0.07	01.80
F	13-18	0.07	0.00	0.00	0.00	0.37	0.15	0.15	0.22	0.22	0.15	0.45	0.07	0.22	0.90	1.42	0.67	05.09
	19-24	0.00	0.00	0.00	0.00	0.30	0.30	0.00	0.15	0.22	0.22	0.22	0.15	0.82	0.22	0.37	0.00	03.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.45	0.52	0.75	0.45	1.05	0.90	0.00	0.00	04.19
	TOTALS	0.07	0.00	0.15	0.30	0.75	0.60	0.45	0.45	1.05	0.90	1.42	0.82	2.47	2.70	1.95	0.75	14.83
	Calm																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.0C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	00.07
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	00.15
G	13-18	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.07	0.22	0.30	0.00	0.07	0.00	0.00	00.67
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	00.15
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.07	0.00	0.00	0.00	00.22
	TOTALS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.30	0.37	0.30	0.07	0.15	0.00	0.00	01.27

NOTE: Stability is based on 33- and 375-foot ΔT for the period of record October 1, 1976 - September 30, 1978

TABLE 2.3-31

MONTHLY THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT LA SALLE COUNTY STATION (DECEMBER)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
A	CALM																	00.15
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	00.08
	4-7	0.00	0.00	0.00	0.00	0.08	0.15	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.30
	8-12	0.00	0.00	0.08	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.00	0.15	0.00	0.00	0.00	00.45
	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.53	0.76	0.00	0.00	0.00	01.44
	19-24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.60	0.00	0.00	0.00	00.83
	>24	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.23	0.00	0.00	0.00	0.23	0.15	0.00	0.15	0.00	00.83
	TOTALS	0.08	0.00	0.08	0.08	0.08	0.30	0.23	0.23	0.00	0.00	0.15	0.91	1.66	0.00	0.15	0.00	04.08
B	CALM																	00.08
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	00.08
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	00.08
	8-12	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.23
	13-18	0.30	0.08	0.08	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.08	0.15	0.08	0.00	0.00	0.00	00.98
	19-24	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	00.38
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.08	0.00	0.38	0.00	0.00	00.60
	TOTALS	0.30	0.08	0.30	0.08	0.08	0.23	0.15	0.00	0.00	0.00	0.23	0.23	0.15	0.38	0.08	0.08	02.42
C	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.08
	8-12	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.00	0.00	0.00	0.08	00.30
	13-18	0.00	0.00	0.00	0.00	0.15	0.08	0.15	0.00	0.00	0.00	0.08	0.76	0.23	0.23	0.00	0.00	01.66
	19-24	0.53	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.15	0.30	0.15	0.23	0.00	0.00	0.00	01.44
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.08	0.15	0.23	1.21	0.00	0.00	01.81
	TOTALS	0.60	0.00	0.00	0.00	0.15	0.08	0.38	0.00	0.08	0.23	0.45	1.13	0.68	1.44	0.00	0.08	5.29
D	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	00.15
	4-7	0.00	0.08	0.00	0.08	0.00	0.00	0.08	0.15	0.08	0.00	0.08	0.45	0.23	0.00	0.23	0.08	01.51
	8-12	0.68	0.08	0.30	0.23	0.53	0.38	0.60	0.53	0.15	0.08	0.68	1.13	1.13	0.53	0.76	0.60	08.38
	13-18	0.53	0.08	0.08	0.33	0.68	0.68	1.44	0.08	0.38	0.30	0.45	1.28	2.04	1.59	0.83	1.51	12.31
	19-24	0.53	0.00	0.45	0.38	0.08	0.15	0.08	0.53	0.68	0.45	0.83	1.21	1.96	2.57	2.27	1.21	13.37
	>24	0.00	0.00	0.15	0.00	0.00	0.00	1.13	0.68	3.70	0.76	0.76	1.36	3.10	2.64	2.04	0.23	16.54
	TOTALS	1.74	0.23	0.98	1.06	1.36	1.21	3.32	1.96	4.98	1.66	2.79	5.44	8.46	7.33	6.12	3.63	52.27

TABLE 2.3-31 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNW	NW	ENE	E	SES	SE	SSF	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	CALM																	00.15
	1-3	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.08	0.00	0.00	0.15	0.00	0.00	00.38
	4-7	0.08	0.08	0.00	0.00	0.00	0.00	0.15	0.00	0.08	0.15	0.08	0.08	0.38	0.00	0.23	0.00	01.28
	8-12	0.15	0.38	0.23	0.08	0.00	0.00	0.00	0.38	0.15	0.15	0.53	0.60	0.53	0.08	0.45	0.38	04.08
E	13-18	0.68	0.08	0.15	0.15	0.15	0.00	0.08	0.00	0.15	0.45	0.76	1.28	0.83	0.38	0.15	0.76	06.04
	19-24	0.45	0.00	0.00	0.08	0.23	0.00	0.15	0.15	0.53	0.38	0.53	0.60	0.53	0.53	0.53	0.23	05.21
	>24	0.00	0.00	0.00	0.00	0.08	0.15	0.38	0.45	2.04	2.72	0.53	0.60	0.68	1.36	0.08	0.00	09.06
	TOTALS	1.44	0.53	0.38	0.30	0.45	0.15	0.83	0.98	2.95	3.85	2.49	3.17	2.95	2.79	1.44	1.36	26.21
	CALM																	0.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4-7	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.23	0.15	0.00	0.00	0.00	00.53
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.30	0.23	0.00	0.00	0.08	0.08	00.83
F	13-18	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.38	0.30	0.15	0.23	0.30	0.23	0.00	02.11
	19-24	0.08	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.23	0.15	0.15	0.23	0.60	0.38	0.15	0.00	02.34
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.53	0.53	0.53	0.30	0.08	0.30	0.00	0.00	02.34
	TOTALS	0.30	0.15	0.00	0.00	0.00	0.00	0.38	0.08	1.06	1.21	1.28	1.13	1.06	0.98	0.45	0.08	08.16
	CALM																	00.00
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	4-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	00.08
	8-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	00.08
G	13-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	00.08
	19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	00.00
	>24	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.15	0.15	0.30	0.60	00.00	0.08	0.00	0.00	0.00	01.36
	TOTALS	00.00	0.00	0.00	0.00	0.00	0.00	0.08	0.15	0.15	0.30	0.60	0.00	0.15	0.08	0.00	0.08	01.59

NOTE: Stability is based on 33- and 375-foot ΔT for the period of record October 1, 1976 - September 30, 1978.

TABLE 2.3-32

THREE-WAY JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION,

AND PASQUILL STABILITY CLASS FOR THE 375-FOOT LEVEL AT

LA SALLE STATION (OCTOBER 1, 1976 - SEPTEMBER 30, 1978)

(Values in Percent of Total Observations)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.01
	1-3	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00	00.07
	4-7	0.01	0.00	0.02	0.01	0.05	0.06	0.04	0.02	0.05	0.01	0.01	0.00	0.00	0.01	0.01	0.01	00.31
	8-12	0.01	0.01	0.01	0.12	0.07	0.05	0.03	0.14	0.13	0.06	0.04	0.01	0.01	0.00	0.01	0.01	00.72
A	13-18	0.02	0.04	0.07	0.10	0.04	0.05	0.02	0.06	0.13	0.16	0.06	0.07	0.11	0.05	0.03	0.01	01.04
	19-24	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.06	0.04	0.02	0.09	0.14	0.04	0.01	0.01	00.54
	>24	0.00	0.01	0.00	0.00	0.04	0.01	0.01	0.06	0.06	0.18	0.10	0.13	0.10	0.04	0.04	0.00	00.77
	TOTALS	0.07	0.07	0.13	0.24	0.21	0.18	0.11	0.34	0.44	0.46	0.24	0.31	0.38	0.15	0.10	0.04	03.47
	Calm																	00.01
	1-3	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	00.04
	4-7	0.04	0.02	0.01	0.02	0.01	0.00	0.00	0.00	0.01	0.04	0.02	0.01	0.01	0.04	0.01	0.02	00.26
	8-12	0.05	0.07	0.15	0.04	0.03	0.03	0.07	0.02	0.07	0.05	0.03	0.01	0.05	0.04	0.03	0.04	00.79
B	13-18	0.04	0.04	0.10	0.07	0.03	0.02	0.01	0.08	0.05	0.04	0.08	0.05	0.04	0.07	0.06	0.04	00.85
	19-24	0.04	0.07	0.02	0.02	0.00	0.01	0.01	0.04	0.04	0.07	0.05	0.02	0.07	0.12	0.03	0.05	00.67
	>24	0.02	0.01	0.01	0.01	0.07	0.02	0.01	0.04	0.10	0.06	0.13	0.18	0.12	0.13	0.04	0.01	00.96
	TOTALS	0.21	0.22	[illegible]	0.18	0.14	0.09	0.11	0.18	0.27	0.26	0.31	0.27	0.30	0.40	0.17	0.15	03.56
	Calm																	00.01
	1-3	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	00.04
	4-7	0.01	0.01	0.06	0.01	0.01	0.03	0.01	0.01	0.02	0.02	0.03	0.04	0.01	0.00	0.01	0.01	00.30
	8-12	0.04	0.14	0.13	0.06	0.07	0.01	0.03	0.04	0.03	0.05	0.02	0.04	0.04	0.04	0.03	0.03	00.80
C	13-18	0.04	0.12	0.12	0.10	0.07	0.02	0.07	0.01	0.06	0.04	0.14	0.15	0.06	0.10	0.10	0.04	01.23
	19-24	0.07	0.08	0.04	0.07	0.03	0.02	0.06	0.09	0.10	0.13	0.11	0.09	0.12	0.04	0.04	0.02	01.09
	>24	0.01	0.01	0.04	0.01	0.07	0.03	0.05	0.05	0.03	0.09	0.16	0.14	0.19	0.21	0.07	0.04	01.19
	TOTALS	0.17	0.36	0.38	0.24	0.26	0.12	0.22	0.21	0.25	0.32	0.47	0.45	0.43	0.38	0.25	0.13	04.65
	Calm																	00.14
	1-3	0.02	0.07	0.02	0.04	0.04	0.02	0.06	0.01	0.02	0.01	0.05	0.02	0.04	0.04	0.01	0.03	[illegible]
	4-7	0.40	0.34	0.35	0.27	0.21	0.17	0.27	0.24	0.18	0.29	0.33	0.31	0.27	0.21	0.24	0.26	04.31
	8-12	0.82	0.76	0.68	0.58	0.30	0.41	0.53	0.43	0.60	0.60	0.50	0.72	0.77	0.69	0.46	0.53	09.40
D	13-18	0.69	0.99	1.05	0.53	0.42	0.44	0.69	0.60	0.97	0.85	0.59	0.77	1.22	1.16	0.95	1.13	13.07
	19-24	0.43	0.24	0.41	0.40	0.25	0.35	0.34	0.71	0.82	0.68	0.43	0.62	1.00	1.33	0.99	0.86	09.87
	>24	0.11	0.01	0.27	0.21	0.18	0.25	0.29	0.39	0.96	0.63	0.26	0.85	1.54	1.48	0.55	0.24	06.44
	TOTALS	2.49	2.42	2.78	2.04	1.39	1.64	2.17	2.39	3.56	3.07	2.37	3.29	4.84	4.92	3.20	3.05	45.76

TABLE 2.3-32 (Cont'd)

STABILITY CATAGORY	SPEED (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
	Calm																	00.21
	1-3	0.01	0.06	0.04	0.01	0.01	0.00	0.03	0.01	0.01	0.02	0.01	0.03	0.01	0.04	0.01	0.04	00.35
	4-7	0.11	0.17	0.09	0.10	0.07	0.11	0.15	0.14	0.15	0.17	0.11	0.12	0.21	0.09	0.14	0.08	02.01
	8-12	0.18	0.28	0.24	0.24	0.21	0.17	0.17	0.21	0.17	0.23	0.38	0.35	0.27	0.19	0.27	0.18	03.75
E	13-18	0.18	0.27	0.33	0.45	0.42	0.40	0.30	0.32	0.36	0.47	0.43	0.62	0.47	0.47	0.36	0.32	06.20
	19-24	0.21	0.07	0.08	0.32	0.38	0.19	0.29	0.43	0.63	0.47	0.49	0.43	0.41	0.60	0.51	0.22	05.74
	>24	0.05	0.01	0.01	0.10	0.18	0.17	0.26	0.44	1.15	1.06	0.45	0.53	0.58	0.88	0.14	0.03	06.04
	TOTALS	0.76	0.85	0.79	1.21	1.28	1.05	1.21	1.55	2.48	2.42	1.87	2.08	1.97	2.27	1.43	0.88	24.30
	Calm																	00.07
	1-3	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.01	00.10
	4-7	0.03	0.05	0.07	0.02	0.07	0.08	0.10	0.06	0.06	0.04	0.05	0.07	0.07	0.04	0.05	0.01	00.87
	8-12	0.10	0.07	0.04	0.08	0.11	0.18	0.10	0.12	0.18	0.18	0.21	0.11	0.11	0.17	0.12	0.15	02.02
F	13-18	0.13	0.06	0.04	0.04	0.24	0.17	0.15	0.21	0.31	0.22	0.33	0.18	0.25	0.35	0.35	0.24	03.26
	19-24	0.03	0.00	0.02	0.07	0.17	0.19	0.33	0.21	0.35	0.40	0.45	0.25	0.46	0.37	0.42	0.11	03.82
	>24	0.04	0.00	0.01	0.00	0.02	0.09	0.30	0.32	0.65	0.85	0.74	0.33	0.28	0.24	0.04	0.01	03.94
	TOTALS	0.32	0.18	0.19	0.21	0.62	0.71	0.99	0.94	1.55	1.72	1.79	0.94	1.18	1.16	0.99	0.54	14.09
	Calm																	00.02
	1-3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	00.06
	4-7	0.02	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.03	0.03	0.05	0.04	0.03	0.02	0.02	00.29
	8-12	0.01	0.04	0.03	0.00	0.01	0.01	0.03	0.02	0.07	0.02	0.09	0.08	0.03	0.01	0.04	0.02	00.50
G	13-18	0.03	0.01	0.00	0.01	0.01	0.00	0.00	0.05	0.12	0.05	0.10	0.12	0.07	0.10	0.08	0.08	00.82
	19-24	0.05	0.01	0.00	0.01	0.01	0.04	0.10	0.13	0.16	0.15	0.13	0.06	0.10	0.07	0.05	0.01	01.08
	>24	0.00	0.00	0.00	0.00	0.01	0.00	0.09	0.10	0.21	0.31	0.43	0.12	0.09	0.01	0.04	0.00	01.40
	TOTALS	0.12	0.07	0.03	0.01	0.04	0.05	0.22	0.33	0.56	0.57	0.77	0.43	0.34	0.21	0.24	0.15	04.17
	Sector Totals(%)	4.14	4.17	4.58	4.13	3.95	3.84	5.03	5.93	9.11	8.81	7.82	7.77	9.43	9.50	6.38	4.94	99.53
	Calm	0.47															TOTAL	100.00

NOTE: Stability is based on 33- and 375-foot ΔT for the period of record October 1, 1976 - September 30, 1978.

TABLE 2.3-33

X/Q VALUES (sec/meter^3) AT EXCLUSION AREA BOUNDARY FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	ACTUAL SITE BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		8-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	.51	5.271-07	3.654-25	6.588-07	5.645-25	4.436-07	1.227-21	1.927-07	1.704-20	8.926-08	7.582-19	9.608-08	2.964-11
NNE	.51	6.313-07	3.398-25	4.517-07	3.427-25	2.905-07	7.600-25	1.634-07	5.430-23	8.236-08	5.607-20	4.148-08	4.621-11
NE	.51	2.851-07	2.940-25	2.557-07	3.032-25	1.346-07	7.314-29	9.696-08	3.069-26	5.092-08	3.310-22	3.037-08	5.507-10
ENE	.51	4.089-07	3.610-25	3.140-07	3.699-25	1.202-07	2.509-24	8.118-08	5.827-23	6.227-08	9.346-21	2.929-08	1.534-10
E	.51	3.750-07	4.116-21	2.768-07	3.689-21	1.205-07	2.839-21	9.994-08	3.445-21	6.377-08	1.118-19	2.914-08	2.957-10
ESE	.51	9.550-08	6.765-21	6.435-08	5.258-21	4.137-08	3.500-21	2.769-08	8.478-21	2.433-08	8.498-20	1.099-08	1.394-11
SE	.51	1.099-08	1.352-22	7.247-09	2.994-23	1.356-08	1.114-22	1.583-08	2.405-22	1.482-08	5.255-20	8.549-09	2.749-17
SSE	.51	3.0?6-09	3.234-21	1.992-09	2.162-21	1.678-09	4.476-22	3.290-09	2.892-22	8.766-09	7.038-21	6.347-09	9.777-19
S	.51	5.512-08	6.720-24	2.692-08	1.091-24	1.957-08	1.674-24	1.506-08	1.684-24	6.281-09	2.205-23	7.059-09	2.675-19
SSW	.51	8.424-08	1.680-22	6.186-08	1.832-23	3.039-08	2.743-24	2.682-08	1.183-24	3.057-08	3.203-23	1.041-08	4.735-13
SW	.51	2.031-07	7.908-21	1.008-07	5.488-21	1.221-07	1.997-21	3.293-08	3.687-22	2.532-08	3.337-22	1.500-08	1.528-14
WSW	.51	8.202-07	4.096-24	7.903-07	1.471-24	3.620-07	8.927-24	1.415-07	1.831-24	8.620-08	1.513-24	2.948-08	1.396-12
W	.51	7.155-07	2.246-25	5.756-07	3.367-25	3.595-07	1.016-27	1.485-07	4.169-27	6.847-08	8.058-25	1.201-08	3.604-12
WNW	.51	4.907-07	3.360-25	2.726-07	3.355-25	1.046-07	6.159-20	7.537-08	7.549-29	1.133-08	1.155-26	9.933-09	2.870-12
NW	.51	1.643-08	3.232-25	1.922-08	3.292-25	3.416-08	7.429-29	3.064-08	7.680-26	3.613-08	1.215-21	1.174-08	1.331-18
NNW	.51	8.412-07	3.498-25	5.315-07	3.596-25	1.563-07	4.946-24	1.621-07	1.017-22	7.978-08	1.084-20	3.209-08	4.905-17
ALL		2.798-07	3.750-25	1.828-07	6.127-25	1.161-07	5.673-24	8.311-08	7.880-23	5.401-08	3.244-21	2.360-08	2.413-12

TABLE 2.3-34

X/Q VALUES (sec/meter^3) AT ACTUAL SITE BOUNDARY FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	ACTIVE SITE BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		8-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	1.02	1.117-06	1.335-12	7.046-07	3.787-12	1.722-07	1.885-11	1.271-07	1.961-11	5.926-08	2.191-11	3.383-08	1.431-09
NNE	1.33	7.413-07	1.133-10	8.607-07	7.423-11	1.600-07	1.096-10	1.150-07	8.727-11	4.268-08	1.224-10	2.670-08	2.306-09
NE	2.41	8.[illegible]90-07	2.205-08	7.843-07	2.257-08	1.639-07	8.065-09	1.151-07	2.395-09	4.378-08	1.556-09	1.172-08	3.053-09
ENE	4.45	1.895-[illegible]	2.102-0[illegible]	1.503-06	1.448-07	5.619-07	7.533-08	1.301-07	1.349-08	5.220-08	6.304-09	1.484-08	7.907-09
E	1.97	6.801-07	5.388-08	6.135-07	2.727-08	1.631-07	1.058-08	1.222-07	2.532-09	5.088-08	1.846-09	1.197-08	4.140-09
ESE	.84	8.653-07	1.341-12	5.866-07	9.743-13	1.437-07	5.642-13	1.071-07	3.[illegible]80-13	4.603-08	4.079-13	2.919-08	3.604-10
SE	.88	5.450-07	9.734-13	2.406-07	5.039-13	1.189-07	1.816-13	7.672-08	2.067-13	4.166-08	7.163-13	2.296-08	1.074-11
SSE	.84	2.0[illegible]2-07	1.032-12	1.904-07	5.705-13	7.906-08	1.054-13	5.125-08	5.607-14	1.346-08	1.240-13	1.902-08	6.688-13
S	.83	6.787-07	7.258-14	7.179-07	1.875-14	1.589-07	1.614-14	9.614-08	6.720-15	2.057-08	7.633-15	1.484-08	2.354-13
SSW	.83	6.897-07	1.548-13	7.459-07	7.004-14	1.485-07	2.196-14	1.144-07	6.660-15	3.755-08	6.510-15	2.948-08	1.646-10
SW	.61	8.629-07	5.343-17	2.595-07	4.636-17	1.656-07	6.406-18	1.222-07	1.905-18	3.819-08	1.442-18	1.449-08	5.467-13
WSW	.51	4.927-07	1.567-24	5.049-07	2.789-24	3.926-07	1.705-23	1.193-07	2.218-24	5.597-08	1.641-24	2.878-08	1.349-12
W	.51	7.026-07	4.419-29	7.045-07	2.160-28	3.873-07	1.288-27	1.431-07	4.033-27	5.349-08	1.023-24	1.190-08	3.481-12
WNW	.63	[illegible].269-07	7.884-22	9.661-07	5.417-22	1.533-07	1.051-22	1.249-07	1.175-22	2.165-08	7.638-22	2.525-08	3.078-11
NW	.73	2.373-07	1.202-18	2.514-07	1.017-18	1.168-07	4.973-19	8.524-08	1.019-17	3.685-08	1.084-15	1.432-08	6.505-14
NNW	.85	1.109-06	2.864-15	1.023-06	4.737-15	3.556-07	3.643-14	2.935-07	8.223-14	5.731-08	1.751-13	3.292-08	8.023-12
ALL		1.136-06	4.030-12	7.603-07	3.215-12	1.671-07	3.160-12	1.192-07	1.789-12	4.763-08	1.907-12	2.331-08	5.410-10

TABLE 2.3-35

X/Q VALUES (sec/meter^3) AT LOW POPULATION ZONE BOUNDARY FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	LPZ BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		8-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	6.40	4.060-07	2.175-07	3.761-07	1.482-07	2.257-07	5.935-08	5.734-08	1.503-08	2.481-08	7.910-09	1.073-08	5.695-09
NNE	6.40	4.061-07	2.155-07	3.747-07	1.377-07	2.032-07	5.131-08	5.166-08	1.189-08	2.214-08	5.365-09	1.143-08	6.063-09
NE	6.40	4.039-07	2.081-07	3.517-07	1.205-07	1.812-07	4.568-08	4.548-08	9.682-09	1.922-08	4.320-09	9.494-09	5.261-09
ENE	6.40	4.075-07	2.515-07	3.718-07	1.695-07	2.124-07	5.428-08	5.379-08	1.222-08	2.210-08	5.911-09	1.208-08	6.018-09
E	6.40	4.089-07	2.631-07	3.889-07	1.749-07	2.388-07	6.123-08	6.534-08	1.585-08	3.136-08	7.576-09	1.827-08	7.681-09
ESE	6.40	4.046-07	2.608-07	3.755-07	1.848-07	2.623-07	6.997-08	7.148-08	1.613-08	3.704-08	7.561-09	2.464-08	5.976-09
SE	6.40	4.084-07	2.834-07	3.811-07	1.807-07	2.440-07	6.068-08	6.600-08	1.400-08	2.655-08	5.936-09	1.404-08	6.064-09
SSE	6.40	4.105-07	3.238-07	3.954-07	1.933-07	2.604-07	7.510-08	7.166-08	1.632-08	3.097-08	6.986-09	1.019-08	4.882-09
S	6.40	4.124-07	3.359-07	3.992-07	1.871-07	2.716-07	5.859-08	6.937-08	1.186-08	2.454-08	3.949-09	7.178-09	3.619-09
SSW	6.40	4.149-07	3.540-07	4.051-07	2.007-07	2.976-07	7.231-08	8.571-08	1.532-08	3.541-08	5.565-09	1.438-09	3.327-09
SW	6.40	4.134-07	3.359-07	4.019-07	2.030-07	2.824-07	7.681-08	8.404-08	1.783-08	4.109-08	5.702-09	1.447-08	3.990-09
WSW	6.40	4.109-07	2.9[illegible]3-07	3.938-07	1.847-07	2.383-07	6.599-08	6.586-08	1.529-08	2.654-08	4.800-09	9.820-09	4.002-09
W	6.40	4.075-07	2.379-07	3.656-07	1.604-07	1.916-07	5.068-08	5.160-08	1.130-08	1.994-08	4.316-09	8.114-09	3.210-09
WNW	6.40	4.111-07	2.665-07	3.857-07	1.637-07	2.196-07	5.113-08	5.216-08	1.055-08	2.168-08	3.357-09	8.569-09	3.793-09
NW	6.40	4.114-07	2.406-07	3.321-07	1.610-07	2.352-07	5.735-08	5.906-08	1.396-08	2.201-08	5.088-09	9.981-09	3.735-09
NNW	6.40	4.064-07	2.267-07	3.732-07	1.553-07	2.198-07	5.284-08	5.984-08	1.206-08	2.574-08	4.821-09	1.196-08	3.990-09
ALL		4.092-07	2.630-07	3.866-07	1.708-07	2.358-07	5.752-08	6.252-08	1.332-08	2.601-08	5.621-09	1.337-08	4.956-09

TABLE 2.3-36

FIFTH PERCENTILE X/Q VALUES ($sec/meter^3$) FOR THE PERIOD OF 0-1 HOUR FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	2.225-15	3.782-08	1.432-07	2.085-07	2.310-07	1.821-07	1.025-07	6.973-08	5.564-08	4.295-08
NNE	2.549-16	3.003-08	1.355-07	2.054-07	2.286-07	1.804-07	1.018-07	6.966-08	5.795-08	4.598-08
NE	7.193-18	1.701-08	1.210-07	1.901-07	2.145-07	1.736-07	9.369-08	7.142-08	6.096-08	5.202-08
ENE	8.439-16	3.813-08	1.570-07	2.475-07	2.514-07	1.985-07	1.134-07	7.437-08	5.879-08	4.540-08
E	3.906-13	9.317-08	2.479-07	2.654-07	2.513-07	1.915-07	1.042-07	6.946-08	5.147-08	3.696-08
ESE	4.521-13	9.757-08	2.528-07	2.696-07	2.530-07	1.959-07	1.053-07	6.755-08	4.960-08	3.656-08
SE	8.257-14	8.055-08	2.061-07	2.930-07	2.773-07	2.105-07	1.109-07	7.526-08	5.667-08	4.257-08
SSE	3.366-13	9.571-08	2.807-07	3.260-07	3.148-07	2.381-07	1.249-07	7.748-03	5.400-08	3.942-08
S	3.052-14	7.094-08	2.532-07	3.256-07	3.284-07	2.655-07	1.456-07	9.056-08	6.430-08	4.800-08
SSW	1.017-13	8.292-08	2.681-07	3.477-07	3.425-07	2.795-07	1.557-07	9.143-08	6.161-08	4.629-08
SW	5.430-13	1.078-07	2.823-07	3.325-07	3.270-07	2.644-07	1.380-07	7.978-08	5.420-08	3.359-08
WSW	2.058-14	6.534-08	1.886-07	2.845-07	2.944-07	2.414-07	1.435-07	9.224-08	6.689-08	5.091-03
W	4.264-17	1.957-06	1.398-07	2.257-07	2.479-07	2.117-07	1.278-07	6.899-08	7.170-08	5.824-08
WNW	1.061-16	2.695-08	1.526-07	2.526-07	2.644-07	2.204-07	1.245-07	8.675-08	6.903-08	5.566-08
NW	6.756-17	2.105-08	1.470-07	2.438-07	2.489-07	2.076-07	1.230-07	8.131-08	6.327-08	5.351-08
NNW	3.176-16	3.353-08	1.409-07	2.156-07	2.425-07	1.993-07	1.095-07	7.193-08	5.855-08	4.549-08
ALL	3.466-15	4.992-08	1.669-07	2.572-07	2.601-07	2.061-07	1.149-07	7.536-08	5.824-08	4.507-08

TABLE 2.3-37

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THF TIME PERIOD OF 0-2 HOURS FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	3.444-15	3.195-08	1.101-07	1.471-07	1.450-07	1.181-07	7.236-08	5.029-08	3.699-08	2.973-08
NNE	2.969-16	1.981-08	8.744-08	1.317-07	1.360-07	1.127-07	6.970-08	5.078-08	3.745-08	3.097-08
NE	8.456-18	1.181-08	7.587-08	1.165-07	1.241-07	1.013-07	6.798-08	4.956-08	3.729-08	3.076-08
ENE	2.428-15	2.866-08	1.224-07	1.636-07	1.673-07	1.341-07	7.679-08	4.947-08	3.560-08	2.851-08
E	3.111-13	5.572-08	1.434-07	1.731-07	1.728-07	1.392-07	7.668-08	4.821-08	3.447-08	2.712-08
ESE	4.089-13	5.743-08	1.445-07	1.808-07	1.798-07	1.406-07	8.028-08	5.045-08	3.553-08	2.775-08
SE	2.830-14	4.222-08	1.370-07	1.780-07	1.800-07	1.507-07	8.490-08	5.403-08	3.913-08	3.045-08
SSE	2.098-13	5.355-08	1.617-07	1.871-07	1.915-07	1.734-07	9.622-08	5.966-08	4.195-08	3.124-08
S	7.721-15	3.895-08	1.406-07	1.805-07	1.869-07	1.715-07	1.027-07	6.373-08	4.544-08	3.421-08
SSW	2.192-14	4.420-08	1.552-07	1.924-07	1.984-07	1.777-07	1.129-07	7.026-08	4.744-08	3.523-08
SW	4.271-13	6.418-08	1.666-07	1.934-07	1.987-07	1.731-07	9.991-08	6.212-08	4.323-08	3.148-08
WSW	9.875-15	4.210-08	1.366-07	1.780-07	1.833-07	1.625-07	9.753-08	6.240-08	4.463-08	3.416-08
W	7.086-17	1.793-08	1.072-07	1.580-07	1.606-07	1.403-07	8.764-08	6.313-08	4.712-08	3.817-08
WNW	8.926-17	1.767-08	1.055-07	1.566-07	1.636-07	1.416-07	8.607-08	5.894-08	4.449-08	3.584-08
NW	4.[illegible]20-17	1.635-08	1.010-07	1.546-07	1.627-07	1.339-07	8.344-08	6.039-08	4.430-08	3.553-08
NNW	9.605-16	2.371-08	1.078-07	1.527-07	1.531-07	1.249-07	7.597-08	5.320-08	3.841-08	2.053-08
ALL	4.527-15	3.390-08	1.271-07	1.666-07	1.703-07	1.404-07	8.215-08	5.454-08	3.955-08	3.084-08

TABLE 2.3-38

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE PERIOD OF 0-8 HOURS FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	7.020-14	1.774-08	4.531-08	5.441-08	5.929-08	5.075-08	3.472-08	2.489-08	1.856-08	1.475-08
NNE	1.573-15	1.080-08	3.782-08	4.718-08	5.076-08	4.513-08	3.176-08	2.349-08	1.683-08	1.381-08
NE	3.247-17	5.849-09	3.173-08	4.391-08	4.561-08	4.246-08	2.976-08	2.057-08	1.503-08	1.225-08
ENE	6.665-15	1.[illegible]92-08	4.029-08	4.889-08	5.210-08	4.683-08	3.029-08	2.126-08	1.591-08	1.286-08
E	1.524-13	1.950-08	4.804-08	5.583-08	6.211-08	5.343-08	3.521-08	2.440-08	1.749-08	1.355-08
ESE	1.400-13	1.941-08	5.244-08	6.969-08	7.086-08	5.899-08	3.653-08	2.495-08	1.748-08	1.401-08
SE	2.467-14	1.319-08	4.195-08	5.274-08	6.254-08	5.571-08	3.558-08	2.605-08	1.812-08	1.471-08
SSE	4.381-14	1.654-08	4.890-08	7.002-08	7.705-08	6.513-08	4.139-08	2.791-08	1.965-08	1.563-08
S	6.641-15	1.215-08	4.136-08	4.961-08	6.035-08	5.818-08	3.896-08	2.767-08	1.946-08	1.583-08
SSW	8.259-15	1.232-08	4.733-08	6.425-08	7.801-08	6.903-08	4.141-08	2.982-08	2.076-08	1.639-08
SW	6.825-14	2.022-08	5.550-08	7.429-08	7.727-08	6.634-08	3.933-08	2.820-08	1.868-08	1.510-08
WSW	1.903-14	1.442-08	4.634-08	6.219-08	6.931-08	6.128-08	3.798-08	2.638-08	1.[illegible]-08	1.440-08
W	1.025-16	7.697-09	3.641-08	4.814-08	5.089-08	4.733-08	3.402-08	2.581-08	1.806-08	1.487-08
WNW	3.071-17	5.637-09	3.435-08	4.709-08	5.031-08	4.755-08	3.388-08	2.600-08	1.945-08	1.561-08
NW	3.943-17	7.035-09	3.869-08	4.987-08	5.808-08	5.412-08	3.594-08	2.749-08	2.047-08	1.710-08
NNW	1.188-14	1.291-08	3.951-08	4.836-08	5.095-08	4.607-08	3.121-08	2.266-08	1.646-08	1.348-08
ALL	1.250-14	1.323-08	4.168-08	4.995-08	5.764-08	5.016-08	3.462-08	2.501-08	1.783-08	1.436-08

TABLE 2.3-39

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

8-24 HOURS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.475-13	6.309-09	1.404-08	1.516-08	1.461-08	1.120-08	6.418-09	3.960-09	2.800-09	2.137-09
NNE	5.810-15	3.854-09	9.542-09	1.172-08	1.169-08	9.299-09	5.413-09	3.581-09	2.428-09	1.876-09
NE	1.804-16	2.032-09	7.946-09	9.670-09	9.556-09	8.168-09	4.965-09	3.224-09	2.248-09	1.701-09
ENE	5.868-15	3.411-09	9.021-09	1.155-08	1.210-08	8.971-09	5.310-09	3.383-09	2.332-09	1.783-09
E	7.190-14	5.918-09	1.321-08	1.555-08	1.551-08	1.204-08	6.475-09	4.006-09	2.747-09	2.082-09
ESE	1.079-13	5.680-09	1.358-08	1.636-08	1.602-08	1.263-08	6.869-09	4.025-09	2.768-09	2.059-09
SE	1.426-14	3.668-09	9.396-09	1.381-08	1.388-08	1.126-08	6.204-09	3.832-09	2.661-09	1.990-09
SSE	1.718-12	4.501-09	1.083-08	1.621-08	1.637-08	1.375-08	7.660-09	4.404-09	3.003-09	2.278-09
S	2.757-15	3.101-09	8.823-09	1.095-08	1.238-08	1.013-08	6.196-09	3.997-09	2.737-09	2.046-09
SSW	1.866-15	2.792-09	9.049-09	1.383-08	1.580-08	1.446-08	8.077-09	4.691-09	3.199-09	2.402-09
SW	1.892-14	4.888-09	1.453-08	1.713-08	1.794-08	1.344-08	7.552-09	4.484-09	3.127-09	2.354-09
WSW	2.707-15	5.532-09	1.017-08	1.427-08	1.562-08	1.287-08	7.272-09	4.253-09	2.923-09	2.220-09
W	1.635-16	1.751-09	8.322-09	1.068-08	1.106-08	9.148-09	5.862-09	3.721-09	2.602-09	1.982-09
WNW	1.522-17	1.437-09	7.639-09	1.023-08	1.034-08	9.186-09	5.940-09	3.749-09	2.737-09	2.032-09
NW	3.143-16	2.554-09	8.835-09	1.293-08	1.416-08	1.152-08	6.442-09	3.988-09	2.921-09	2.259-09
NNW	1.502-14	3.816-09	9.062-09	1.162-08	1.211-08	8.585-09	5.322-09	3.487-09	2.425-09	1.880-09
ALL	6.389-15	3.762-09	9.737-09	1.279-08	1.326-08	1.058-08	6.126-09	3.828-09	2.646-09	2.005-09

TABLE 2.3-40

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

1-4 DAYS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	5.233-13	4.013-09	7.532-09	7.792-09	7.655-09	5.531-09	3.086-09	1.973-09	1.291-09	9.748-10
NNE	1.330-13	2.233-09	4.303-09	5.258-09	5.354-09	4.337-09	2.677-09	1.701-09	1.220-09	9.337-10
NE	1.060-14	1.307-09	3.473-09	4.158-09	4.227-09	3.918-09	2.054-09	1.311-09	9.319-10	7.125-10
ENE	5.264-14	1.579-09	4.465-09	5.798-09	5.891-09	4.622-09	2.528-09	1.554-09	1.059-09	7.990-10
E	1.849-13	3.148-09	6.783-09	7.616-09	7.331-09	5.543-09	3.017-09	1.914-09	1.247-09	9.538-10
ESE	1.728-13	3.031-09	6.813-09	7.488-09	7.245-09	5.611-09	2.976-09	1.904-09	1.248-09	9.527-10
SE	1.051-13	1.899-09	4.889-09	5.861-09	5.859-09	4.675-09	2.791-09	1.759-09	1.201-09	8.937-10
SSE	4.524-14	1.841-09	5.764-09	6.833-09	6.675-09	5.072-09	2.606-09	1.551-09	1.047-09	8.158-10
S	3.399-15	1.110-09	3.684-09	3.909-09	4.257-09	3.926-09	2.256-09	1.335-09	9.036-10	6.758-10
SSW	2.984-15	9.044-10	3.588-09	5.210-09	5.819-09	4.827-09	2.667-09	1.560-09	1.055-09	7.910-10
SW	1.207-14	1.724-09	4.985-09	5.031-09	5.787-09	5.139-09	2.694-09	1.737-09	1.054-09	8.120-10
WSW	1.105-15	8.733-10	3.404-09	4.892-09	4.898-09	4.296-09	2.520-09	1.507-09	1.004-09	7.720-10
W	6.649-16	7.072-10	2.926-09	4.008-09	4.250-09	4.136-09	2.237-09	1.432-09	1.023-09	7.734-10
WNW	6.927-17	5.577-10	2.158-09	2.9[illegible]2-09	3.381-09	3.804-09	1.989-09	1.269-09	8.541-10	6.834-10
NW	2.377-14	1.453-09	4.229-09	5.058-09	4.791-09	4.281-09	2.398-09	1.564-09	1.097-09	8.250-10
NNW	4.092-14	1.598-09	4.202-09	5.022-09	4.640-09	4.065-09	2.207-09	1.398-09	9.976-10	7.569-10
ALL	3.306-14	1.699-09	4.466-09	5.538-09	5.581-09	4.538-09	2.557-09	1.606-09	1.088-09	8.326-10

TABLE 2.3-41

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE PERIOD OF 4-30 DAYS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	8.002-10	3.812-09	6.544-09	6.939-09	6.317-09	4.842-09	2.605-09	1.651-09	1.119-09	8.613-10
NNE	1.155-09	3.323-09	5.268-09	5.977-09	5.904-09	4.450-09	2.647-09	1.822-09	1.184-09	9.223-10
NE	2.575-09	3.025-09	4.900-09	5.174-09	5.081-09	3.938-09	2.389-09	1.686-09	1.107-09	8.335-10
ENE	9.480-10	3.765-09	5.700-09	5.842-09	5.888-09	4.450-09	2.458-09	1.510-09	1.031-09	7.886-10
E	2.027-09	4.911-09	7.924-09	7.703-09	7.211-09	5.211-09	2.985-09	1.775-09	1.182-09	9.390-10
ESE	2.938-10	5.423-09	6.214-09	5.852-09	5.658-09	3.827-09	2.077-09	1.272-09	8.282-10	6.246-10
SE	2.198-12	3.269-09	5.772-09	5.760-09	5.800-09	4.187-09	2.287-09	1.385-09	9.822-10	7.198-10
SSE	3.181-13	2.275-09	4.855-09	5.167-09	4.829-09	3.774-09	1.995-09	1.185-09	7.985-10	5.995-10
S	1.508-13	1.376-09	3.029-09	3.442-09	3.424-09	2.634-09	1.426-09	8.480-10	5.336-10	4.081-10
SSW	8.050-11	1.483-09	3.511-09	3.550-09	3.207-09	2.509-09	1.381-09	8.853-10	5.329-10	4.275-10
SW	3.284-11	1.488-09	3.251-09	3.772-09	3.899-09	3.066-09	1.709-09	9.962-10	7.051-10	4.909-10
WSW	1.144-10	9.892-10	3.178-09	3.802-09	3.908-09	3.564-09	2.112-09	1.065-09	7.863-10	5.954-10
W	2.486-10	1.735-09	2.699-09	3.278-09	3.173-09	2.617-09	1.550-09	9.533-10	6.282-10	4.839-10
WNW	1.652-10	1.366-09	2.969-09	3.768-09	3.704-09	2.966-09	1.767-09	9.930-10	7.240-10	5.735-10
NW	3.522-13	1.398-09	3.241-09	3.722-09	3.710-09	2.886-09	1.715-09	1.071-09	7.743-10	5.760-10
NNW	3.599-12	1.811-09	3.596-09	4.006-09	3.903-09	3.036-09	1.736-09	1.065-09	6.877-10	5.212-10
ALL	2.212-10	2.610-09	4.571-09	4.962-09	4.865-09	3.734-09	2.072-09	1.245-09	8.538-10	6.570-10

AMENDMENT 43
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TABLE 2.3-42

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-1 HOUR FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	6.761-07	3.104-07	3.800-07	4.004-07	4.386-07	3.548-07	2.524-07	1.710-07	1.359-07	1.197-07
NNE	6.455-07	3.170-07	3.785-07	4.004-07	4.468-07	3.801-07	2.753-07	1.881-07	1.511-07	1.298-07
NE	5.876-07	4.458-07	3.787-07	3.976-07	4.416-07	3.837-07	2.842-07	1.954-07	1.555-07	1.353-07
ENE	5.676-07	4.430-07	3.829-07	4.026-07	4.571-07	3.899-07	2.936-07	2.041-07	1.633-07	1.398-07
E	5.124-07	3.364-07	3.819-07	4.035-07	4.570-07	3.849-07	2.786-07	1.947-07	1.577-07	1.381-07
ESE	4.604-07	3.296-07	3.828-07	4.008-07	4.405-07	3.618-07	2.547-07	1.678-07	1.304-07	1.146-07
SE	2.291-07	3.183-07	3.879-07	4.032-07	4.565-07	3.937-07	3.053-07	2.100-07	1.681-07	1.417-07
SSE	1.748-07	3.123-07	3.873-07	4.057-07	4.648-07	3.916-07	3.112-07	2.089-07	1.620-07	1.434-07
S	4.693-07	4.436-07	3.882-07	4.068-07	4.804-07	4.213-07	3.364-07	2.236-07	1.765-07	1.530-07
SSW	4.994-07	7.552-07	3.963-07	4.107-07	4.838-07	5.367-07	4.206-07	2.932-07	2.246-07	1.929-07
SW	1.193-06	7.271-07	4.402-07	4.098-07	4.737-07	3.916-07	3.187-07	2.122-07	1.801-07	1.520-07
WSW	1.431-06	5.666-07	3.881-07	4.054-07	4.725-07	3.956-07	3.260-07	2.144-07	1.766-07	1.523-07
W	9.876-07	5.590-07	3.878-07	4.040-07	4.577-07	3.938-07	3.257-07	2.146-07	1.800-07	1.580-07
WNW	7.719-07	3.126-07	3.814-07	4.045-07	4.667-07	3.911-07	3.146-07	2.116-07	1.729-07	1.523-07
NW	2.829-07	3.814-07	3.825-07	4.051-07	4.695-07	4.446-07	3.457-07	2.343-07	2.005-07	1.781-07
NNW	1.060-06	3.129-07	3.812-07	4.000-07	4.535-07	3.881-07	3.126-07	2.084-07	1.713-07	1.488-07
ALL	6.062-07	3.996-07	3.848-07	4.040-07	4.608-07	3.886-07	3.033-07	2.050-07	1.633-07	1.436-07

TABLE 2.3-43

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-2 HOURS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	5.598-07	2.917-07	3.590-07	3.760-07	3.695-07	2.967-07	1.873-07	1.235-07	9.677-08	8.536-08
NNE	4.714-07	2.836-07	3.524-07	3.709-07	3.716-07	3.105-07	2.009-07	1.320-07	1.043-07	9.170-08
NE	4.698-07	3.192-07	3.360-07	3.437-07	3.543-07	3.115-07	2.096-07	1.423-07	1.133-07	9.728-08
ENE	4.662-07	3.406-07	3.523-07	3.641-07	3.748-07	3.255-07	2.162-07	1.453-07	1.083-07	9.405-08
E	4.761-07	3.023-07	3.643-07	3.814-07	3.812-07	3.160-07	2.062-07	1.409-07	1.077-07	9.354-08
ESE	3.584-07	3.097-07	3.693-07	3.766-07	3.747-07	3.121-07	1.959-07	1.273-07	9.892-08	8.513-08
SE	2.149-07	3. 39-07	3.745-07	3.822-07	3.777-07	3.139-07	2.072-07	1.410-07	1.117-07	9.723-08
SSE	1.329-07	3.067-07	3.782-07	3.917-07	3.903-07	3.492-07	2.331-07	1.546-07	1.218-07	1.055-07
S	4.152-07	3.165-07	3.750-07	3.937-07	4.365-07	3.545-07	2.397-07	1.560-07	1.249-07	1.050-07
SSW	4.303-07	5.325-07	3.848-07	4.011-07	4.346-07	3.922-07	3.088-07	2.130-07	1.738-07	1.407-07
SW	6.547-07	5.332-07	3.892-07	3.992-07	4.047-07	3.558-07	2.410-07	1.641-07	1.352-07	1.127-07
WSW	6.710-07	4.335-07	3.675-07	3.885-07	4.127-07	3.619-07	2.479-07	1.691-07	1.290-07	1.054-07
W	6.044-07	3.882-07	3.556-07	3.656-07	3.636-07	3.201-07	2.219-07	1.520-07	1.228-07	1.070-07
WNW	5.161-07	2.537-07	3.600-07	3.813-07	3.814-07	3.303-07	2.300-07	1.580-07	1.307-07	1.[illegible]32-07
NW	2.486-07	3.056-07	3.627-07	3.668-07	4.037-07	3.518-07	2.535-07	1.779-07	1.409-07	1.190-07
NNW	6.[illegible]34-07	2.941-07	3.617-07	3.713-07	3.768-07	3.238-07	2.158-07	1.443-07	1.157-07	9.717-08
ALL	4.720-07	3.150-07	3.676-07	3.830-07	3.844-07	3.330-07	2.174-07	1.481-07	1.187-07	1.002-07

TABLE 2.3-44

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-8 HOURS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	2.534-07	1.608-07	2.126-07	2.260-07	2.223-07	1.719-07	1.075-07	8.487-08	5.681-08	4.929-08
NNE	1.595-07	1.418-07	1.849-07	1.976-07	1.991-07	1.603-07	1.042-07	6.859-08	5.499-08	4.794-08
NE	1.824-07	1.616-07	1.591-07	1.775-07	1.775-07	1.533-07	1.065-07	8.943-08	6.116-08	5.343-08
ENE	1.631-07	1.759-07	1.951-07	2.082-07	2.122-07	1.728-07	1.116-07	8.439-08	5.663-08	4.733-08
E	1.[illegible]34-07	1.781-07	2.365-07	2.416-07	2.331-07	1.814-07	1.085-07	7.356-08	5.[illegible]-08	4.870-08
ESE	1.187-07	1.875-07	2.480-07	2.641-07	2.526-07	[illegible].907-07	1.106-07	8.999-08	5.890-08	5.072-08
SE	8.993-08	1.751-07	2.363-07	2.475-07	2.416-07	1.865-07	1.156-07	9.757-08	6.317-08	5.439-08
SSE	5.588-08	1.735-07	2.493-07	2.613-07	2.455-07	2.015-07	1.240-07	1.010-07	6.1[illegible]6-08	5.421-08
S	1.304-07	1.646-07	2.330-07	2.697-07	2.694-07	2.243-07	1.350-07	1.088-07	6.335-08	5.296-08
SSW	1.225-07	3.160-07	2.838-07	2.974-07	2.990-07	2.448-07	1.630-07	1.277-07	8.807-08	7.400-08
SW	2.351-07	2.525-07	2.727-07	2.844-07	2.774-07	2.195-07	1.347-07	1.083-07	6.622-08	5.392-08
WSW	2.821-07	1.910-07	2.237-07	2.306-07	2.403-07	2.135-07	1.371-07	1.153-07	6.886-08	5.525-08
W	2.832-07	1.642-07	1.843-07	1.901-07	1.913-07	1.633-07	1.135-07	1.011-07	6.[illegible]21-08	5.587-08
WNW	1.[illegible]88-07	1.391-07	1.973-07	2.165-07	2.148-07	1.815-07	1.174-07	9.713-08	[illegible]	5.286-08
NW	9.785-08	1.618-07	2.015-07	2.294-07	2.316-07	2.084-07	1.389-07	1.129-07	7.337-08	6.240-08
NNW	2.430-07	1.535-07	1.966-07	2.097-07	2.178-07	1.763-07	1.102-07	8.691-08	5.638-08	5.082-08
ALL	1.630-07	1.764-07	2.232-07	2.345-07	2.330-07	1.896-07	1.192-07	9.711-08	6.077-08	5.249-08

TABLE 2.3-45

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 8-24 HOURS FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.538-07	5.631-08	6.011-08	6.131-08	5.509-08	4.019-08	2.111-06	1.450-08	8.969-09	7.127-09
NNE	[illegible]	5.398-08	5.320-08	5.482-08	4.816-08	3.536-08	1.919-08	1.392-08	7.651-09	6.014-09
NE	1.194-07	6.246-08	4.911-08	4.710-08	4.320-08	3.188-08	1.904-08	1.402-08	8.358-09	6.950-09
ENE	1.226-07	5.751-08	5.760-08	5.630-08	5.116-08	3.816-08	2.136-08	1.454-08	8.613-09	6.906-09
E	1.282-07	6.016-08	7.281-08	6.670-08	6.051-08	4.254-08	2.275-08	1.502-08	8.871-09	6.991-09
ESE	9.259-08	[illegible]	7.818-08	7.846-08	6.837-08	4.800-08	2.426-08	1.502-08	9.346-09	7.301-09
SE	8.173-08	[illegible]	6.966-08	6.877-08	6.279-08	4.403-08	2.328-08	1.504-08	9.233-09	7.325-09
SSE	3.821-08	5.567-08	7.814-08	7.693-08	6.699-08	4.796-08	2.461-08	1.526-08	9.463-09	7.399-09
S	9.718-08	5.308-08	6.385-08	6.625-08	6.711-08	5.265-08	2.887-08	1.630-08	1.060-08	8.007-09
SSW	1.129-07	1.075-07	9.198-08	8.654-08	8.267-08	6.001-08	3.495-08	2.386-08	1.350-08	1.083-08
SW	1.415-07	1.006-07	8.871-08	8.822-08	7.850-08	5.516-08	2.850-08	1.624-08	1.065-08	8.177-09
WSW	1.305-07	8.841-08	7.097-08	6.815-08	6.334-08	4.755-08	2.850-08	1.674-08	1.158-08	8.162-09
W	1.249-07	7.278-08	5.838-08	5.466-08	4.810-08	3.485-08	1.905-08	1.429-08	8.673-09	7.269-09
WNW	[illegible]	5.443-08	6.041-08	[illegible]	5.627-08	4.089-08	2.275-08	1.501-08	9.137-09	7.371-09
NW	[illegible]	6.401-08	5.857-08	6.352-08	5.748-08	4.619-08	2.901-08	1.756-08	1.192-08	9.531-09
NNW	[illegible]	5.715-08	5.747-08	5.655-08	5.295-08	3.990-08	2.172-08	1.478-08	8.846-09	7.012-09
ALL	1.214-07	6.243-08	6.553-08	6.429-08	5.876-08	4.295-08	2.369-08	1.528-08	9.451-09	7.471-09

TABLE 2.3-46

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 1-4 DAYS FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	5.253-08	2.306-08	2.383-08	2.535-08	2.379-08	1.789-08	9.593-09	6.005-09	4.095-09	3.095-09
NNE	5.088-08	2.238-08	2.176-08	2.352-08	2.102-08	1.601-08	9.000-09	5.478-09	3.836-09	2.977-09
NE	4.799-08	2.503-08	1.940-08	2.057-08	1.827-08	1.431-08	9.041-09	5.826-09	4.099-09	3.455-09
ENE	3.[illegible]30-08	2.317-08	2.320-08	2.342-08	2.104-08	1.614-08	9.643-09	5.965-09	4.130-09	3.021-09
E	4.[illegible]71-08	2.[illegible]54-08	3.242-08	3.290-08	2.967-08	2.072-08	1.169-08	8.032-09	5.094-09	3.959-09
ESE	4.293-08	2.827-08	3.599-08	3.787-08	3.544-08	2.585-08	1.312-08	8.328-09	5.214-09	3.914-09
SE	1.805-08	2.[illegible]00-08	2.919-08	2.981-08	2.541-08	1.861-08	9.627-09	5.572-09	3.960-09	2.993-09
SSE	1.834-08	2.439-08	3.233-08	3.[illegible]40-08	2.939-08	2.067-08	1.115-08	7.326-09	4.298-09	3.262-09
S	3.197-08	1.467-08	2.445-08	2.610-08	2.387-08	1.852-08	1.100-08	8.383-09	4.833-09	3.854-09
SSW	2.929-08	4.652-08	3.645-08	3.616-08	3.346-08	2.598-08	1.523-08	9.912-09	6.635-09	5.327-09
SW	3.979-08	4.552-08	4.317-08	4.343-08	3.865-08	2.583-08	1.353-08	8.736-09	5.034-09	3.835-09
WSW	6.769-08	5.625-08	2.985-08	2.998-08	2.558-08	1.765-08	1.051-08	7.566-09	4.710-09	3.756-09
W	5.259-08	2.526-08	2.252-08	2.087-08	1.901-08	1.318-08	7.512-09	5.124-09	3.122-09	2.549-09
WNW	1.[illegible]68-08	1.454-08	2.131-08	2.259-08	2.143-08	1.712-08	9.045-09	5.506-09	3.717-09	2.843-09
NW	1.849-08	1.[illegible]94-08	2.026-08	2.266-08	2.268-08	1.886-08	1.157-08	9.503-09	5.315-09	4.119-09
NNW	6.035-08	2.506-08	2.571-08	2.797-08	2.436-08	1.788-08	1.006-08	6.161-09	4.115-09	3.116-09
ALL	4.526-08	2.591-08	2.616-08	2.762-08	2.502-08	1.865-08	1.064-08	7.131-09	4.461-09	3.505-09

TABLE 2.3-47

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD 4-30 DAYS FOR EFFLUENTS

RELEASED FROM PLANT COMMON STACK

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	5.266-08	1.263-08	1.063-08	1.105-08	1.035-08	8.596-09	4.380-09	2.804-09	2.094-09	1.563-09
NNE	4.546-08	1.096-08	1.100-08	1.101-08	1.050-08	8.275-09	4.664-09	3.231-09	2.165-09	1.904-09
NE	1.774-08	1.226-08	9.059-09	8.791-09	9.182-09	6.992-09	4.210-09	2.753-09	1.962-09	1.536-09
ENE	3.013-08	1.152-08	1.113-08	1.258-08	1.170-08	9.191-09	5.280-09	4.421-09	2.334-09	2.072-09
E	1.873-08	1.316-08	1.722-08	1.793-08	1.756-08	1.218-08	6.470-09	4.910-09	2.502-09	2.359-09
ESE	3.670-08	1.412-08	2.365-08	2.223-08	2.334-08	1.570-08	8.384-09	5.014-09	3.535-09	2.588-09
SE	1.968-08	1.324-08	1.376-08	1.440-08	1.352-08	9.924-09	5.361-09	2.904-09	1.997-09	1.554-09
SSE	2.190-08	1.733-08	1.100-08	1.092-08	9.593-09	6.897-09	4.075-09	2.618-09	1.467-09	1.311-09
S	1.657-08	7.134-09	7.218-09	7.518-09	7.532-09	6.079-09	3.887-09	2.544-09	1.593-09	1.354-09
SSW	1.502-08	1.478-08	1.618-08	1.595-08	1.386-08	1.042-08	5.917-09	4.391-09	2.399-09	2.125-09
SW	2.098-08	1.469-08	1.664-08	1.542-08	1.384-08	1.029-08	5.688-09	2.745-09	1.939-09	1.489-09
WSW	3.856-08	1.360-08	1.114-08	1.048-08	9.410-09	6.802-09	4.060-09	2.630-09	1.639-09	1.399-09
W	1.806-08	8.961-09	8.314-09	7.940-09	7.655-09	5.485-09	3.000-09	2.512-09	1.303-09	1.186-09
WNW	1.714-08	6.710-09	9.517-09	9.033-09	8.269-09	6.753-09	3.931-09	2.533-09	1.696-09	1.366-09
NW	1.[illegible]57-08	7.004-09	8.574-09	9.560-09	9.677-09	8.014-09	5.264-09	2.800-09	2.083-09	1.565-09
NNW	1.698-08	1.129-08	1.104-08	1.138-08	1.156-08	8.177-09	4.440-09	2.722-09	1.800-09	1.496-09
ALL	2.285-08	1.284-08	1.305-08	1.350-08	1.280-08	9.450-09	5.287-09	3.366-09	2.159-09	1.764-09

TABLE 2.3-48

X/Q VALUES (sec/meter^3) AT EXCLUSION AREA BOUNDARY FOR

EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	EXCLUSION AREA BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		8-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	.51	3.742-06	1.090-12	3.437-06	3.872-13	1.467-06	1.749-13	1.060-06	8.583-14	6.338-07	7.702-14	3.727-07	3.645-08
NNE	.51	3.861-06	7.831-13	3.526-06	3.135-13	1.714-06	1.315-13	1.043-06	4.555-14	1.125-06	3.254-14	4.167-07	2.772-08
NE	.51	1.448-06	4.399-20	9.135-07	4.899-20	4.630-07	9.781-14	4.644-07	3.581-14	2.076-07	1.938-14	3.039-07	9.296-09
ENE	.51	2.283-06	1.373-12	9.592-07	4.425-13	3.942-07	1.451-13	3.243-07	4.510-14	1.844-07	2.753-14	2.832-07	7.088-09
E	.51	3.174-06	1.784-12	2.402-06	6.190-13	9.502-07	2.067-13	7.170-07	8.362-14	1.902-07	5.253-14	1.531-07	1.694-08
ESE	.51	2.457-06	1.708-12	1.739-06	6.118-13	9.221-07	1.842-13	5.153-07	6.768-14	1.885-07	4.654-14	1.437-07	6.219-09
SE	.51	2.587-07	1.476-12	3.042-07	4.932-13	1.640-07	1.469-13	1.441-07	4.495-14	5.282-08	3.020-14	4.025-08	6.389-14
SSE	.51	1.961-07	1.853-12	1.942-07	6.515-13	6.346-08	1.957-13	6.056-08	6.332-14	3.195-08	3.117-14	3.818-08	4.341-14
S	.51	1.126-06	1.925-12	8.626-07	6.662-13	3.585-07	1.888-13	2.435-07	5.143-14	7.359-08	2.396-14	4.494-08	2.387-14
SSW	.51	9.038-07	2.068-12	6.637-07	7.448-13	3.091-07	1.941-13	2.217-07	4.999-14	6.854-08	2.421-14	2.931-08	2.593-10
SW	.51	2.329-06	2.308-12	1.407-06	8.448-13	5.296-07	2.863-13	3.029-07	8.849-14	1.106-07	2.927-14	3.087-08	2.357-10
WSW	.51	2.501-06	1.832-12	1.824-06	6.264-13	3.960-07	1.827-13	3.279-07	4.962-14	1.780-07	1.995-14	5.807-08	1.441-10
W	.51	3.476-06	5.727-13	2.462-06	3.524-13	8.569-07	1.169-13	4.724-07	3.456-14	1.938-07	1.682-14	1.411-07	1.770-10
WNW	.51	3.534-06	1.137-12	2.025-06	3.642-13	8.928-07	1.036-13	6.292-07	2.965-14	1.667-07	9.749-15	8.197-08	2.536-10
NW	.51	1.311-06	1.040-12	7.939-07	3.672-13	8.168-07	1.268-13	7.205-07	4.229-14	2.944-07	2.535-14	1.247-07	7.655-14
NNW	.51	2.370-06	1.131-12	1.574-06	3.872-13	7.331-07	1.441-13	6.352-07	4.538-14	1.970-07	2.558-14	1.337-07	1.556-09
ALL		2.422-06	1.480-12	1.446-06	5.029-13	6.825-07	1.598-13	5.284-07	4.890-14	1.950-07	2.849-14	1.637-07	5.328-10

TABLE 2.3-49

X/Q VALUES (sec/meter^3) AT ACTUAL SITE BOUNDARY FOR EFFLUENTS

RELEASED THROUGH SGTS VENT

SECTOR	ACTUAL SITE BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		8-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	1.02	1.997-06	2.914-08	1.526-06	1.826-08	8.078-07	9.021-09	3.659-07	3.622-09	2.197-07	2.443-09	8.132-08	1.466-08
NNE	1.33	2.486-06	5.498-08	1.550-06	5.714-08	6.815-07	2.492-08	3.143-07	8.577-09	1.719-07	5.166-09	8.277-08	1.610-08
NE	2.41	1.625-06	2.088-07	1.281-06	1.754-07	5.645-07	8.562-08	1.692-07	2.781-08	7.367-08	1.232-08	3.812-08	1.388-08
ENE	4.45	1.653-06	5.424-07	1.352-06	3.720-07	5.861-07	1.429-07	1.660-07	3.599-08	7.309-08	1.730-08	3.129-08	1.645-08
E	1.97	1.654-06	3.266-07	1.105-06	2.446-07	5.458-07	1.120-07	1.734-07	3.591-08	8.058-08	1.692-08	4.003-08	1.791-08
ESE	.84	1.723-06	6.407-09	1.528-06	4.374-09	7.895-07	1.526-09	[illegible]	4.865-10	1.545-07	2.611-10	7.262-08	9.553-09
SE	.88	1.150-06	9.560-09	7.555-07	7.456-09	2.814-07	2.270-09	1.551-07	7.103-10	6.849-08	3.352-10	5.318-08	5.770-10
SSE	.84	1.001-06	9.456-09	6.791-07	5.269-09	2.336-07	1.772-09	1.129-07	5.244-10	6.577-08	2.044-10	6.225-08	1.986-10
S	.83	1.605-06	8.364-09	1.317-06	4.933-09	4.996-07	1.654-09	2.687-07	4.202-10	7.427-08	1.516-10	2.936-08	1.403-10
SSW	.83	1.719-06	9.242-09	1.430-06	5.544-09	5.528-07	1.879-09	2.410-07	4.146-10	1.048-07	1.626-10	4.235-08	1.689-09
SW	.61	2.082-06	7.881-11	1.495-06	4.735-11	5.743-07	2.093-11	3.873-07	4.657-12	1.097-07	1.880-12	5.765-08	7.541-10
WSW	.51	2.164-06	1.061-12	1.324-06	6.118-13	4.693-07	2.546-13	3.057-07	4.351-14	1.227-07	1.523-14	6.418-08	1.511-10
W	.51	3.250-06	7.499-13	2.304-06	4.593-13	6.463-07	1.762-13	4.416-07	3.389-14	1.718-07	[illegible]	1.572-07	1.769-10
WNW	.63	2.366-06	8.104-11	1.537-06	5.560-11	6.036-07	1.178-11	3.703-07	3.939-12	[illegible]	1.217-12	8.936-08	6.566-10
NW	.73	1.501-06	9.585-10	1.131-06	5.879-10	5.841-07	2.084-10	5.316-07	7.549-11	1.918-07	3.153-11	1.027-07	9.515-11
NNW	.85	1.348-06	6.861-09	9.957-07	3.699-09	4.917-07	1.488-09	2.988-07	4.443-10	1.262-07	1.760-10	5.410-08	3.959-09
ALL		1.651-06	8.321-09	1.293-06	5.682-09	5.616-07	2.870-09	2.437-07	1.082-09	9.500-08	5.929-10	8.378-08	5.433-09

TABLE 2.3-50

X/Q VALUES (sec/meter^3) AT LOW POPULATION ZONE BOUNDARY FOR EFFLUENTS

RELEASED THROUGH SGTS VENT

SECTOR	LPZ BOUNDARY (km)	0-1 HOUR		0-2 HOURS		0-8 HOURS		0-24 HOURS		1-4 DAYS		4-30 DAYS	
		5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT	5 PERCENT	50 PERCENT
N	6.40	1.288-06	3.906-07	9.401-07	2.793-07	4.995-07	1.357-07	1.182-07	3.358-08	5.405-08	1.835-08	2.604-08	1.338-08
NNE	6.40	1.470-06	3.970-07	1.010-06	2.656-07	4.989-07	1.199-07	1.119-07	2.815-08	5.006-08	1.285-08	2.598-08	1.470-08
NE	6.40	1.440-06	3.607-07	9.835-07	2.335-07	5.042-07	1.064-07	1.088-07	2.547-08	4.730-08	1.135-08	2.003-08	1.318-08
ENE	6.40	1.382-06	4.317-07	9.559-07	3.193-07	4.773-07	1.271-07	1.135-07	2.674-08	5.010-08	1.376-08	2.705-08	1.321-08
E	6.40	1.369-06	4.223-07	9.637-07	3.257-07	4.996-07	1.482-07	1.270-07	3.466-08	6.899-08	1.612-08	3.422-08	1.723-08
ESE	6.40	1.206-06	4.161-07	9.517-07	3.301-07	4.837-07	1.538-07	1.357-07	3.657-08	7.170-08	1.628-08	3.881-08	1.457-08
SE	6.40	1.448-06	4.699-07	9.841-07	3.583-07	4.852-07	1.532-07	1.277-07	3.402-08	5.332-08	1.346-08	2.363-08	1.243-08
SSE	6.40	1.532-06	5.474-07	1.162-06	4.285-07	5.763-07	1.817-07	1.417-07	4.187-08	6.348-08	1.402-08	2.149-08	1.120-08
S	6.40	1.951-06	6.389-07	1.266-06	4.587-07	7.176-07	1.752-07	1.918-07	3.335-08	8.420-08	1.169-08	2.874-08	7.690-09
SSW	6.40	2.301-06	7.155-07	1.524-06	5.316-07	7.948-07	2.170-07	2.347-07	4.754-08	1.192-07	1.632-08	4.388-08	7.426-09
SW	6.40	1.690-06	6.457-07	1.218-06	4.608-07	6.120-07	2.026-07	1.707-07	4.830-08	8.473-08	1.696-08	2.893-08	9.201-09
WSW	6.40	1.573-06	5.750-07	1.321-06	3.964-07	6.887-07	1.672-07	1.674-07	3.840-08	6.181-08	1.252-08	2.181-08	1.061-08
W	6.40	1.624-06	4.921-07	1.089-06	3.338-07	5.016-07	1.385-07	1.090-07	3.055-08	4.356-08	1.246-08	1.508-08	7.776-09
WNW	6.40	1.532-06	5.040-07	1.060-06	3.338-07	5.516-07	1.325-07	1.337-07	2.756-08	5.536-08	9.427-09	2.172-08	9.233-09
NW	6.40	1.859-06	4.849-07	1.383-06	3.274-07	7.435-07	1.514-07	1.850-07	3.397-08	6.810-08	1.199-08	2.971-08	9.340-09
NNW	6.40	1.461-06	4.306-07	1.011-06	2.902-07	4.978-07	1.236-07	1.158-07	2.738-08	5.250-08	1.192-08	2.363-08	8.464-09
ALL		1.505-06	4.633-07	1.090-06	3.373-07	5.630-07	1.469-07	1.361-07	3.291-08	6.229-08	1.372-08	2.826-08	1.138-08

TABLE 2.3-51

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

0-1 HOUR FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	2.362-06	1.909-06	1.535-06	1.437-06	1.233-06	7.933-07	4.801-07	3.084-07	2.143-07	1.857-07
NNE	3.055-06	2.170-06	1.706-06	1.673-06	1.390-06	9.543-07	5.489-07	3.227-07	2.173-07	1.878-07
NE	1.505-06	1.903-06	1.659-06	1.618-06	1.299-06	8.743-07	5.385-07	3.224-07	2.472-07	2.042-07
ENE	1.557-06	1.849-06	1.631-06	1.589-06	1.273-06	8.560-07	5.266-07	3.168-07	2.418-07	1.966-07
E	1.733-06	1.812-06	1.556-06	1.576-06	1.333-06	9.129-07	5.156-07	3.216-07	2.511-07	2.041-07
ESE	1.727-06	1.720-06	1.460-06	1.351-06	1.111-06	7.153-07	4.023-07	2.773-07	1.976-07	1.734-07
SE	1.170-06	1.671-06	1.[illegible]40-06	1.620-06	1.337-06	9.290-07	5.552-07	3.337-07	2.622-07	2.175-07
SSE	9.300-07	1.918-06	1.948-06	1.897-06	1.438-06	9.842-07	5.841-07	3.378-07	2.644-07	2.223-07
S	1.641-06	2.238-06	2.552-06	2.211-06	1.773-06	1.163-06	6.473-07	3.951-07	2.958-07	2.335-07
SSW	1.736-06	2.196-06	2.660-06	2.439-06	2.128-06	1.653-06	9.340-07	5.403-07	3.985-07	3.270-07
SW	2.873-06	2.173-06	2.196-06	2.063-06	1.692-06	1.080-06	6.636-07	4.133-07	3.107-07	2.585-07
WSW	1.581-06	2.072-06	1.989-06	1.984-06	1.576-06	1.037-06	6.432-07	3.701-07	2.784-07	2.379-07
W	2.188-06	2.016-06	2.085-06	1.953-06	1.640-06	1.005-06	6.313-07	3.678-07	2.871-07	2.347-07
WNW	1.969-06	2.044-06	1.747-06	[illegible]	1.448-06	9.879-07	6.271-07	4.123-07	3.112-07	2.707-07
NW	1.542-06	2.105-06	275-06	2.114-06	1.746-06	1.173-06	7.235-07	4.471-07	3.235-07	2.842-07
NNW	1.407-06	1.691-06	1.639-06	1.654-06	1.372-06	9.328-07	5.677-07	3.342-07	2.679-07	2.198-07
ALL	1.662-06	1.979-06	1.747-06	1.748-06	1.422-06	9.718-07	5.839-07	3.408-07	2.640-07	2.177-07

TABLE 2.3-52

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

0-2 HOURS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

	DISTANCE FROM THE SITE (mi)									
SECTOR	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.663-06	1.395-06	1.220-06	1.054-06	9.072-07	5.889-07	3.462-07	2.159-07	1.699-07	1.410-07
NNE	2.341-06	1.566-06	1.380-06	1.173-06	9.595-07	6.327-07	3.658-07	2.294-07	1.600-07	1.416-07
NE	1.175-06	1.145-06	1.224-06	1.028-06	9.441-07	6.387-07	3.755-07	2.369-07	1.834-07	1.501-07
ENE	1.174-06	1.127-06	1.188-06	1.060-06	9.193-07	6.137-07	3.591-07	2.191-07	1.689-07	1.386-07
E	1.528-06	1.133-06	1.119-06	1.029-06	9.225-07	6.148-07	3.631-07	2.243-07	1.742-07	1.458-07
ESE	1.568-06	1.125-06	1.152-06	1.053-06	9.033-07	5.658-07	3.365-07	2.112-07	1.570-07	1.322-07
SE	6.673-07	1.094-06	1.181-06	1.072-06	9.281-07	6.307-07	3.805-07	2.416-07	1.671-07	1.580-07
SSE	6.780-07	1.138-06	1.352-06	1.264-06	1.125-06	7.041-07	3.975-07	2.420-07	1.993-07	1.658-07
S	1.397-06	1.760-06	1.663-06	1.371-06	1.268-06	7.760-07	4.01[illegible]-07	2.4[illegible]0-07	1.871-07	1.607-07
SSW	1.406-06	1.828-06	1.811-06	1.622-06	1.662-06	1.048-06	5.749-07	3.590-07	2.959-07	2.360-07
SW	1.629-06	1.763-06	1.547-06	1.305-06	1.239-06	7.787-07	4.082-07	2.753-07	1.956-07	1.673-07
WSW	1.366-06	1.618-06	1.632-06	1.412-06	1.263-06	8.177-07	3.992-07	2.453-07	1.822-07	1.497-07
W	1.528-06	1.284-06	1.360-06	1.217-06	1.068-06	7.454-07	4.089-07	2.674-07	1.937-07	1.747-07
WNW	1.415-06	1.279-06	1.314-06	[illegible]	9.868-07	6.685-07	4.042-07	2.804-07	[illegible]	1.806-07
NW	1.163-06	1.563-06	1.709-06	1.511-06	1.348-06	9.390-07	4.819-07	3.196-07	2.544-07	2.082-07
NNW	1.097-06	1.090-06	1.214-06	1.121-06	9.475-07	6.443-07	3.890-07	2.584-07	1.907-07	1.683-07
ALL	1.378-06	1.327-06	1.350-06	1.198-06	1.055-06	6.704-07	3.868-07	2.407-07	1.873-07	1.568-07

TABLE 2.3-53

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-8 HOURS FOR EFFLUENTS

RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.032-06	6.576-07	6.414-07	5.376-07	4.754-07	3.147-07	2.085-07	1.234-07	9.294-08	6.919-08
NNE	1.198-06	7.287-07	6.626-07	5.431-07	4.758-07	3.093-07	2.044-07	1.200-07	9.269-08	6.870-08
NE	5.910-07	5.536-07	5.664-07	5.387-07	4.764-07	3.133-07	2.192-07	1.354-07	1.070-07	8.188-08
ENE	5.700-07	5.392-07	5.510-07	5.077-07	4.565-07	3.055-07	1.863-07	1.100-07	7.827-08	6.358-08
E	6.470-07	5.678-07	6.334-07	5.349-07	4.805-07	3.049-07	2.018-07	1.224-07	8.867-08	6.755-08
ESE	8.605-07	5.582-07	6.089-07	5.[illegible]73-07	4.812-07	3.053-07	2.108-07	1.269-07	9.758-08	7.024-08
SE	2.789-07	5.435-07	5.615-07	4.934-07	4.617-07	3.095-07	2.155-07	1.335-07	1.030-07	8.070-08
SSE	2.332-07	5.719-07	6.826-07	5.946-07	5.317-07	3.439-07	2.361-07	1.496-07	1.193-07	9.354-08
S	5.670-07	8.926-07	9.462-07	7.895-07	6.847-07	4.103-07	2.484-07	1.417-07	1.052-07	7.842-08
SSW	6.146-07	9.614-07	9.536-07	8.279-07	7.622-07	5.066-07	2.797-07	2.013-07	1.471-07	1.151-07
SW	6.886-07	7.989-07	7.582-07	6.546-07	5.792-07	4.092-07	2.517-07	1.413-07	1.040-07	7.308-08
WSW	5.741-07	8.006-07	8.330-07	7.432-07	6.606-07	4.090-07	2.476-07	1.401-07	9.948-08	6.959-08
W	6.249-07	5.482-07	5.927-07	5.248-07	4.720-07	3.248-07	2.243-07	1.399-07	1.097-07	8.595-08
WNW	5.296-07	5.890-07	6.730-07	5.794-07	5.274-07	3.478-07	2.310-07	1.372-07	1.100-07	7.9[illegible]1-08
NW	6.825-07	8.308-07	8.989-07	7.[illegible]72-07	7.071-07	4.635-07	2.654-07	1.504-07	1.217-07	9.739-08
NNW	5.678-07	5.188-07	5.770-07	5.297-07	4.932-07	3.207-07	2.088-07	1.284-07	9.740-08	7.452-08
ALL	6.317-07	6.229-07	6.781-07	5.891-07	5.219-07	3.406-07	2.272-07	1.346-07	1.030-07	7.714-08

TABLE 2.3-54

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 8-24 HOURS FOR EFFLUENTS

RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	5.249-07	2.154-07	1.678-07	1.379-07	1.118-07	6.487-08	3.379-08	1.847-08	1.283-08	8.764-09
NNE	5.446-07	2.157-07	1.653-07	1.315-07	1.033-07	6.111-08	3.286-08	1.746-08	1.107-08	8.055-09
NE	3.391-07	1.812-07	1.393-07	1.205-07	1.018-07	6.188-08	3.214-08	1.633-08	1.295-08	9.274-09
ENE	2.794-07	1.742-07	1.478-07	1.292-07	1.087-07	6.390-08	3.302-08	1.752-08	1.105-08	7.855-09
E	3.905-07	2.039-07	1.735-07	1.443-07	1.159-07	6.839-08	3.360-08	1.674-08	1.284-08	8.431-09
ESE	4.355-07	2.132-07	1.680-07	1.505-07	1.226-07	7.204-08	3.469-08	1.922-08	1.333-08	9.154-09
SE	1.478-07	1.868-07	1.697-07	1.436-07	1.175-07	6.859-08	3.383-08	1.873-08	1.273-08	9.329-09
SSE	1.104-07	2.133-07	1.976-07	1.603-07	1.279-07	7.862-08	3.504-08	1.979-08	1.427-08	9.889-09
S	3.059-07	2.319-07	2.613-07	2.219-07	1.757-07	9.767-08	4.828-08	2.139-08	1.523-08	1.044-08
SSW	2.462-07	2.810-07	2.985-07	2.696-07	2.176-07	1.196-07	6.530-08	3.246-08	2.279-08	1.539-08
SW	3.972-07	2.451-07	2.289-07	1.953-07	1.559-07	9.069-08	5.143-08	2.199-08	1.527-08	1.024-08
WSW	3.700-07	2.352-07	2.168-07	1.970-07	1.642-07	9.522-08	4.471-08	2.217-08	1.490-08	1.009-08
W	3.514-07	1.876-07	1.466-07	1.206-07	9.943-08	6.353-08	3.333-08	1.846-08	1.297-08	9.370-09
WNW	3.327-07	2.094-07	1.869-07	1.557-07	1.241-07	7.040-08	3.479-08	1.950-08	1.407-08	9.467-09
NW	4.206-07	2.257-07	2.366-07	2.022-07	1.656-07	9.959-08	5.020-08	2.979-08	1.906-08	1.319-08
NNW	3.380-07	1.683-07	1.493-07	1.299-07	1.096-07	6.496-08	3.285-08	1.819-08	1.272-08	8.830-09
ALL	3.725-07	2.136-07	1.874-07	1.543-07	1.240-07	7.442-08	3.510-08	1.964-08	1.377-08	9.470-09

TABLE 2.3-55

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 1-4 DAYS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	3.102-07	9.516-08	7.307-08	6.318-08	4.932-08	2.988-08	1.702-08	9.173-09	6.321-09	4.322-09
NNE	3.630-07	1.011-07	6.702-08	5.770-08	4.416-08	2.769-08	1.616-08	7.645-09	5.631-09	3.884-09
NE	1.336-07	6.191-08	6.287-08	5.360-08	4.456-08	2.822-08	1.640-08	8.940-09	6.406-09	4.441-09
ENE	1.153-07	6.221-08	6.772-08	5.732-08	4.800-08	2.845-08	1.563-08	7.444-09	5.004-09	3.733-09
E	1.284-07	9.054-08	8.426-08	7.535-08	6.276-08	3.831-08	1.970-08	1.042-08	7.087-09	5.329-09
ESE	1.707-07	9.813-08	8.515-08	7.756-08	6.542-08	4.219-08	2.048-08	1.116-08	7.652-09	5.614-09
SE	6.332-08	8.131-08	7.955-08	6.336-08	4.887-08	2.912-08	1.721-08	7.476-09	5.584-09	4.069-09
SSE	5.338-08	9.495-08	8.219-08	7.145-08	6.028-08	3.675-08	1.886-08	9.387-09	6.426-09	4.443-09
S	9.258-08	9.737-08	1.002-07	8.231-08	8.277-08	5.295-08	2.622-08	1.439-08	9.943-09	6.710-09
SSW	9.160-08	1.233-07	1.410-07	1.250-07	1.085-07	6.347-08	3.425-08	1.717-08	1.177-08	8.055-09
SW	1.335-07	1.190-07	1.094-07	9.381-08	8.138-08	4.923-08	2.236-08	1.431-08	9.854-09	6.789-09
WSW	1.513-07	9.471-08	7.865-08	7.186-08	5.638-08	3.409-08	1.913-08	9.664-09	6.176-09	4.110-09
W	1.401-07	6.640-08	5.814-08	4.979-08	4.059-08	2.370-08	1.351-08	6.660-09	4.614-09	3.582-09
WNW	8.066-08	7.181-08	6.950-08	[illegible]	5.089-08	2.921-08	1.688-08	8.116-09	4.823-09	3.734-09
NW	1.717-07	8.369-08	7.544-08	7.362-08	6.309-08	3.941-08	2.133-08	1.182-08	9.051-09	6.137-09
NNW	1.168-07	6.130-08	6.671-08	6.020-08	4.975-08	2.938-08	1.576-08	7.660-09	5.110-09	3.772-09
ALL	1.350-07	9.054-08	7.845-08	7.033-08	5.869-08	3.454-08	1.885-08	9.682-09	6.766-09	4.578-09

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TABLE 2.3-56

FIFTH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 4-30 DAYS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.311-07	3.097-08	3.368-08	3.066-08	2.533-08	1.621-08	8.458-09	4.169-09	3.339-09	2.369-09
NNE	2.728-07	5.353-08	3.303-08	2.724-08	2.413-08	1.722-08	1.245-08	5.178-09	3.606-09	3.194-09
NE	1.331-07	4.440-08	2.747-08	2.447-08	2.030-08	1.298-08	7.184-09	3.786-09	3.090-09	2.141-09
ENE	8.938-08	3.015-08	3.246-08	3.126-08	2.753-08	1.719-08	1.010-08	4.638-09	3.335-09	2.697-09
E	5.284-08	5.387-08	4.204-08	3.658-08	3.068-08	1.986-08	1.614-08	5.233-09	3.673-09	3.225-09
ESE	1.029-07	5.117-08	4.989-08	4.616-08	3.825-08	2.371-08	1.606-08	6.098-09	4.773-09	3.254-09
SE	4.722-08	3.168-08	3.210-08	2.707-08	2.231-08	1.389-08	7.220-09	3.528-09	2.319-09	2.101-09
SSE	6.956-08	2.988-08	2.723-08	2.452-08	2.036-08	1.264-08	7.009-09	3.246-09	2.239-09	1.765-09
S	5.140-08	2.835-08	3.290-08	3.061-08	2.980-08	1.886-08	1.378-08	5.407-09	3.255-09	2.844-09
SSW	5.262-08	5.513-08	5.062-08	4.711-08	4.004-08	2.559-08	1.462-08	7.214-09	4.389-09	2.875-09
SW	5.564-08	5.473-08	3.816-08	3.613-08	2.887-08	1.651-08	1.057-08	4.522-09	3.440-09	3.030-09
WSW	8.488-08	3.091-08	2.642-08	2.490-08	2.103-08	1.315-08	9.097-09	4.686-09	2.948-09	2.440-09
W	1.032-07	2.739-08	2.132-08	1.788-08	1.479-08	9.357-09	6.727-09	2.551-09	2.038-09	1.583-09
WNW	5.720-08	2.613-08	2.635-08	2.439-08	2.012-08	1.294-08	6.946-09	3.415-09	2.312-09	1.904-09
NW	7.914-08	4.736-08	4.098-08	3.517-08	2.986-08	1.971-08	1.401-08	5.131-09	3.541-09	3.010-09
NNW	7.902-08	3.020-08	3.195-08	2.568-08	2.140-08	1.355-08	7.151-09	3.660-09	2.695-09	2.070-09
ALL	1.034-07	4.207-08	3.493-08	3.189-08	2.750-08	1.739-08	1.117-08	4.812-09	3.394-09	2.730-09

TABLE 2.3-57

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-1 HOUR FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	3.098-09	2.763-07	4.317-07	4.125-07	3.675-07	2.522-07	1.410-07	9.069-08	6.394-08	5.102-08
NNE	2.874-09	2.669-07	4.325-07	4.063-07	3.748-07	2.584-07	1.486-07	9.507-08	6.759-08	5.487-08
NE	1.585-12	2.331-07	4.008-07	3.742-07	3.453-07	2.409-07	1.570-07	1.031-07	8.169-08	6.627-08
ENE	3.599-09	3.494-07	5.049-07	4.732-07	4.020-07	2.791-07	1.577-07	9.022-08	7.027-08	5.446-08
E	4.196-09	4.128-07	5.148-07	4.579-07	3.862-07	2.553-07	1.415-07	8.418-08	5.720-08	4.352-08
ESE	4.048-09	3.957-07	5.052-07	4.621-07	3.916-07	2.629-07	1.427-07	8.176-08	5.678-08	4.236-08
SE	3.696-09	4.148-07	5.514-07	5.150-07	4.340-07	2.685-07	1.648-07	9.533-08	6.562-08	5.166-08
SSE	4.401-09	5.693-07	6.688-07	6.034-07	5.019-07	3.227-07	1.659-07	9.347-08	5.988-08	4.556-08
S	4.955-09	7.001-07	7.468-07	6.775-07	5.704-07	3.842-07	1.923-07	1.110-07	7.382-08	5.617-08
SSW	5.210-09	7.913-07	8.629-07	7.430-07	6.496-07	4.198-07	2.088-07	1.116-07	6.972-08	5.077-08
SW	5.404-09	6.951-07	7.637-07	6.672-07	5.785-07	3.759-07	1.776-07	9.193-08	5.815-08	4.282-08
WSW	4.662-09	4.936-07	6.419-07	6.029-07	5.353-07	3.663-07	1.898-07	1.115-07	7.611-08	5.586-08
W	2.992-09	2.942-07	5.252-07	5.060-07	4.570-07	3.239-07	1.924-07	1.227-07	8.748-08	6.822-08
WNW	3.286-09	3.572-07	5.732-07	5.379-07	4.599-07	3.337-07	1.951-07	1.213-07	8.589-08	6.596-08
NW	3.209-09	3.947-07	5.492-07	5.144-07	4.462-07	3.136-07	1.810-07	1.114-07	8.075-08	6.375-08
NNW	3.213-09	2.963-07	4.793-07	4.566-07	4.053-07	2.716-07	1.482-07	9.420-08	6.854-08	5.562-08
ALL	3.820-09	4.011-07	5.423-07	5.015-07	4.273-07	2.909-07	1.618-07	9.716-08	6.754-08	5.289-08

TABLE 2.3-58

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

0-2 HOURS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.734-09	2.093-07	3.127-07	3.048-07	2.642-07	1.829-07	1.077-07	5.856-08	4.671-08	3.710-08
NNE	1.424-09	1.939-07	2.980-07	2.844-07	2.577-07	1.779-07	1.073-07	6.850-08	4.886-08	4.018-08
NE	1.388-12	1.791-07	2.664-07	2.495-07	2.217-07	1.676-07	1.084-07	6.937-08	4.960-08	4.274-08
ENE	2.140-09	2.630-07	3.781-07	3.407-07	2.941-07	1.941-07	1.065-07	6.438-08	4.513-08	3.576-08
E	2.901-09	3.051-07	3.875-07	3.485-07	2.944-07	1.948-07	1.047-07	6.051-08	4.198-08	3.054-08
ESE	2.627-09	3.065-07	3.915-07	3.553-07	3.049-07	2.014-07	1.101-07	6.155-08	4.257-08	3.110-08
SE	2.262-09	3.074-07	4.168-07	3.980-07	3.355-07	2.208-07	1.230-07	7.133-08	4.714-08	3.671-08
SSE	3.271-09	4.167-07	5.119-07	4.621-07	3.938-07	2.531-07	1.288-07	7.297-08	4.769-08	3.603-08
S	3.795-09	4.609-07	5.262-07	4.920-07	4.258-07	2.757-07	1.378-07	8.058-08	5.394-08	4.060-08
SSW	4.448-09	5.364-07	6.376-07	5.604-07	4.846-07	3.111-07	1.524-07	8.357-08	5.420-08	3.934-08
SW	4.525-09	4.907-07	5.585-07	5.036-07	4.315-07	2.766-07	1.325-07	7.293-08	4.668-08	3.436-08
WSW	3.363-09	3.438-07	4.537-07	4.383-07	3.801-07	2.523-07	1.304-07	7.601-08	4.960-08	3.846-08
W	1.738-09	2.430-07	3.783-07	3.658-07	3.155-07	2.296-07	1.347-07	8.362-08	5.772-08	4.491-08
WNW	1.903-09	2.482-07	3.856-07	3.515-07	3.135-07	2.243-07	1.298-07	7.916-08	5.594-08	4.378-08
NW	1.817-09	2.714-07	3.906-07	3.607-07	3.092-07	2.178-07	1.306-07	8.072-08	5.773-08	4.516-08
NNW	1.748-09	2.264-07	3.330-07	3.040-07	2.728-07	1.914-07	1.122-07	6.951-08	4.825-08	3.748-08
ALL	2.484-09	2.871-07	3.937-07	3.653-07	3.134-07	2.115-07	1.179-07	7.064-08	4.797-08	3.762-08

TABLE 2.3-59

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 0-8 HOURS FOR EFFLUENTS

RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	9.779-10	1.117-07	1.519-07	1.424-07	1.294-07	9.177-08	5.441-08	3.375-08	2.425-08	1.893-08
NNE	7.482-10	9.428-08	1.308-07	1.237-07	1.117-07	8.258-08	5.125-08	3.101-08	2.314-08	1.823-08
NE	6.374-10	8.560-08	1.185-07	1.134-07	1.022-07	7.548-08	4.626-08	2.820-08	2.089-08	1.624-08
ENE	8.580-10	1.142-07	1.455-07	1.336-07	1.179-07	8.042-08	4.836-08	2.901-08	2.081-08	1.618-08
E	1.119-09	1.371-07	1.703-07	1.548-07	1.351-07	9.190-08	5.280-08	3.091-08	2.177-08	1.598-08
ESE	1.011-09	1.328-07	1.770-07	1.630-07	1.425-07	9.638-08	5.379-08	3.109-08	2.217-08	1.658-08
SE	8.849-10	1.246-07	1.742-07	1.610-07	1.440-07	9.859-08	5.719-08	3.294-08	2.377-08	1.762-08
SSE	1.111-09	1.779-07	2.202-07	1.960-07	1.673-07	1.109-07	6.149-08	3.556-08	2.413-08	1.821-08
S	1.089-09	1.783-07	1.954-07	1.805-07	1.614-07	1.114-07	6.131-08	3.523-08	2.465-08	1.906-08
SSW	1.[illegible]6-09	2.143-07	2.654-07	2.330-07	2.017-07	1.302-07	6.836-08	3.924-08	2.671-08	1.992-08
SW	1.451-09	2.274-07	2.515-07	2.203-07	1.805-07	1.238-07	6.420-08	3.281-08	2.301-08	1.705-08
WSW	1.052-09	1.484-07	1.936-07	1.780-07	1.560-07	1.036-07	5.716-08	3.249-08	2.269-08	1.657-08
W	[illegible].639-10	1.067-07	1.464-07	1.414-07	1.273-07	9.498-08	5.581-08	3.248-08	2.428-08	1.745-08
WNW	6.798-10	9.290-08	1.421-07	1.385-07	1.231-07	9.327-08	5.836-08	3.548-08	2.540-08	1.952-08
NW	8.016-10	1.207-07	1.704-07	1.543-07	1.430-07	9.935-08	6.166-08	3.874-08	2.871-08	2.211-08
NNW	8.204-10	1.045-07	1.400-07	1.284-07	1.168-07	8.259-08	5.092-08	3.058-08	2.258-08	1.736-08
ALL	9.321-10	1.253-07	1.651-07	1.529-07	1.356-07	9.446-08	5.512-08	3.228-08	2.332-08	1.763-08

TABLE 2.3-60

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 8-24 HOURS FOR EFFLUENTS

RELEASED THROUGH SGTS VENTS

SECTOR	DISTANCE FROM THE SITE (mi)									
	0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	3.455-10	3.853-08	4.122-08	3.664-08	3.067-08	1.959-08	9.763-09	5.306-09	3.508-09	2.675-09
NNE	2.490-10	2.931-08	3.350-08	3.035-08	2.542-08	1.647-08	8.258-09	4.575-09	3.271-09	2.429-09
NE	2.218-10	2.842-08	3.096-08	2.757-08	2.359-08	1.506-08	7.501-09	4.128-09	2.850-09	2.137-09
ENE	2.654-10	3.221-08	3.520-08	3.337-08	2.534-08	1.571-08	7.734-09	4.380-09	3.089-09	2.272-09
E	3.527-10	4.375-08	4.393-08	3.816-08	3.108-08	1.976-08	9.366-09	5.121-09	3.473-09	2.537-09
ESE	3.229-10	4.034-08	4.382-08	3.913-08	3.304-08	2.069-08	9.572-09	5.150-09	3.377-09	2.421-09
SE	2.698-10	3.506-08	4.145-08	3.694-08	3.100-08	1.914-08	9.032-09	5.056-09	3.304-09	2.471-09
SSE	3.203-10	4.734-08	5.155-08	4.572-08	3.848-08	2.257-08	1.080-08	5.841-09	3.824-09	2.825-09
S	3.101-10	4.677-08	4.375-08	3.686-08	3.093-08	1.941-08	9.528-09	5.080-09	3.360-09	2.526-09
SSW	3.402-10	5.675-08	6.384-08	5.352-08	4.440-08	2.609-08	1.219-08	6.403-09	4.314-09	3.030-09
SW	4.033-10	6.466-08	6.673-08	5.459-08	4.530-08	2.698-08	1.235-08	6.051-09	3.921-09	2.782-09
WSW	3.076-10	4.409-08	4.676-08	4.115-08	3.493-08	2.150-08	1.005-08	5.203-09	3.544-09	2.562-09
W	2.314-10	2.943-08	3.554-08	3.366-08	2.833-08	1.793-08	9.070-09	4.790-09	3.434-09	2.596-09
WNW	1.582-10	2.468-08	3.136-08	3.026-08	2.553-08	1.678-08	8.928-09	5.315-09	3.686-09	2.697-09
NW	2.631-10	3.651-08	4.203-08	3.663-08	3.093-08	2.008-08	1.015-08	5.745-09	4.049-09	2.986-09
NNW	2.634-10	3.119-08	3.476-08	3.030-08	2.515-08	1.632-08	8.287-09	4.718-09	3.258-09	2.453-09
ALL	2.890-10	3.785-08	4.065-08	3.607-08	2.589-08	1.888-08	9.042-09	5.022-09	3.410-09	2.528-09

TABLE 2.3-61

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF

1-4 DAYS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	2.145-10	2.065-08	2.058-08	1.749-08	1.485-08	9.230-09	4.576-09	2.558-09	1.759-09	1.283-09
NNE	1.575-10	1.492-08	1.606-08	1.397-08	1.199-08	7.720-09	3.997-09	2.261-09	1.546-09	1.160-09
NE	8.610-11	1.300-08	1.409-08	1.226-08	1.022-08	6.211-09	3.226-09	1.890-09	1.271-09	9.141-10
ENE	1.236-10	1.665-08	1.640-08	1.469-08	1.232-08	7.775-09	3.650-09	1.989-09	1.339-09	1.004-09
E	1.848-10	2.066-08	2.114-08	1.743-08	1.452-08	8.907-09	4.630-09	2.373-09	1.636-09	[illegible]
ESE	1.619-10	1.989-08	2.105-08	1.761-08	1.437-08	8.805-09	4.398-09	2.360-09	1.620-09	1.175-09
SE	1.207-10	1.456-08	1.651-08	1.506-08	1.194-08	7.947-09	4.041-09	2.273-09	1.532-09	1.128-09
SSE	1.305-10	1.642-08	1.753-08	1.590-08	1.282-08	7.815-09	3.758-09	1.988-09	1.363-09	9.483-10
S	1.117-10	1.486-08	1.555-08	1.302-08	1.040-08	6.719-09	3.125-09	1.722-09	1.132-09	8.520-10
SSW	1.277-10	1.836-08	2.107-08	1.814-08	1.506-08	8.825-09	4.193-09	2.190-09	1.447-09	1.026-09
SW	1.548-10	2.226-08	2.231-08	1.916-08	1.557-08	9.084-09	4.124-09	2.224-09	1.483-09	9.773-10
WSW	8.952-11	1.387-08	1.584-08	1.365-08	1.130-08	7.280-09	3.725-09	1.962-09	1.210-09	8.873-10
W	8.178-11	1.160-08	1.461-08	1.352-08	1.163-08	7.165-09	3.609-09	2.081-09	1.403-09	1.009-09
WNW	6.601-11	7.965-09	1.103-08	[illegible]	9.296-09	5.849-09	2.806-09	1.762-09	1.224-09	8.965-10
NW	1.152-10	1.458-08	1.502-08	1.306-08	1.100-08	7.354-09	3.622-09	2.043-09	1.405-09	1.059-09
NNW	1.028-10	1.354-08	1.512-08	[illegible]	1.060-08	6.562-09	3.333-09	1.889-09	1.304-09	9.193-10
ALL	1.308-10	1.566-08	1.748-08	[illegible]	1.246-08	7.808-09	3.856-09	2.125-09	1.434-09	1.043-09

TABLE 2.3-62

FIFTIETH PERCENTILE X/Q VALUES (sec/meter^3) FOR THE TIME PERIOD OF 4-30 DAYS FOR EFFLUENTS RELEASED THROUGH SGTS VENT

SECTOR	DISTANCE FROM THE SITE (mi) 0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	1.854-08	1.877-08	1.721-08	1.487-08	1.235-08	7.657-09	4.132-09	2.092-09	1.435-09	1.09[illegible]-09
NNE	2.026-08	2.103-08	1.867-08	1.550-08	1.275-08	8.129-09	4.626-09	2.260-09	1.618-09	1.146-09
NE	1.188-08	1.435-08	1.598-08	1.433-08	1.212-08	7.848-09	4.224-09	2.165-09	1.559-09	1.127-09
ENE	1.133-08	1.594-08	1.697-08	1.459-08	1.196-08	7.310-09	3.610-09	1.892-09	1.330-09	9.[illegible]-10
E	1.141-08	2.281-08	2.156-08	1.864-08	1.545-08	9.537-09	4.888-09	2.547-09	1.661-09	1.327-09
ESE	1.171-08	1.819-08	1.811-08	1.556-08	1.318-08	8.482-09	4.234-09	2.147-09	1.433-09	9.560-10
SE	2.163-10	1.740-08	1.647-08	1.349-08	1.124-08	5.923-09	3.330-09	1.656-09	1.282-09	8.952-10
SSE	1.848-10	1.296-08	1.501-08	1.252-08	1.014-08	6.216-09	2.774-09	1.54[illegible]-09	1.005-09	7.603-10
S	1.104-10	1.032-08	1.081-08	9.222-09	7.581-09	4.535-09	2.239-09	9.363-10	6.490-10	4.615-10
SSW	2.394-09	1.253-08	1.035-08	8.485-09	7.033-09	4.216-09	2.052-09	9.125-10	7.343-10	5.235-10
SW	1.967-09	1.141-08	1.261-08	1.055-08	8.937-09	5.439-09	2.461-09	1.282-09	8.261-10	6.479-10
WSW	6.935-10	9.999-09	1.387-08	1.113-08	9.155-09	5.847-09	2.426-09	1.478-09	9.106-10	6.456-10
W	1.029-09	9.616-09	1.032-08	6.763-09	7.267-09	4.600-09	2.198-09	1.155-09	7.924-10	5.883-10
WNW	1.608-09	9.86[illegible]-09	1.220-08	1.007-08	8.475-09	5.105-09	2.487-09	1.448-09	9.823-10	7.042-10
NW	5.268-10	1.135-08	1.159-08	1.031-08	8.666-09	5.395-09	2.750-09	1.430-09	1.025-09	7.279-10
NNW	4.716-09	1.060-08	1.081-08	9.437-09	7.602-09	4.910-09	2.342-09	1.329-09	8.697-10	6.932-10
ALL	2.643-09	1.394-08	1.484-08	1.250-08	1.036-08	6.417-09	2.978-09	1.652-09	1.130-09	8.311-10

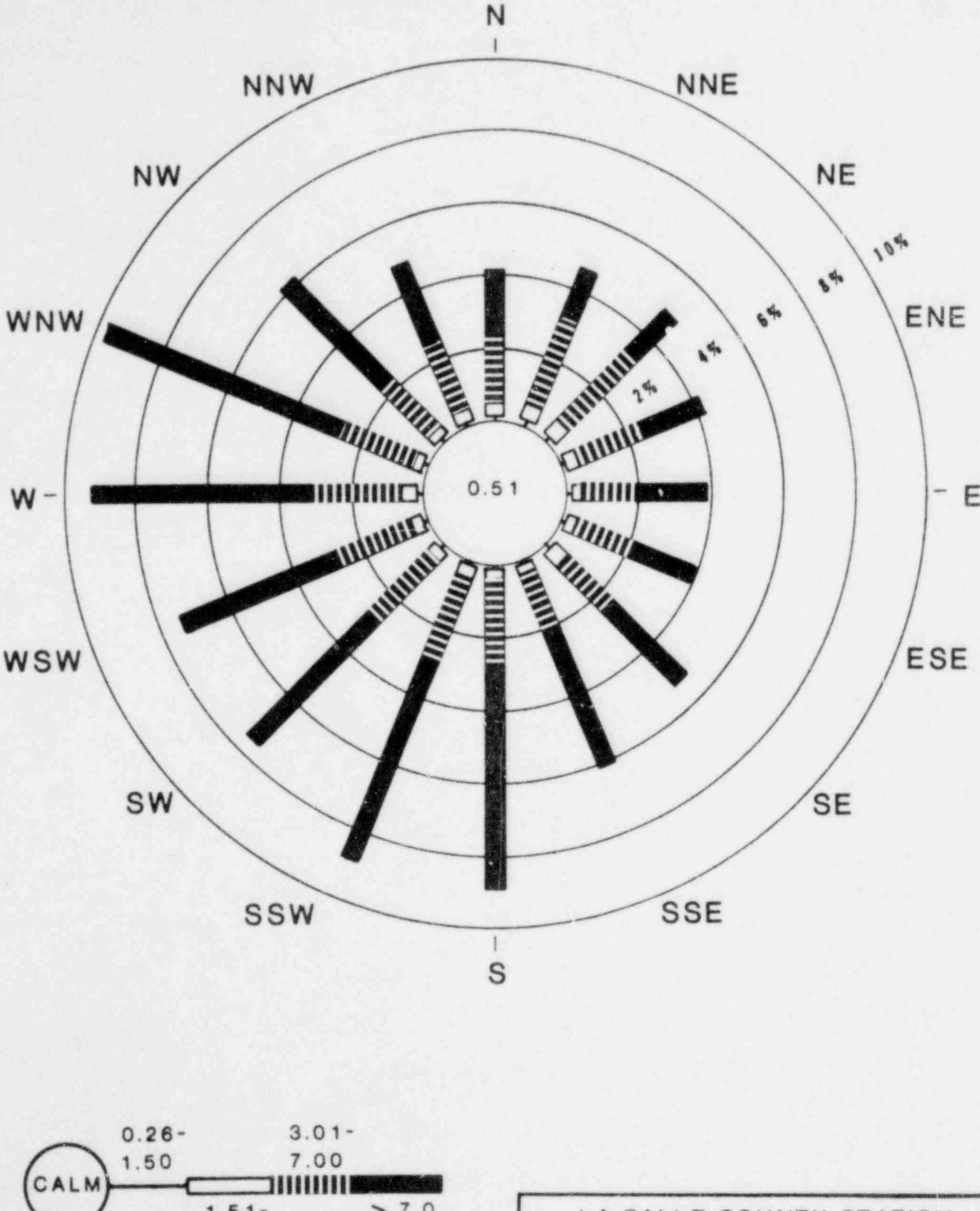
TABLE 2.3-63

ANNUAL AVERAGE X/Q VALUES (sec/meter^3)

FOR EFFLUENTS RELEASED FROM PLANT COMMON STACK AND SGTS VENT*

SECTOR	SITE BOUNDARY	DISTANCE FROM THE SITE (mi)									
		0.5	1.5	2.5	3.5	4.5	7.5	15.0	25.0	35.0	45.0
N	16.4	18.4	25.0	23.8	19.9	16.5	10.4	5.01	2.82	1.91	1.43
NNE	16.4	16.1	23.7	23.2	19.7	16.5	10.7	5.29	3.02	2.07	1.55
NE	24.0	15.6	24.0	22.0	18.1	15.0	9.4	4.52	2.56	1.76	1.32
ENE	23.7	15.0	26.1	24.8	20.6	17.0	10.5	4.88	2.69	1.80	1.33
E	30.7	17.6	32.8	30.2	24.5	19.9	12.1	5.54	3.02	2.02	1.49
ESE	18.0	18.1	31.3	29.1	24.5	20.1	12.3	5.62	3.04	2.01	1.47
SE	11.5	11.3	21.8	20.2	16.5	13.5	8.3	3.84	2.11	1.42	1.05
SSE	7.1	7.0	21.6	20.9	17.2	14.1	8.6	3.92	2.12	1.41	1.03
S	16.0	16.1	22.4	20.0	15.1	12.8	7.5	3.27	1.72	1.12	0.81
SSW	14.1	14.0	27.2	25.6	19.9	17.1	10.2	4.53	2.38	1.55	1.12
SW	17.3	16.9	24.7	22.3	17.1	14.6	8.8	3.95	2.11	1.39	1.01
WSW	15.9	12.1	19.6	18.1	13.8	11.8	7.0	3.06	1.60	1.03	0.75
W	17.5	11.5	15.3	14.6	11.6	10.1	6.4	3.06	1.69	1.14	0.84
WNW	12.4	8.9	13.7	13.0	10.3	9.0	5.6	2.72	1.53	1.03	0.77
NW	8.2	8.0	20.8	20.3	16.2	14.1	8.8	4.23	2.36	1.59	1.18
NNW	11.6	12.3	18.0	17.5	14.1	12.3	7.8	3.83	2.19	1.50	1.13

* X/Q values are multiplied by 10^{-9}, i.e. 16.4 implies X/Q = 1.64×10^{-8} (sec/m^3).



NOTE:
ANNUAL VALUES BASED ON
DATA COLLECTED OCTOBER 1,1976
THROUGH SEPTEMBER 30,1978

LA SALLE COUNTY STATION
FINAL SAFETY ANALYSIS REPORT

FIGURE 2.3-2

ANNUAL WIND ROSE 375-FOOT LEVEL

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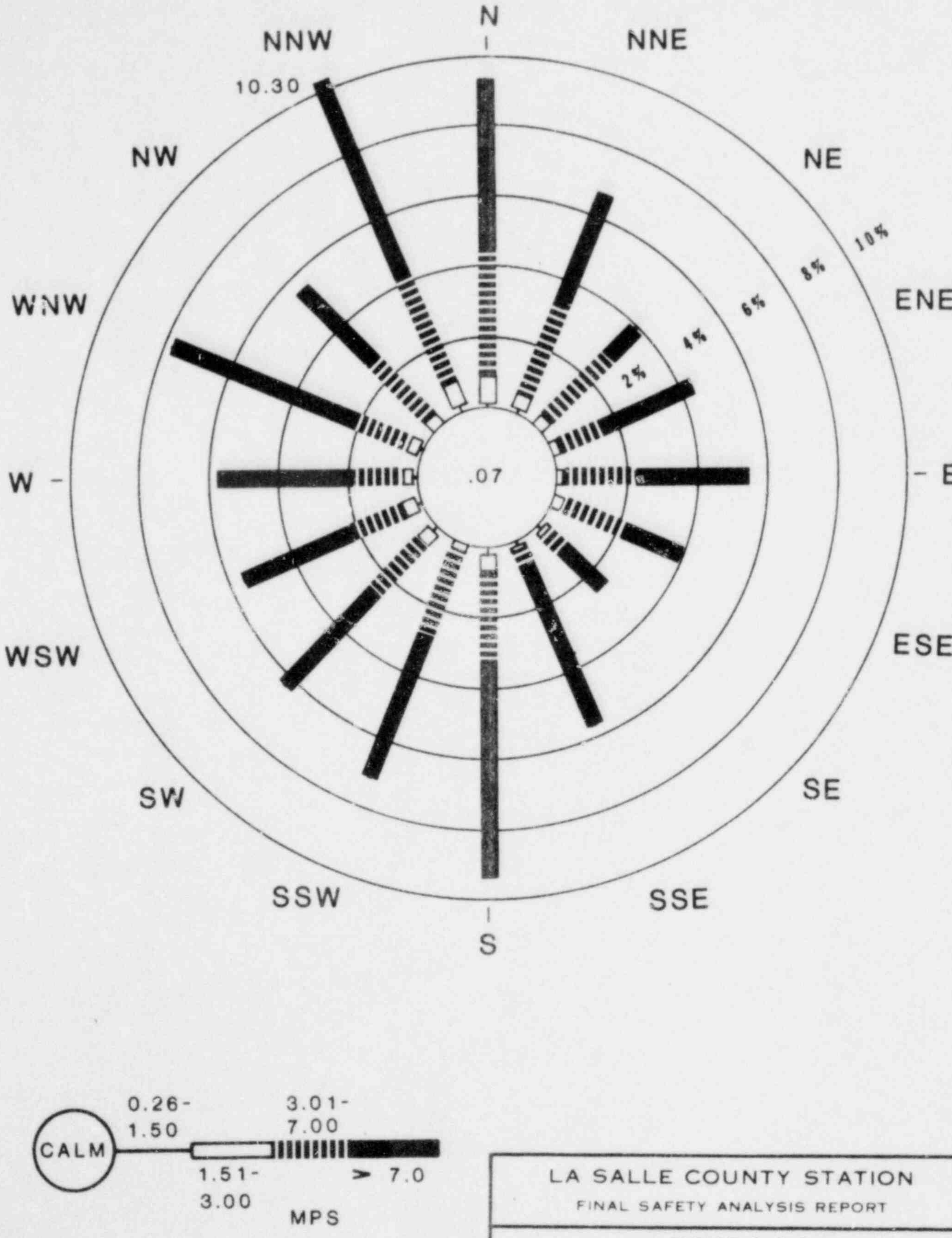

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FIGURE 2.3-3

OCTOBER 1976 AND OCTOBER 1977
WIND ROSE 375-FOOT LEVEL

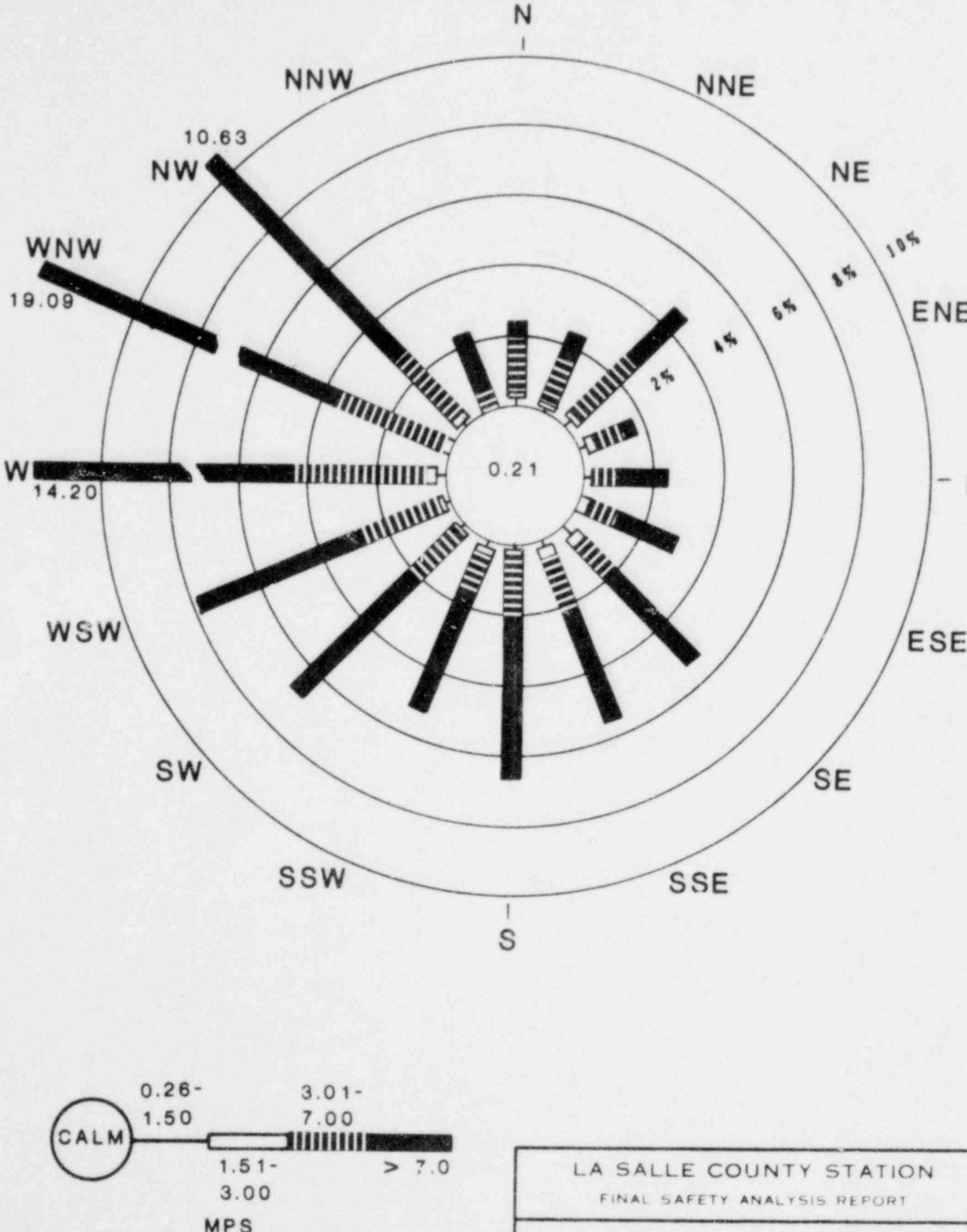

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FIGURE 2.3-4

NOVEMBER 1976 AND NOVEMBER 1977
WIND ROSE 375-FOOT LEVEL

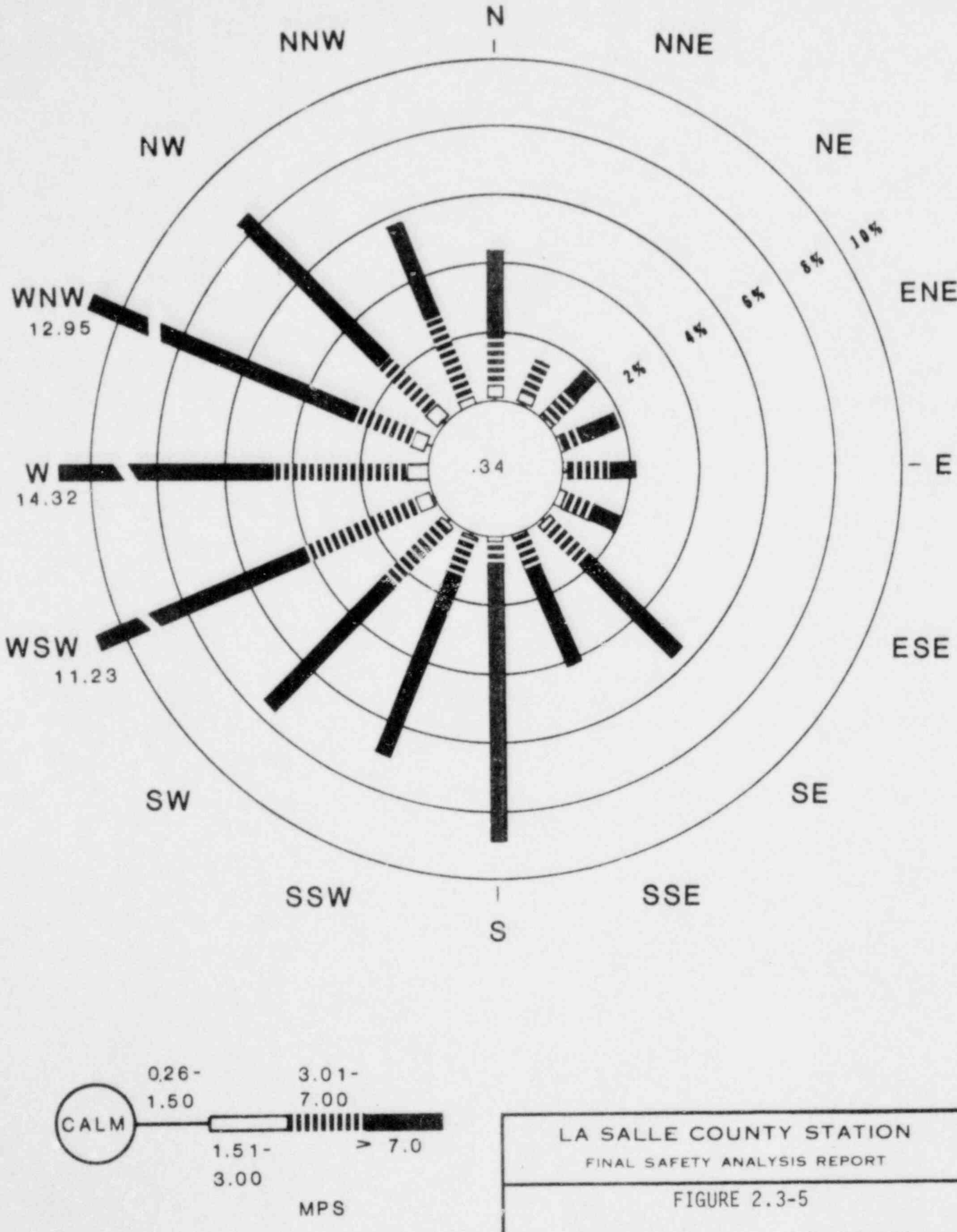

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FIGURE 2.3-5

DECEMBER 1976 AND DECEMBER 1977
WIND ROSE 375-FOOT LEVEL

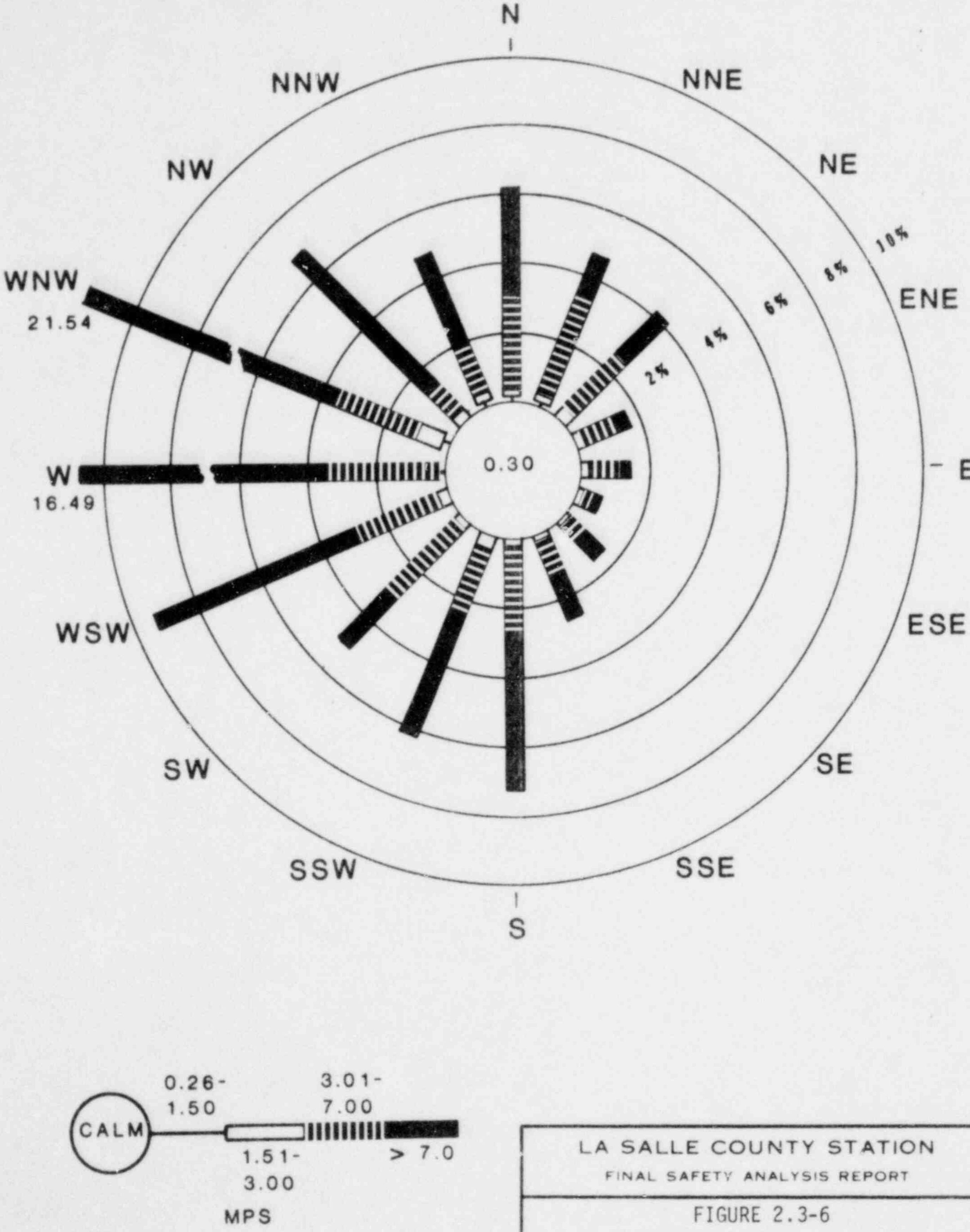

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FIGURE 2.3-6

JANUARY 1977 AND JANUARY 1978
WIND ROSE 375-FOOT LEVEL

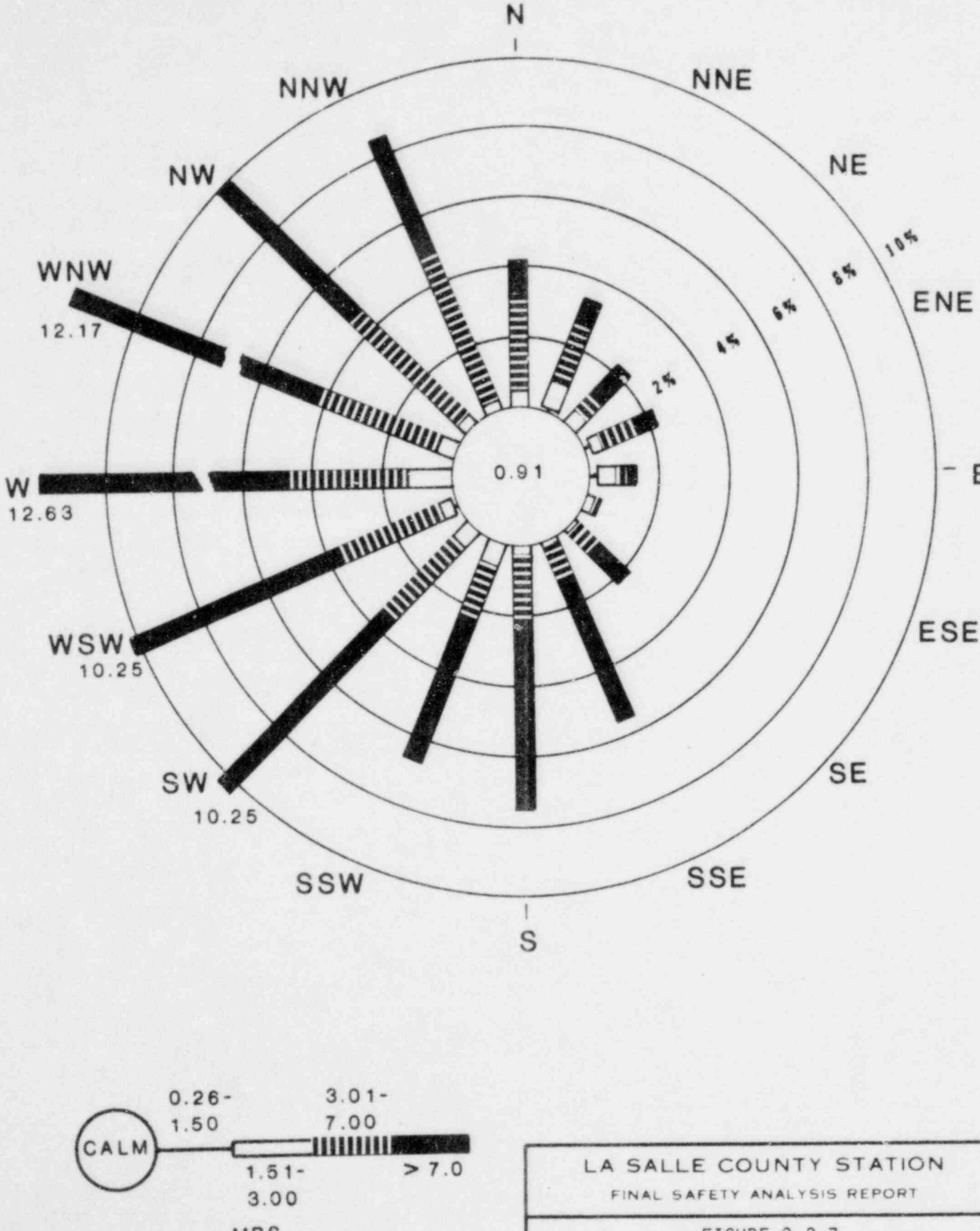

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FIGURE 2.3-7

FEBRUARY 1977 AND FEBRUARY 1978
WIND ROSE 375-FOOT LEVEL

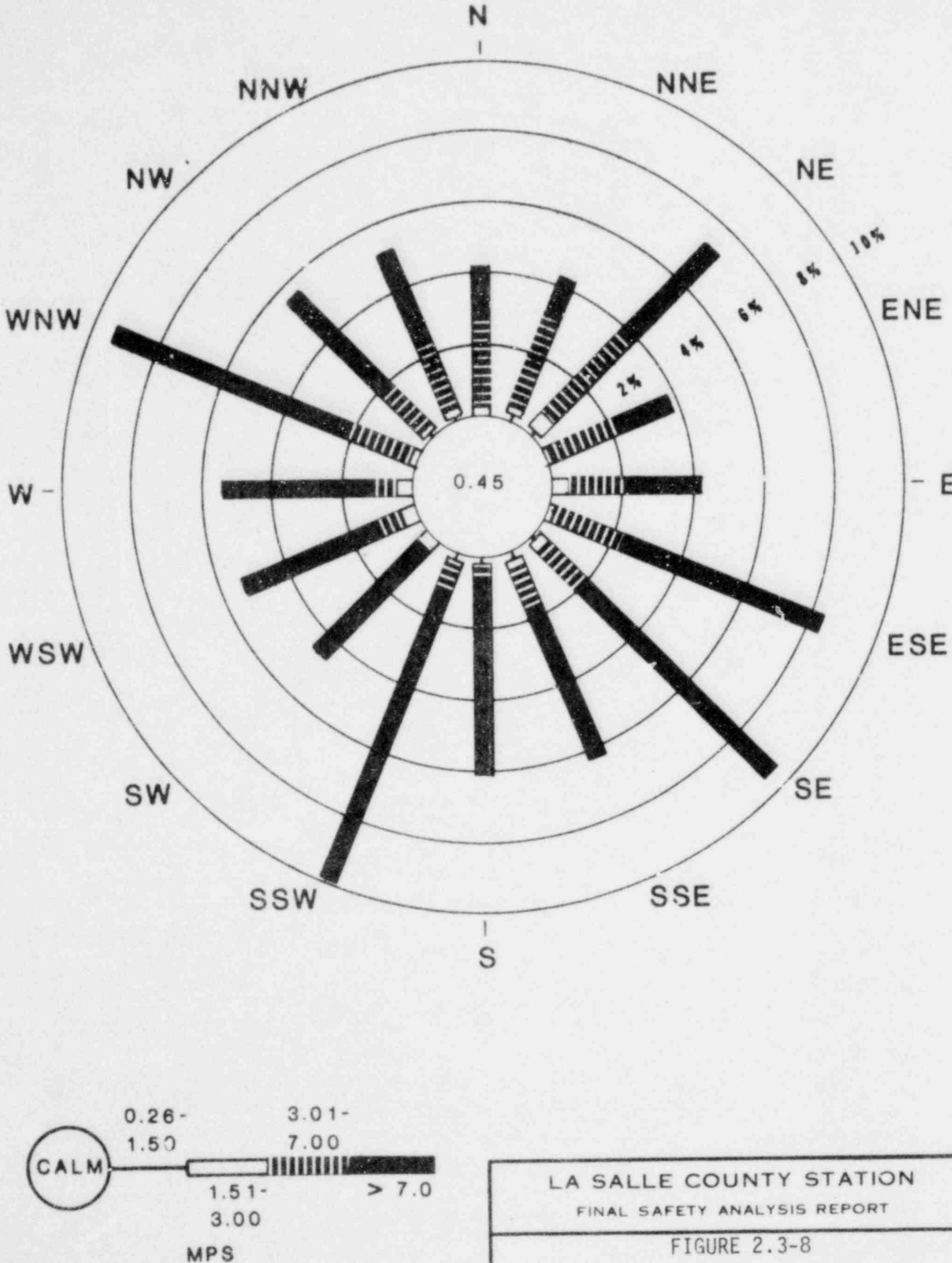

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FIGURE 2.3-8

MARCH 1977 AND MARCH 1978
WIND ROSE 375-FOOT LEVEL

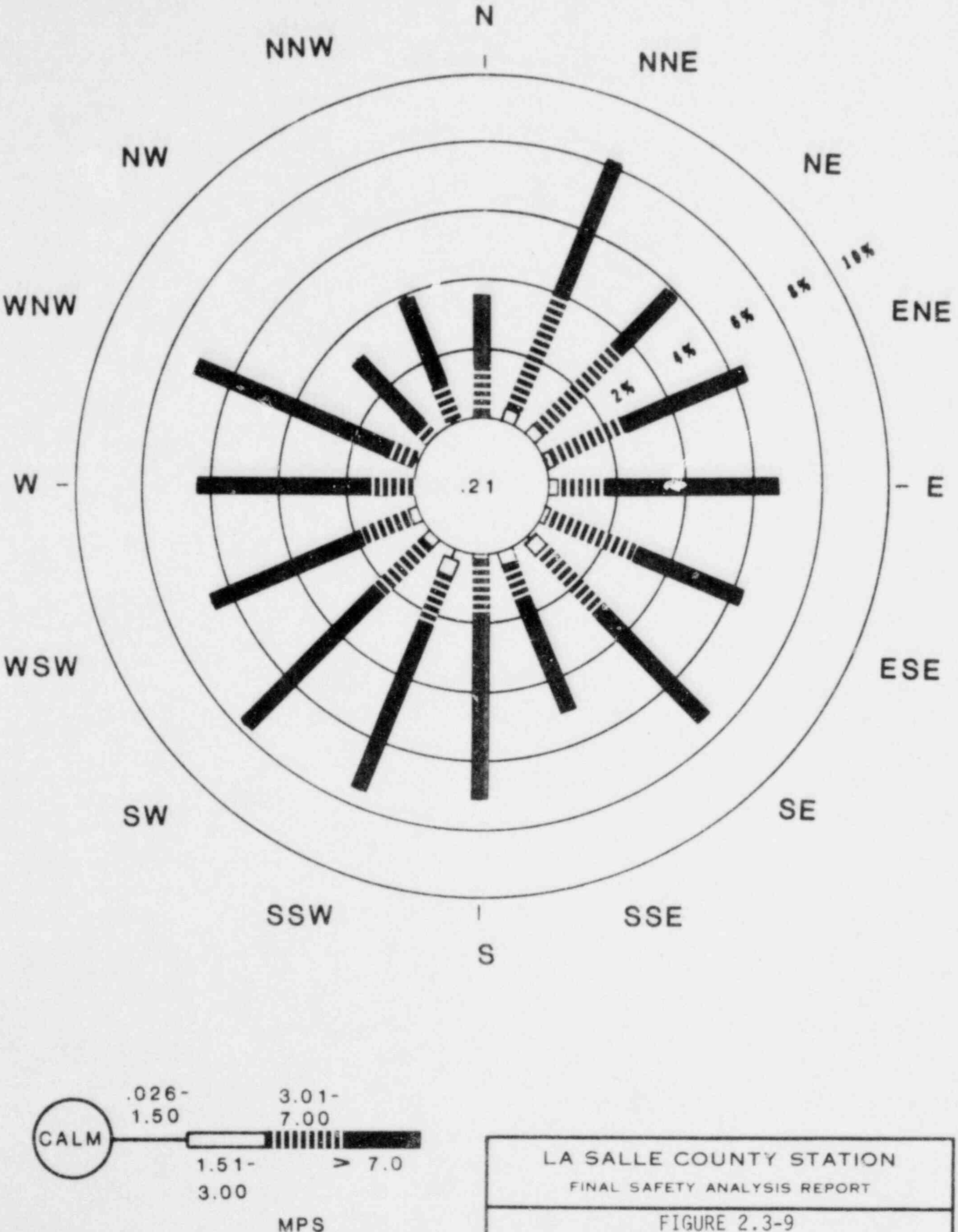

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FIGURE 2.3-9

APRIL 1977 AND APRIL 1978
WIND ROSE 375-FOOT LEVEL

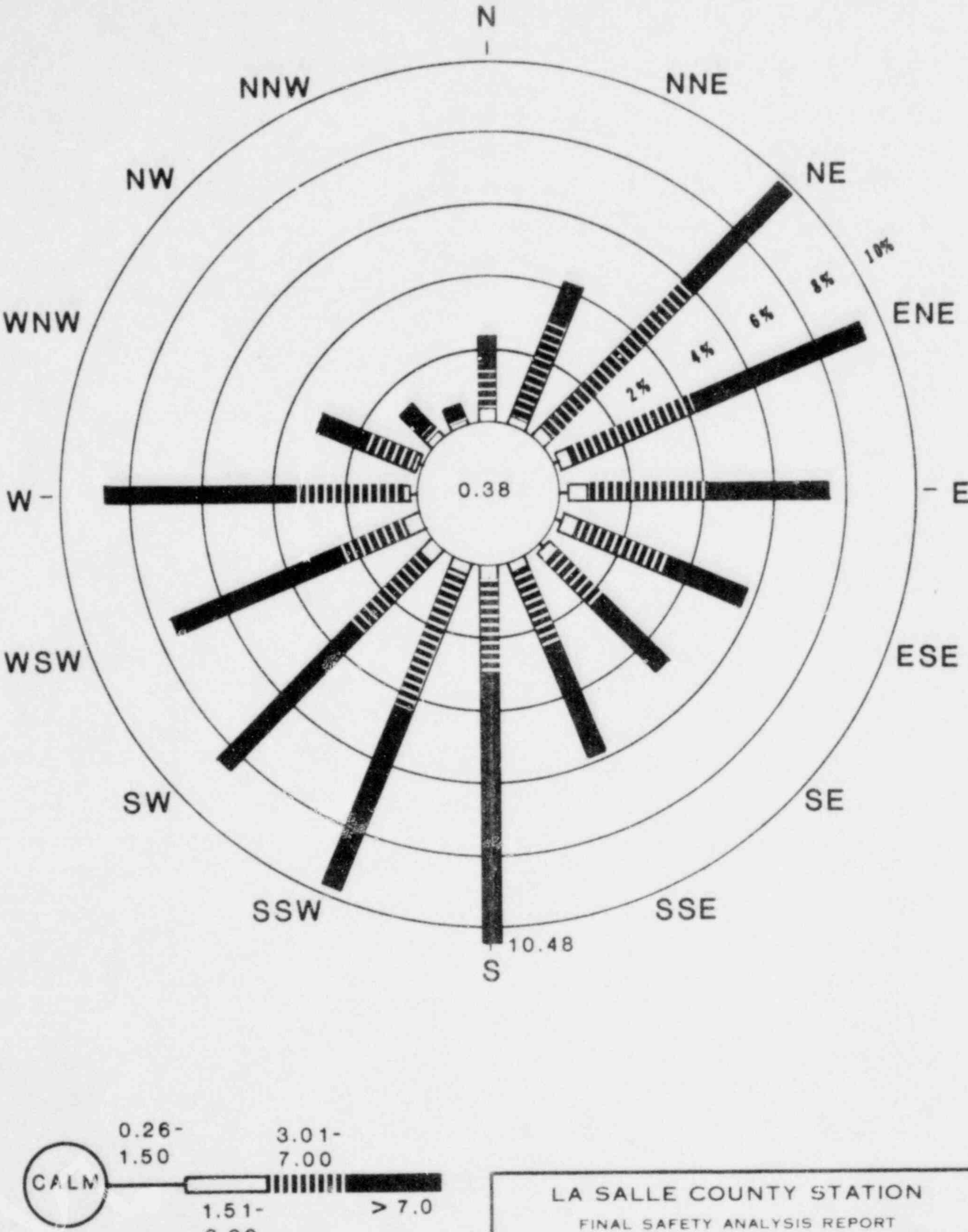

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FIGURE 2.3-10

MAY 1977 AND MAY 1978
WIND ROSE 375-FOOT LEVEL

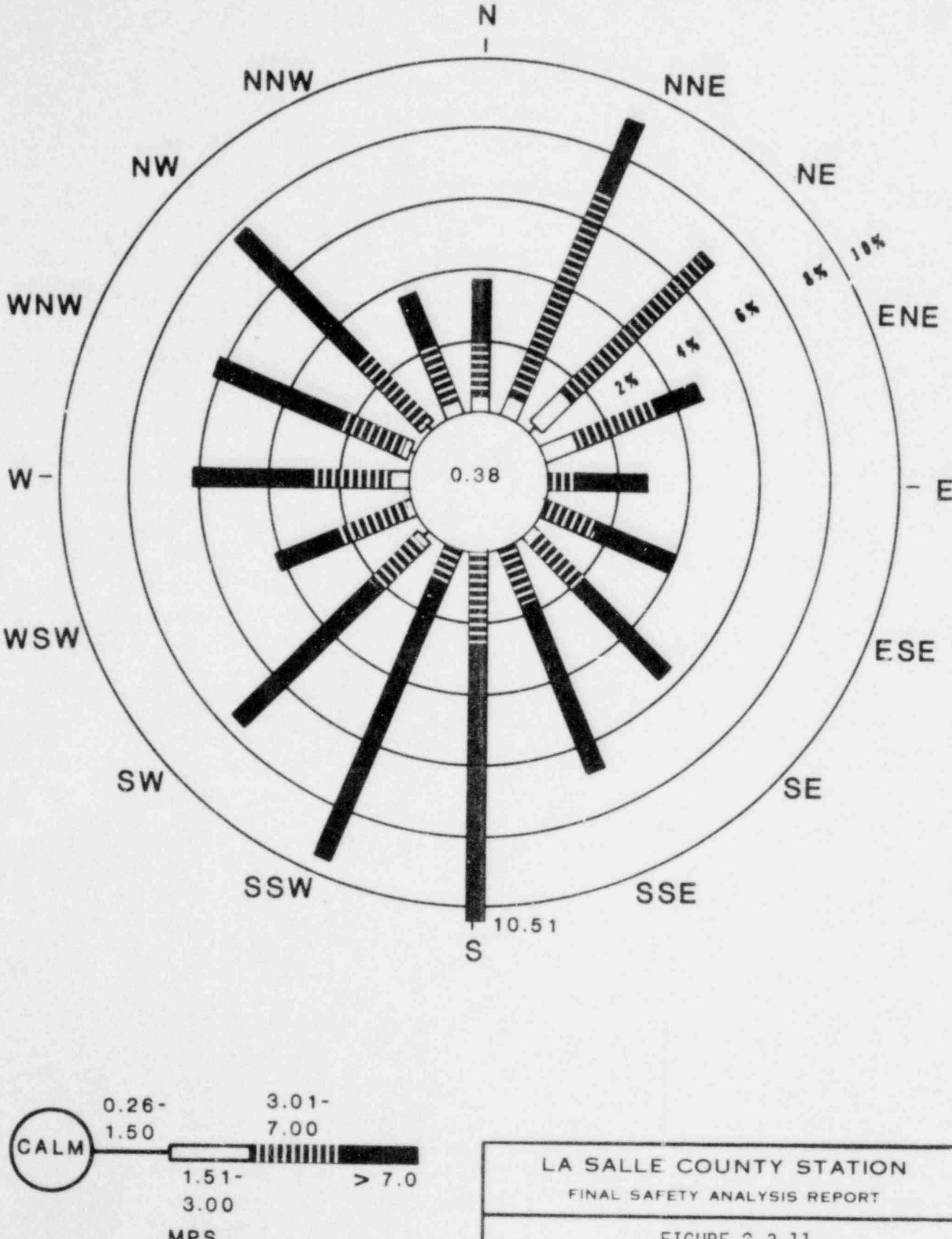

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FIGURE 2.3-11

JUNE 1977 AND JUNE 1978
WIND ROSE 375-FOOT LEVEL

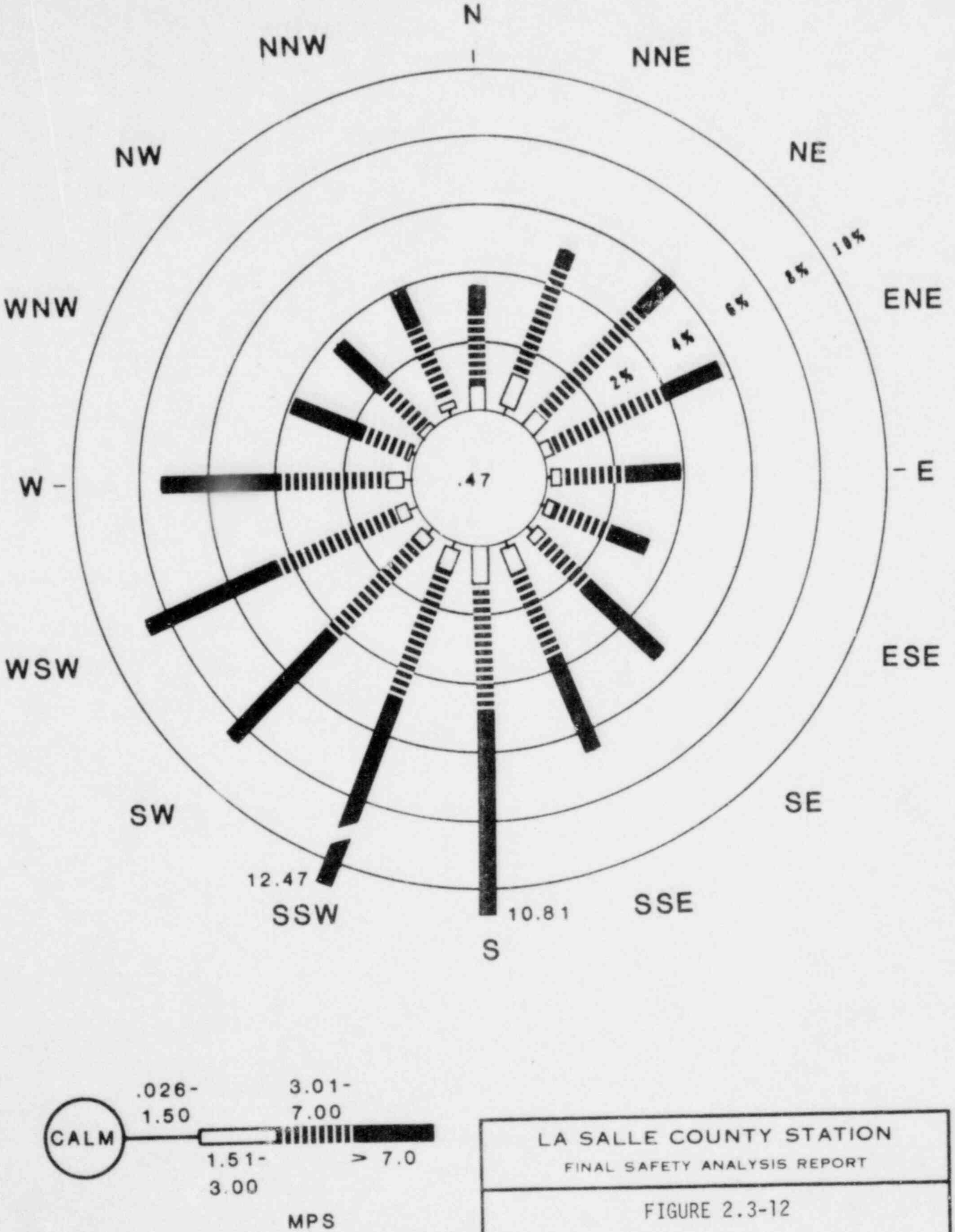

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FIGURE 2.3-12

JULY 1977 AND JULY 1978
WIND ROSE 375-FOOT LEVEL

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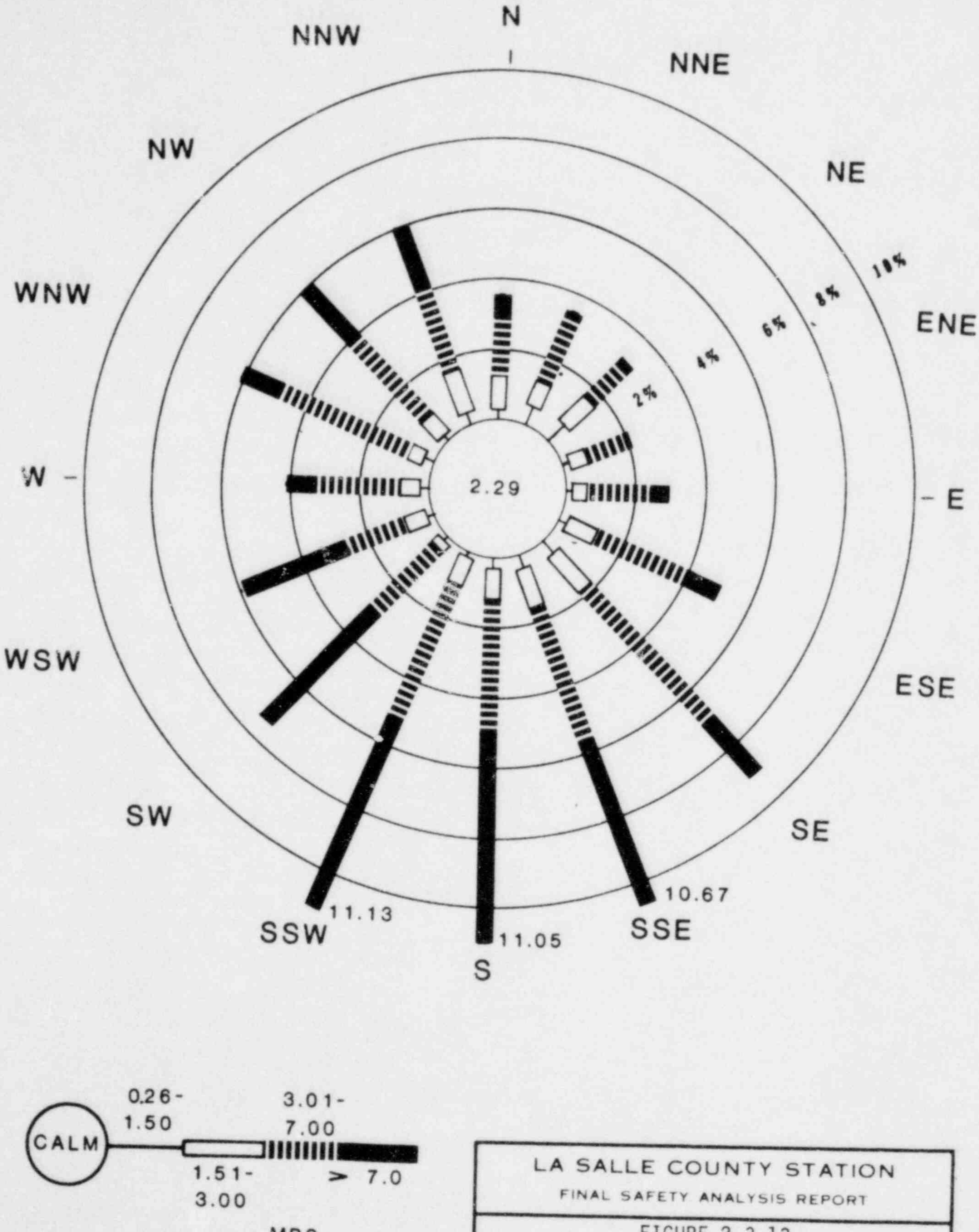

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FIGURE 2.3-13

AUGUST 1977 AND AUGUST 1978
WIND ROSE 375-FOOT LEVEL

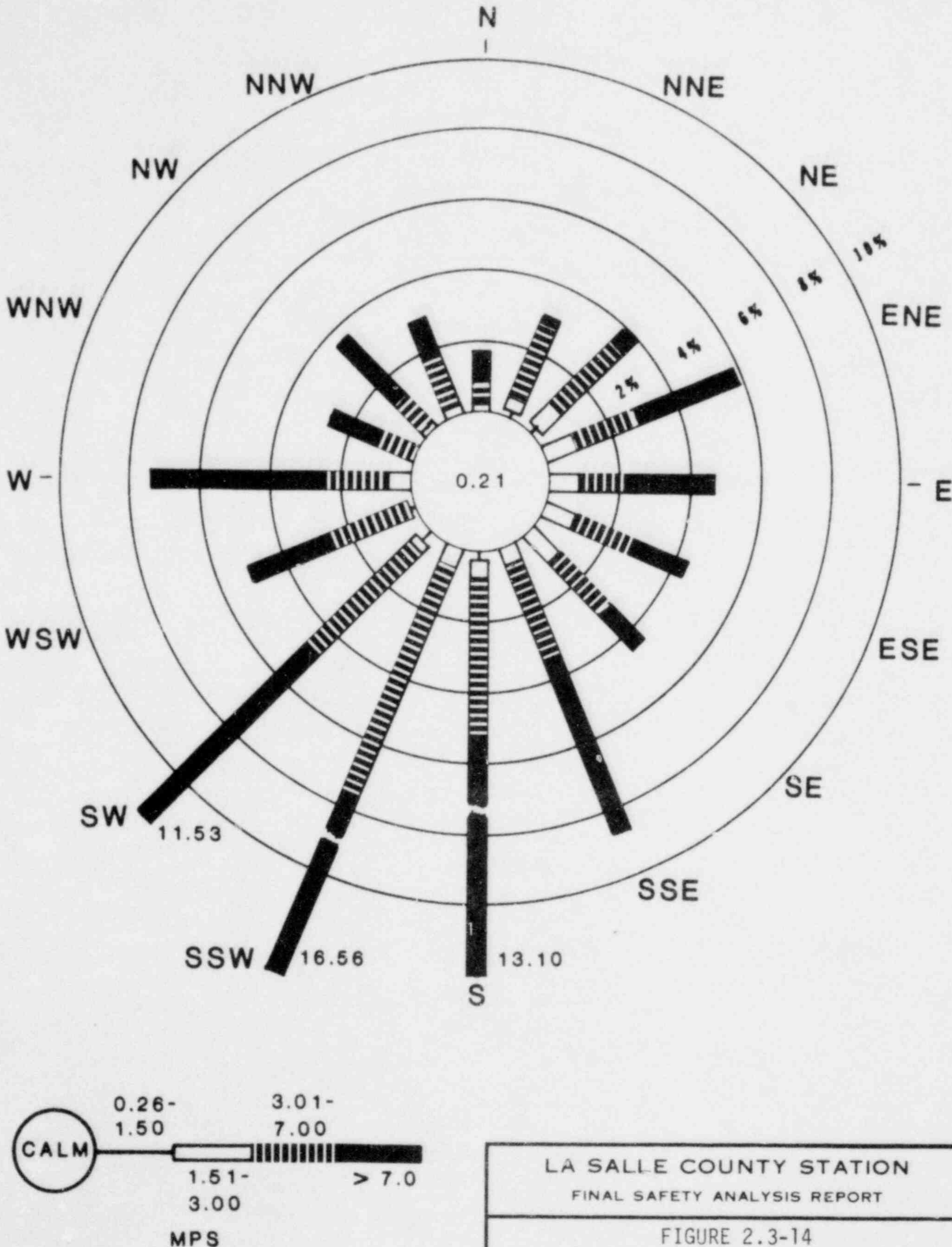

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FIGURE 2.3-14

SEPTEMBER 1977 AND SEPTEMBER 1978
WIND ROSE 375-FOOT LEVEL

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 3.0*

FSAR SECTION	QUESTION NUMBER				
3.1	031.3	031.11			
3.1.2	031.88	031.100			
3.2	040.65	011.1	011.2	011.3	011.4
	011.5	011.6	011.7	011.8	011.9
	321.10	011.12	011.13		
3.2.1	021.2				
3.4	010.9	010.10	010.11	010.24	
3.4.2	362.26	362.27			
3.5	130.2	312.3	312.4	312.5	312.6
	130.8	312.29			
3.5.1	010.12	212.1	212.3	212.4	312.19
	212.75	010.25	212.139		
3.5.2	010.13				
3.6	010.1	010.14	010.15	010.27	010.26
3.6.2	111.1	111.2	111.3	111.4	111.5
	111.6	111.7	111.8	111.9	111.10
	111.11	111.12	111.13	111.44	111.45
	111.46	111.52	111.51	111.53	111.72
	111.50	111.82			

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

CHAPTER 3.0 (Cont'd)

FSAR SECTION	QUESTION NUMBER				
3.7.1	130.1	131.1	131.2	131.3	130.7
3.7.2	130.3	130.5	130.6	131.4	131.5
	131.6	131.7	131.8	131.9	131.10
	362.24	130.9	130.10	130.11	130.12
	130.13	130.14	130.15	130.16	130.17
3.7.3	131.11				
3.8.1	131.12				
3.8.3	131.13				
3.8.4	131.13				
3.8.5	362.8	362.25			
3.9	111.74				
3.9.1	111.16	111.17			
3.9.2	111.18	111.19	111.20	111.21	111.22
	111.23	111.24	111.25	111.26	111.27
	111.28	111.47	031.204	111.54	111.55
	111.73	111.75			
3.9.3	111.29	111.30	111.31	111.32	111.33
	111.34	111.35	111.36	111.37	111.38
	111.39	111.48	111.62	111.59	111.56
	111.57	111.58	111.60	111.61	111.63
	111.78	111.80	111.83		
3.9.4	111.35				
3.9.6	111.49				
3.10	031.52	031.83	040.65	040.67	031.133
	031.148	040.96	031.236	031.244	
3.10.1	031.84				
3.10.3	111.40				
3.10.5	111.41	111.42	111.43		

CHAPTER 3.0 (Cont'd)

FSAR SECTION	QUESTION NUMBER				
3.11	031.6	031.65	031.83	031.105	040.66
	040.67	312.20	031.170	031.205	031.154
	031.169	031.164	040.94	040.95	040.96
	040.97	031.210	031.216	031.217	031.218
	031.219	031.225	040.110	031.249	031.250
	031.258				
3.11.2	031.4	031.25	031.156		
3.11.3	031.5				

TABLE 3.11-2 (Continued)

COMPONENT	COMPONENTS NOT REQUIRED TO BE OPERABLE BUT MUST REMAIN IN A SAFE MODE UNDER THE FOLLOWING CONDITIONS		DURATION(2)
<u>Isolation Valves</u> Main steamlines, steam drain lines, RHR steamline, water line RCIC steamline, operators, cables (power and instrumentation)	Temperature (7) Pressure Relative Humidity	340°-212° F 7 in. water gauge all steam	1-2 hours
	Temperature Pressure Relative Humidity	212° F (5) 7 in. water gauge all steam	2-6 hours
	Temperature Pressure Relative Humidity	150° F (6) 7 in. water gauge 100 percent	6-10 hours
	Temperature Pressure Relative Humidity	150° F -0.72 in. water gauge 90 percent maximum	10 hours to 100 days
<u>Control Rod Hydraulic System</u> Portion of system necessary for scram	Temperature Pressure Relative Humidity	212° F 7 in. water gauge all steam	1- hours
	Temperature Pressure Relative Humidity	150° F -0.72 in. water gauge 90 percent maximum	6 hours to 100 days
<u>Flammability Control System</u> Isolation valve operators and cabling (power and instrumentation) blowers, instrumentation, electrical equipment and cables (power and instrumentation)	Temperature Pressure Relative Humidity	212° F (5) 7 in. water gauge all steam	0-6 hours
	Temperature Pressure Relative Humidity	150° F (6) 7 in. water gauge 100 percent	6-12 hours
	Temperature Pressure Relative Humidity	150° F (3)(4) -0.72 in. water gauge 90 percent maximum	12 hours to 100 days

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CHAPTER 4.0 (Cont'd)

FSAR SECTION	QUESTION NUMBER			
4.6	031.183	212.140		
4.6.1	031.83	212.5	212.6	212.76
4.6.2	031.83			
4.6.3	212.7	212.8		
4.6.4	212.9			
4.6.5	212.9			

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 5.0*

FSAR SECTION	QUESTION NUMBER				
5.0	031.15	212.41			
5.2	031.141	031.211	031.213		
5.2.1	011.10	011.11			
5.2.2	031.83	031.85	211.1	212.10	212.11
	212.12	212.13	212.14	212.77	212.136
5.2.3	121.1	121.2	122.2	122.3	
5.2.4	121.4				
5.2.5	212.15	212.16	212.17	212.18	212.87
	212.81	212.82	212.78	212.79	212.84
	212.80	212.83	212.85	212.86	212.137
	212.138				
5.3.1	121.3				
5.3.3	121.5	121.6			
5.4	040.77	040.78	212.19	031.162	040.100
5.4.1	031.83				
5.4.6	212.10	212.21	212.22	212.44	212.88
	212.102	212.129	212.130	212.141	
5.4.7	212.24	212.25	212.27	212.28	212.42
	212.90	212.89	212.100	212.133	
5.5	212.99				

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 6.0*

FSAR SECTION	QUESTION NUMBER				
6.0	031.8	031.15	040.74		
6.1.2	312.21				
6.1.3	312.22				
6.2	031.154	031.225			
6.2.1	021.1	021.3	021.4	021.5	021.6
	021.7	021.8	021.9	021.15	021.16
	021.17	021.18	021.36	021.38	021.39
	021.40	021.42	021.43	021.44	021.45
	021.46	021.47	021.48	021.49	021.50
	021.51	021.52	021.62	021.69	031.155
	021.65	021.70			
6.2.2	021.10	021.19	021.72	021.21	021.22
	031.37	212.26	021.63	021.64	021.71
6.2.3	021.11	021.23	021.24	021.25	021.26
	021.66	021.68			
6.2.4	021.12	021.27	021.28	021.41	031.1
	031.7	031.19	031.83	021.67	031.160
	021.54	031.229	031.230	031.231	031.235
6.2.4.2	031.229	031.230	031.231	031.235	031.259
6.2.5	021.13	021.14	021.29	021.30	[illegible]
	021.32	423.41	021.56	021.55	[illegible]7
	021.58	021.73			
6.2.6	021.33	021.34	021.35	021.59	021.[illegible]0
	021.61	021.53			
6.3	040.72	040.88	212.15	212.26	212.29
	212.30	212.31	212.32	212.33	212.34
	212.35	212.36	212.37	212.38	212.39
	212.40	212.41	212.44	212.52	212.70
	212.87	212.111	212.112	212.124	212.91
	212.92	212.93	212.96	212.99	031.168
	212.94	212.100	212.123	212.101	212.95

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

CHAPTER 6.0 (Cont'd)

FSAR SECTION	QUESTION NUMBER				
6.3 (Cont'd)	212.121	040.105	031.211	031.212	212.125
	212.126	212.127	212.128	212.134	212.143
	212.131				
6.3.1	031.9	031.66			
6.3.2	031.11	031.87	212.43	212.44	212.45
	212.97	212.102	212.98		
6.3.3	031.83	212.46	212.47		
6.3.4	212.48	212.103			
6.4	031.126	312.7	312.8	312.9	312.10
	312.11	312.12	312.23	312.31	312.30
	031.174	312.31	031.238		
6.5	312.13	312.14	312.15	312.24	031.172
6.5.1	031.100	321.7			
6.7	031.151	031.152			
6.7.1					
6.7.2					
6.7.3					
6.7.4					
6.7.5	031.153				
6.A	221.19				

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 7.0*

FSAR SECTION	QUESTION NUMBER				
7.0	031.4	031.15	031.20	031.27	031.56
	040.69	040.70	040.71	031.54	040.98
7.1	040.68	031.50	031.173	212.104	031.172
7.1.2	031.9	031.12	031.13	031.14	031.37
	031.66	031.67			
7.1.3	031.16	031.89			
7.2	031.25	031.31	040.73	031.166	031.133
	031.134	031.143	031.163	031.198	031.139
	031.223	031.224	031.252		
7.2.1	031.3	031.17	031.18	031.21	031.24
	031.83	031.88	031.89	031.90	031.97
	031.177				
7.2.2	031.144				
7.3	031.19	031.31	031.40	031.41	031.46
	031.102	040.70	040.76	031.100	031.170
	031.166	031.177	031.135	031.140	031.134
	031.158	031.160	031.163	031.168	031.139
	031.172	040.99	031.209	031.212	031.213
	031.220	031.226	031.227	031.228	031.229
	031.230	031.232	031.235	031.253	
7.3.1	031.9	031.28	031.29	031.30	031.32
	031.33	031.36	031.37	031.39	031.55
	031.66	031.79	031.83	031.87	031.91
	031.96	031.97	031.101	031.107	031.126
	031.155	031.165	031.180	031.147	
7.3.1.1	031.246	031.247			
7.3.2	031.13	031.42	031.43	031.44	031.45
	031.83	031.89	031.94	031.95	031.98
	031.103	031.104	031.105	031.106	031.107
	031.108	031.136	031.149	031.147	031.159
7.3.2.2	031.237	031.241	031.260		
7.3.2.7	031.262				
7.3.5	031.161				

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

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FSAR SECTION	QUESTION NUMBER				
7.4	031.46	040.78	031.214		
7.4.1	031.7	031.50	031.83	031.110	031.138
	031.261				
7.4.2	031.13	031.48	031.66	031.95	031.103
	031.111	031.112			
7.5	031.51	040.72	040.75	031.134	031.222
7.5.1	031.49				
7.5.2	031.52	031.91	031.113	031.133	
7.6	031.102	031.158	031.182	031.221	031.226
	031.227	031.228			
7.6.1	021.56	031.13	031.53	031.83	031.109
	031.114	031.115	031.116	031.118	
7.7	031.162	031.154	031.183	031.215	031.225
	031.255	031.256	031.257		
7.7.1	031.83	031.118	031.119	031.120	031.157
7.8	031.103	031.137	031.207	031.240	

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7.1.2.11.2.2 Power Generation Design Bases

The power generation design bases:

a. Provide an indication and record of gross gamma radiation level in the effluent upstream of the off-gas charcoal recombiner system.

b. Provide an indication and record of count rate from the radiation activities in the effluent downstream of the off-gas charcoal recombiner system.

c. Provide grab samples from both downstream and upstream of the off-gas charcoal recombiner system treatment.

d. Provide controls to the off-gas outlet valve and the drain valve.

e. Provide controls to the off-gas bypass and treatment line valves.

f. Provide purging capability for both on-line and off-line sample chambers.

7.1.2.11.3 Station Vent Stack Radiation Monitoring Subsystem

7.1.2.11.3.1 Safety Design Basis

The subsystem shall monitor the radioactivity within the station vent stack to generate alarms if the activity level reaches either short-term or long-term release limits.

The subsystem instrumentation and controls conform to the specific regulatory requirements shown in Tables 7.1-3 and 7.1-8.

7.1.2.11.3.2 Power Generation Design Bases

The subsystem shall:

a. Provide an indication and record of the radioactive level of the station vent stack effluent in terms of count rate.

b. Provide a filter system to collect particulate and halogen samples.

c. Provide a regulated sample flow to guarantee the measured flow of sample through the filter system and the gaseous sample chamber regardless of the variation in pressure drop across filters, valves, pipes, etc.

TABLE 7.1-2 (Cont'd)

Note 2

The reactor vessel isolation control system supplied is identical to the system supplied on Zimmer-1. Instrument rack locations will be different because of the different plant designs. The primary containment isolation control system is similar to Zimmer-1.

Note 3

The neutron monitoring system for this plant is similar to that previously described for Zimmer-1.

The core size changes the number of LPRM detector assemblies--43 in LSCS, 31 in Zimmer-1, and 24 in Bailly. The number of LPRM channels averaged in each APRM is 21 and 20 for LSCS, 17 and 14 for Zimmer-1, and 24 for Bailly. The assignment pattern remains the same, so the quality of averaging is maintained.

Note 4 Reactor Vessel Instrumentation

a. Fuel Zone Range Water Level

The water level in this range is called the "Shroud Water Level" range for Hatch-1. The name was changed to "Fuel Zone," which is more descriptive of the measurement for this plant.

The average range for Hatch-1 is ± 107.5 inches with zero at the top of active fuel. The active range for LSCS is -150/0/+60, with zero at the top of active fuel. The range was changed to increase the sensitivity of the measurement without losing any useful information.

All other features of this range are identical for Hatch-1 and LSCS.

b. Wide-Range Water Level

The number of axial tap sets on the reactor pressure vessel is two for Hatch-1. The number of axial tap sets on the reactor pressure vessel is four for LSCS. The reason for this change was to facilitate four-way separation for the reactor water level and pressure instrumentation.

Hatch-1 has temperature equalization columns for the wide-range water level instrument range. The LSCS design uses a cold condensate reference leg chamber

7.3.1.1.8.4 Bypasses and Interlocks

All the motorized isolation valves pertinent to an SGTS equipment train are interlocked with the operation of the SGTS fan through a relay circuit. The SGTS cooling fan is interlocked not to operate when the SGTS fan is in operation. To protect against overheating, the electric heating coil for relative humidity control is interlocked with the SGTS fan operation, and high temperature is alarmed on the main control board.

Air flow through each SGTS is controlled automatically with a corresponding modulating valve, and flow is indicated on the main control board.

On stopping of the SGTS fan, the SGTS cooling fan is automatically started and the proper isolation valves opened to dissipate the decay heat from the charcoal adsorber. To prevent fire in the charcoal beds, two deluge valves are provided which can be operated through handswitches on the main control board when charcoal bed high temperature is annunciated.

7.3.1.1.8.5 Redundancy and Diversity

Each standby gas treatment unit is automatically initiated by two independent trip logics. To initiate a standby gas treatment unit, both trip logics must be tripped. Instrumentation for each filter train with the system is completely independent of the other.

7.3.1.1.8.6 Actuated Devices

Initiation of the SGTS includes starting of the SGTS fan, energizing the electric heating, and opening the valves on the inlet and outlet sides of the SGTS equipment train.

7.3.1.1.8.7 Separation

The channels and logic circuits are physically and electrically separated to preclude the possibility that a single event can prevent operation of the SGTS system. Electrical cables for instrumentation and control on each SGTS equipment train are routed separately.

7.3.1.1.8.8 Testability

Control and logic circuitry used in the controls for the standby gas treatment system can be checked individually by applying test or calibration signals to the sensors and observing trip or control responses. Operation of the isolation valves and fans from manual switches verifies the ability of breakers and damper mechanisms to operate. The automatic control circuitry is designed to restore the standby gas treatment system to normal

b. The generating station variable which requires monitoring to provide action is the products of combustion.

c. Duct-mounted ionization detectors are located in each outside air intake duct and main return air duct connected to the main control boards.

d. The prudent operational limits of the ionization level are from 100,000 particles per cm to 200,000 particles per cm^3.

e. The ionization level is expected to be 0 ppm. Ionization levels which are more than 200,000 particles per cm^3 are considered hazardous to control room occupancy.

f. The ionization level which will cause protective action is approximatley 100,000 particles per cm^3.

g. The range of transient and steady-state electrical energy supply conditions throughout which the system must perform is described in Subsection 8.3.1. The range of environmental conditions to which the ionization detectors are subjected is the same as the main control room.

h. The minimum performance requirements for system response are 10 to 20 seconds with setpoint accuracy of 20% of sensitivity setting.

7.3.1.2.2.4 Outdoor Air Intake Ammonia Protection Portion of Control Room and the Auxiliary Electric Equipment Room HVAC Systems

a. The generating station condition which requires protective action is the ammonia level in the outside air and the subsequent isolation of air intakes.

b. The generating station variable which requires monitoring to provide action is the outdoor air ammonia concentration.

c. The minimum number of sensors required to monitor outdoor air ammonia concentration is two ammonia sensors for each of two air intakes. The ammonia is sensed upstream of intake isolation dampers, where air enters the building.

d. The operational range of the ammonia detection system is from 0 to 200 ppm.

7.3.2.7 Main Control Room and Auxiliary Electric Equipment (AEE) Room Atmospheric Control Systems

The control room and AEE room HVAC systems analysis is presented in Subsection 9.4.1. The instrumentation and controls are described in Sections 6.4 and 9.4.

7.3.2.7.1 General

The control room and AEE room HVAC systems are redundant systems, consisting of two equipment trains, the essential portions of which meet the requirements of IEEE 279-1971, Criteria for Nuclear Power Plant Protection Systems.

7.3.2.7.2 Specific Conformance of the Instrumentation and Control to IEEE 279-1971

a4.1 General Functional Requirements - The control room and AEE room HVAC systems perform the normal and safety functions during all phases of station operation and during postulated accident conditions. Except for the emergency makeup filter train, which is automatically initiated on high radiation, the systems continue to operate before, during, and after an accident.

a4.2 Single-Failure Criteria - The control room and AEE room HVAC systems consist of two full-capacity independent equipment trains which are powered from separate buses and actuated by separate control circuits. The air handling trains are equipped with redundant components described in Subsection 7.3.1.1.4.2 to ensure that a single failure will not affect the habitability of the control room and auxiliary electric equipment room.

a4.3 Quality of Components and Modules - All components of these systems are fully described in the manufacturers' technical manuals. These components are specified to comply with the functional requirements of the service in which they are used.

Each channel provides a local measurement and transmits the signal to the control room, where a permanent record is provided on recorders. Figure 7.6-3 shows the primary containment monitoring instrumentation and controls.

This subsystem is designed in accordance with Seismic Category I requirements. The piping for this subsystem is designed in accordance with ASME Section III - 1974 Class 2 requirements, up to and including the outboard isolation valves.

7.6.1.6.3 Drywell Hydrogen Monitoring Subsystem

Initiating Circuits

Two hydrogen sensors are mounted directly in the reactor building, where drywell atmosphere samples are brought out, the measurement made, and the electrical signal is transmitted to the control room.

The volume percent of hydrogen is recorded by two stripchart recorders in the control room. The millivolt signals generated by the sensors are suitably conditioned and amplified by solid-state electronic modules for transmission to the control room. Two such units make up the total analyzer package.

The hydrogen-monitoring system utilizes a thermal conductivity sensor design concept. The sensing element generates an electrical current that is directly proportional to the hydrogen in the drywell atmosphere sample.

A self-contained sample temperature control unit ensures that the calibration of the sensor is maintained over the entire operational temperature range.

Analyzer Electronics

The analyzer electronics consists of an amplifier, power supply, divider, and recording channel. The amplifier and power supply consist of solid-state, highly reliable, proven circuits that are capble of meeting the system requirements.

The amplifier takes the cell output signal and provides a 4-20-mA signal for transmission to the control room. This volume percent hydrogen value is fed into the recorder.

Redundancy

The subsystem consists of redundant analyzer units.

Separation

Each of the redundant analyzer units is physically separated and is powered from a separate power bus.

Hydrogen-Monitoring Test and Calibration

Although the sensors are inherently stable over extended periods of time, a calibration capability is provided to guarantee greater accuracy. Sample gases can be introduced to the sample chamber by manual operation of valves from the calibration gas tanks.

The calibration cycle is completed within 2 minutes from the time the calibration gas reaches the sensor assembly. Adjustments to the calibration signal are made locally.

System startup and calibration are relatively straightforward. Power will normally be maintained to electronic components to eliminate warmup requirements.

Environmental Considerations

The hydrogen-monitoring equipment is located in the reactor building. Equipment located in the reactor building is designed to remain functional in the environment which results from a loss-of-coolant accident. See Table 3.11-2 for a description of the reactor building environments.

Operational Considerations

The hydrogen subsystem is automatically activated on the occurrence of a loss-of-coolant accident and remains in operation after initiation unless turned off with a handswitch. The hydrogen concentration is recorded up to 10%, with an accuracy of ±5% of the readout. An alarm is activated on high concentration.

7.6.1.6.4 Drywell and Suppression Chamber Gross Gamma

Monitoring Initiating Subsystem Circuits

Two gamma-sensitive instrumentation channels monitor the radiation in the drywell and suppression chamber atmospheres. Two detectors are located on sample lines leading to the hydrogen monitoring panels discussed in Subsection 7.6.1.6.3. Each detector is shielded from background radioactivity. Each instrument channel consists of a gamma-sensitive scintillation detector and a log radiation monitor. Each log radiation monitor has an upscale trip circuit which is used to initiate an alarm on high radiation. The output from each log radiation monitor is displayed on a five-decade meter on the local panel and on separate stripchart recorders located in the control room.

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TABLE 7.6-2

PROCESS RADIATION MONITORING SYSTEMS CHARACTERISTICS

MONITORING SUBSYSTEM	INSTRUMENT*	INSTRUMENT SCALE (Decade Log)	TRIPS PER UPSCALE	CHANNEL DOWNSCALE
Air ejector off-gas				
(pretreat)	1 to 10^6 mR/h	6	1	1
(posttreat)	10 to 10^6 counts/min	5	3	1
Station vent stack	10 to 10^6 counts/min**	5	2	1
Process liquid	10 to 10^6 counts/min**	5	1	1
Carbon bed vault	1.0 to 10^6 mR/h	6	1	1

*Range of measurements depends on items such as source geometry, background radiation, shielding, energy levels, and method of sampling.

**Readout depends on the pulse height discriminator setting.

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 8.0*

FSAR SECTION	QUESTION NUMBER				
8.0	031.56	040.69	040.71	040.74	040.98
8.1	031.9	031.55	040.68	040.79	040.80
	040.81	040.82	040.101		
8.1.1	031.57				
8.2	040.82	040.83	040.84	040.103	
8.3	031.72	031.64	040.70	040.72	040.73
	040.75	040.76	040.77	040.78	040.84
	040.85	040.86	040.88	040.89	040.104
	040.106	040.109	040.99	040.105	031.208
	031.248				
8.3.1	031.58	031.59	031.60	031.165	
8.3.2	031.61	040.87			

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 9.0*

FSAR SECTION	QUESTION NUMBER				
9.0	010.16	031.15	010.31		
9.1	031.191				
9.1.1	010.17	232.9	232.10	232.12	
9.1.2	010.2	010.3	010.18	232.11	010.28
9.1.3	010.5	010.19	031.121	010.29	
9.2	031.173	031.191	031.194	031.242	
9.2.1	010.20	031.63	031.99	031.121	
9.2.2	031.121				
9.2.5	010.6	010.7			
9.2.9	010.20				
9.2.10	031.75				
9.3.2	321.8				
9.3.5	031.161				
9.4	321.9	031.191	031.239		
9.4.1	010.22	010.23	031.83	031.126	010.30
	031.238				
9.4.5	031.83	031.121	031.127	031.171	
9.4.9	021.47				

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

CHAPTER 9.0 (Cont'd)

FSAR SECTION	QUESTION NUMBER				
9.5	040.76	010.31	010.33	010.34	010.35
	010.36	010.37	010.38	010.39	010.40
	010.41	010.42	010.43	010.44	010.45
	010.46	010.47	010.48	010.49	010.50
	010.51	010.52	010.53	010.54	010.55
	010.56				
9.5.1	010.8	031.122	421.1	421.2	422.16
9.5.2	031.123	031.188			
9.5.4	040.1	040.2	040.3	040.4	040.5
	040.6	040.7	040.8	040.9	040.10
	040.11	040.12	040.13	040.14	040.15
	040.90	040.91			
9.5.5	040.15	040.16	040.17	040.18	040.19
	040.20	040.21	040.22	040.23	040.24
	040.25	040.92	040.93		
9.5.6	040.15	040.26	040.27	040.28	040.29
	040.30	040.31			
9.5.7	040.15	040.32	040.33	040.34	040.35
	040.36	040.37			
9.5.8	040.15	040.38	040.39	040.40	040.41
	040.42				

Future Committal

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 15.0*

FSAR SECTION	QUESTION NUMBER				
15.0	031.9	031.20	031.121	211.2	211.3
	212.49	212.50	212.51	212.52	212.53
	212.54	212.57	212.10	212.111	212.112
	212.105	212.107	212.108	212.109	212.144
15.0.5	031.83				
15.1	031.41	212.55	031.145		
15.1.1	212.56	031.167	212.142		
15.1.2	031.124	212.58	212.59	212.113	
15.1.3	031.124				
15.2	031.83	212.60	031.177	031.145	212.114
	212.141				
15.2.2	031.124	212.61	212.62	212.115	
15.2.3	031.124	212.61	212.62		
15.2.4	212.63				
15.2.6	031.124	031.125	212.64	031.176	212.116
	031.142				
15.2.7	212.65	212.117			
15.4	031.182	031.221			
15.4.1	031.54				
15.4.2	031.14	212.66	212.67		
15.4.4	031.83	212.68	212.118		
15.4.5	212.69				
15.4.9	212.70	212.121			

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

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CHAPTER 15.0 - ACCIDENT ANALYSES

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LIST OF TABLES (Cont'd)

CHAPTER 15.0 - ACCIDENT ANALYSES

LIST OF FIGURES

LIST OF FIGURES (Cont'd)

	Turbine trip initiates bypass operation.
0.01	Main turbine stop valves reach 90% open position and initiate reactor scram trip.
	Main turbine stop valves reach 90% open position and initiate a recirculation pump trip (RPT).
0.10	Turbine stop valves closed.
	Turbine bypass valves start to open to regulate pressure.
0.14	Recirculation pump motor circuit breakers open causing decrease core flow to natural circulation.
1.55, 1.69, 1.84, 2.02, and 2.30	Relief valves actuated sequentially by groups: 1, 2, 3, 4, and 5.
4.53	Feedwater trip on high water level (L8).
(Est) 5.2, 5.5, 5.9, 6.2 and 7.0	Relief valves close sequentially by groups: 5, 4, 3, 2, and 1.
30.6	Bypass valve initiates to close on pressure signal.
32.2 (est)	Turbine bypass closed.
38.67	Low level trip (L2) initiates a main steam line isolation.
	Low level trip (L2) initiates RCIC and HPCS (not simulated).
39.23	Turbine bypass reopen on pressure increase at turbine inlet.

Turbine trip at high power with accompanying failure of the bypass valves (Figure 15.2.3-2) produces the following sequence of events:

Time (sec)	Event
0	Turbine trip initiates closure of main stop valves.
	Turbine bypass valves fail to operate.
0.010	Main turbine stop valves reach 90% open position and initiate reactor scram trip.
	Main turbine stop valves reach 90% open position and initiate a recirculation pump (RPT) trip.
0.1	Turbine stop valves closed.
0.140	Recirculation pump motor circuit breakers open causing decrease in core flow to natural circulation.
1.28, 1.37, 1.47, 1.57 and 1.68	Relief valves actuated sequentially by groups: 1, 2, 3, 4, and 5.
5.98	L8 trip initiate a feedwater pump trip.
(Est) 7.3, 7.7, 8.0, 8.3 & 9.2	Relief valves close sequentially by groups: 5, 4, 3, 2, and 1.
11.31	Group 1 relief valves reactuated on high pressure.
13.06	Group 2 relief valves reactuated.
17.6 (est)	Group 2 relief valves closed.
18.6 (est)	Group 1 relief valves closed.
25.43	Group 1 relief valves actuated.
26.70	Low level trip (L2) initiates a main steamline isolation.
	Low level trip (L2) initiates RCIC and HPCS (not simulated).

32.1 (est)	Group 1 relief valves closed.
43.22	Group 1 relief valves cycle open and close on pressure.

All plant control systems maintain normal operation unless specifically designated to the contrary. Turbine stop valve closure initiates a reactor scram trip via position signals to the protection system. Credit is taken for successful operation of the reactor protection system. Turbine stop valve closure initiates recirculation pump trip (RPT) thereby terminating the jet pump drive flow. The pressure relief system which operates the relief valves independently when system pressure exceeds relief valve instrumentation setpoints is assumed to function normally during the time period analyzed.

The turbine trips are analyzed in an equivalent way. The only difference is that failure of the main turbine bypass system is assumed for the entire transient time period analyzed as part b. If the turbine trip occurs at a power level below 30% NBR a trip inhibit signal derived from first stage turbine pressure is activated. The normal bypass capacity is adequate to dump the steam load to the condenser without the necessity of shutting down the reactor. All other protection system functions remain functional as before and credit is taken for those protection system trips. A low-power turbine trip with failure of the bypass capability will follow the pattern of a high power turbine trip with bypass failure except the RPT and turbine stop valve closure scram trip is normally inoperative. The high flux, high pressure, high water level scrams will still protect the reactor should a single failure occur.

If a turbine trip occurs during normal system operation above 30% NBR, the mitigation of pressure increase is accomplished by the reactor protection system functions. The main turbine stop valve closure trips and RPT trips are redundantly built to satisfy single failure criteria.

Operator actions during this transient normally include the following: verification that auto transfer of generator-supplied busses to incoming (if auto transfer does not occur, manual transfer must be made); monitor reactor scram for normal rods in condition; monitor and maintain reactor water level as needed; observe proper turbine operation during coastdown; and, depending on conditions, initiate normal post shutdown cooling procedures or maintain pressure for restart of the unit. Checking proper safety/relief valve closure and suppression pool temperature are power generation objectives and are not needed to safely terminate a turbine trip.

15.2.3.3 Core and System Performance

Mathematical Model

The computer model referenced in Subsection 15.1.1.3 was used to simulate these events.

Input Parameters and Initial Conditions

These analyses have been performed, unless otherwise noted, with input parameters and initial conditions as tabulated in Table 15.0-2. The reactor is initially operating at 105% NBR power with vessel dome pressure of 1020 psig for these simulations.

Turbine stop valves full stroke closure time is 0.1 second.

A reactor scram is initiated by position switches on the turbine stop valves when the valves are 90% open. This stop valve scram trip signal is automatically bypassed when the reactor is below 30% NB rated power level.

Reduction in core recirculation flow is initiated by position switches on the main stop valves, which actuate the RPT circuitry that trips the recirculation pumps.

Conservative EOC scram characteristics are used as is also time of the void reactivity coefficient and the doppler reactivity coefficient which are the same as used in the generator load rejection analysis of 15.2.1.

Results

a. The turbine trip with bypass operating normally was simulated for 105% NBR steam flow as depicted in Figure 15.2.3-1.

   Neutron flux increases rapidly because of the void reduction caused by the pressure increase. However, the flux increase is limited to 165% of rated by the turbine stop valve scram and RPT system. Peak fuel surface heat flux does not exceed 103% of its initial value.

   Peak pressure in the bottom of the vessel reaches 1164 psig, which is below the ASME code limit of 1375 psig for the reactor cooling pressure boundary. Vessel dome pressure does not exceed 1138 psig. The severity of turbine trips from lower initial power levels decreases to the point where a scram can be avoided if auxiliary power is available from an external source and the power level is within the bypass capability.

The turbine trip with failure of the bypass system was simulated for 105% NBR steam flow as depicted in Figure 15.2.3-2.

Peak neutron flux reaches 267% of its rated value, and peak fuel center temperature increases approximately 220 F. Since this event is classified as an infrequent incident, is not limited by the GETAB criteria and the MCPR limit is permitted to fall below the safety limit for incident of moderate frequency. MCPR for this transient is 1.04.

The safety/relief valves are opened and closed sequentially as the stored energy is dissipated and the pressure falls below the setpoints of the valves. Peak nuclear system pressure reaches 1193 psig at the vessel bottom, therefore, the overpressure transient is clearly below the reactor coolant pressure boundary transient pressure limit of 1375 psig. Peak dome pressure does not exceed 1166 psig.

A low power turbine trip with failure of the bypass valves is less severe than a similar one at high power. However, this transient is of interest because the turbine stop valve closure and turbine control valve closure scrams are automatically bypassed when the reactor is below 30% of rated power. At these lower power levels, turbine first stage pressure is used to initiate the scram logic bypass. The scram which terminates the transient is initiated by high vessel pressure. The bypass valves are assumed to fail; therefore, pressure will increase until it reaches the relief valve setpoint. Relatively few relief valves will open to relieve the pressure. Peak pressure at the vessel bottom remains well below the reactor coolant pressure boundary transient limit of 1375 psig. Peak surface heat flux and peak fuel center temperature remain at relatively low values and MCPR is 1.15 which is above the GETAB safety limit.

Consideration of uncertainties in these analyses involve the protective system settings, system capacities, and system response characteristics. The most conservative values were used in the analyses; for example, the slowest allowable control rod scram motion was assumed, the EOC all-rod-out condition is assumed for prescram configuration, safety/relief actions occurred at high error limit values, minimum value capacities were utilized for overpressure protection. Such conservatisms are intended to cover uncertainties as defined or anticipated.

15.2.3.4 Barrier Performance

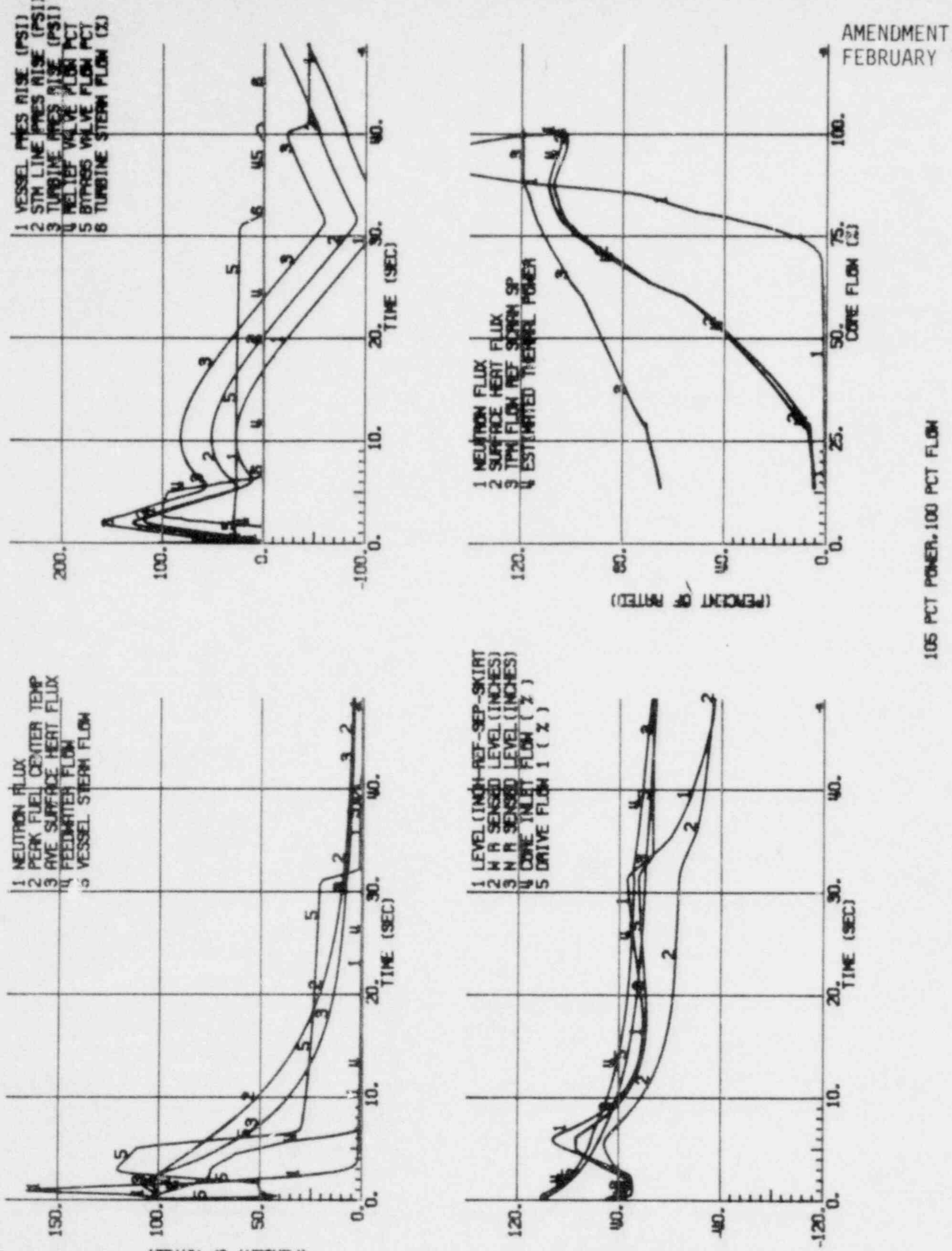
The consequences of these two versions of turbine trip do not result in any temperatures nor pressures in excess of the criteria for which the fuel clad, pressure vessel, or containment are designed; therefore, these barriers maintain their integrity.

15.2.3.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release condition. If purging of the containment is chosen the release will have to be in accordance with established technical specifications; therefore this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

15.2.3.6 References

1. R. Linford, "Analytical Methods of Plant Transient Evaluations for the General Electric Boiling Water Reactor," NEDO-10802, April 1973.



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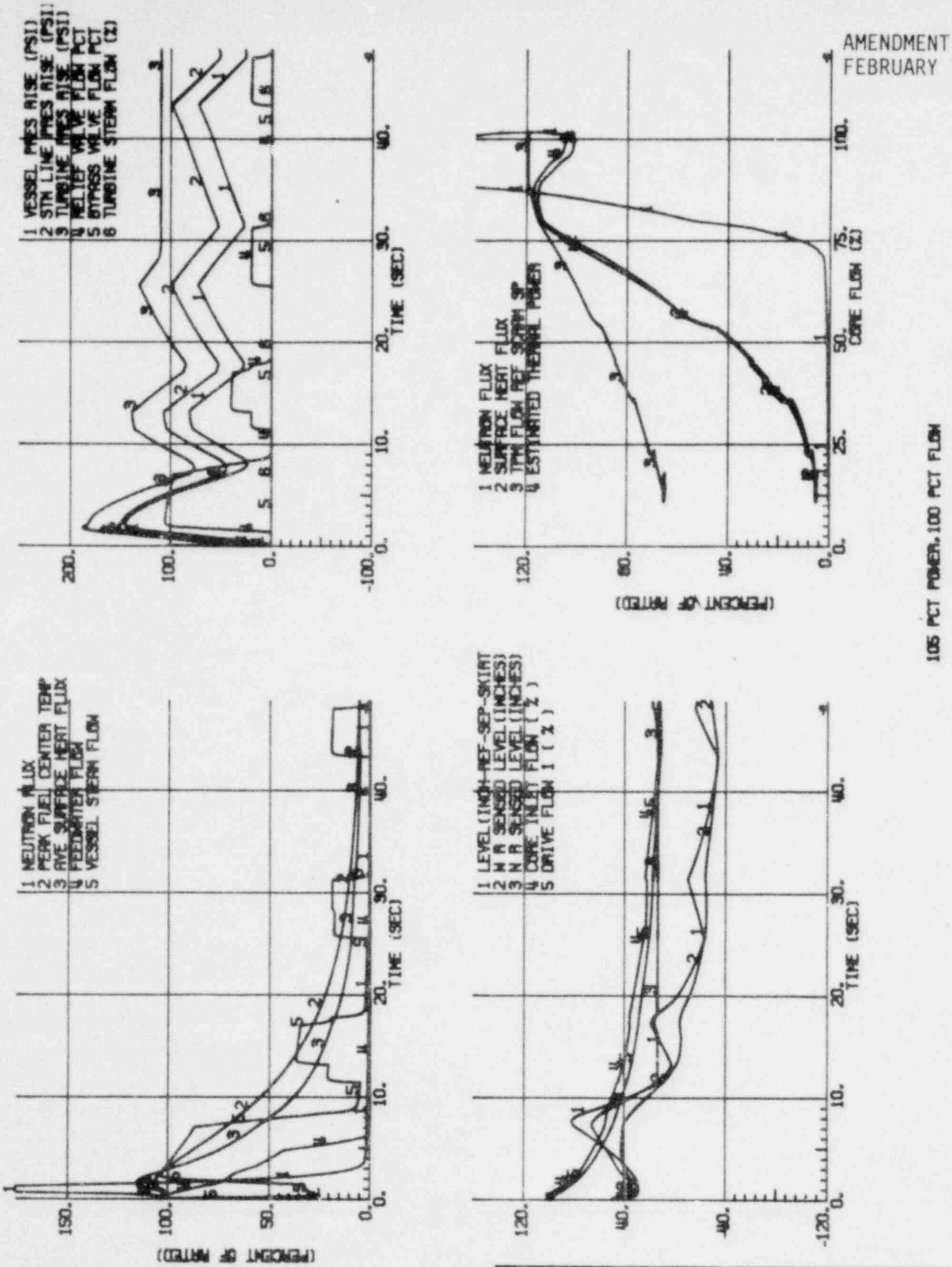
FINAL SAFETY ANALYSIS REPORT

FIGURE 15.2.3-1

TURBINE TRIP, TRIP SCRAM, BYPASS-ON, RV-ON, RPT-ON



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FINAL SAFETY ANALYSIS REPORT

FIGURE 15.2.3-2

TURBINE TRIP, TRIP SCRAM, BYPASS-OFF, RV-ON, RPT-ON

15.2.4 Inadvertent MSIV Closure

15.2.4.1 Identification of Causes and Frequency Classification

Various steamline and nuclear system malfunctions, or operator actions, can initiate main steam isolation valve closure. Examples are: low-steamline pressure, high-steamline flow, high-steamline radiation, low water level, or manual action.

Inadvertent MSIV closure is categorized as an incident of moderate frequency irrespective of whether one MSIV or all MSIV's close.

For the condition of all MSIV's closing. To define this event as the initiating event and not the byproduct of another transient, implies only the following contributions to the frequency considerations: manual action (purposely or inadvertent); spurious signals such as low pressure, low reactor water level, low condenser vacuum, etc.; and finally, equipment malfunctions such as faulty valves or operating mechanisms. A closure of one MSIV may cause an immediate closure of all the other MSIV's depending on reactor conditions. If this occurs, it is also included in this category. During the main steam isolation valve closure, position switches on the valves provide a reactor scram if the valves in three or more main steamlines are less than 90% open (except for interlocks which permit proper plant startup). Protection system logic, however, permits the test closure of one valve without initiating scram from the position switches.

For the condition of one MSIV closing. One MSIV may be closed at a time for testing purposes, this is done manually. Operator error or equipment malfunction may cause a single MSIV to be closed inadvertently. If reactor power is greater than about 75% when this occurs, an APRM high flux scram or high steamline isolation scram may result, (if all MSIV's close as a result of the single closure, the event is included in the frequency group of the preceding paragraph.

15.2.4.2 Sequence of Events and Systems Operation

The sequence of events for the closure of all MSIV's (Figure 15.2.4-1) is as follows:

Time (sec)	Event
0	Initiate closure of all main steamline isolation valves (MSIV).
0.3	MSIV's reach 90% open.
0.3	MSIV position trip scram initiated.

1.6	Loss of feedwater begins as turbine lose steam supply.
2.42, 2.51, 2.60, 2.70 and 2.80	Relief valves actuated by groups 1, 2, 3, 4, and 5.
3.0	All main steamline isolation valves closed.
4.47	Recirculation runback on low level alarm (L4) and feedwater flow < 20%.
Est. 6, 9, 7.3 7.6, 7.9 and 8.8	Relief valves reclose by groups 5, 4, 3, 2, and 1.
10.35	Group 1 relief valves reactuate on high pressure.
10.90	Group 2 relief valves reactuate on high pressure.
Est. 15.9, 17.2	Relief valves reclose by groups 2, and 1.
18.7	Vessel water low level trip (L2) initiates recirculation pump trip. Vessel water low level trip (L2) initiates RCIC & HPCS (not simulated).
20.84	Group 1 relief valves cycle open and closed on pressure.

As all main steam isolation valves close, position switches on these valves initiate a reactor scram when the valves in three or more main steamlines are less than 90% open. This scram signal requires that the reactor pressure is above the reactor scram pressure setpoint and that the reactor mode switch is in the RUN position. Credit is taken for successful operation of the reactor protection system. Normal operation of the pressure relief system logic which initiates the opening of relief valves is also assumed during the time period covered by the analysis. All plant control systems maintain normal operation unless specifically designated to the contrary.

For the closure of a single MSIV, that action will not initiate a reactor scram because the valve position trip logic is designed to accommodate single MSIV closure during operation at limited power levels. The main steamlines are sized to carry full rated steam flow with one line closed. MSIV testability during normal reactor operation is possible. Credit is taken for the operation of the pressure signals of the NSSS and the flux signals of the reactor protection systems to initiate reactor scram. All plant control systems are assumed to operate normally unless designated to the contrary.

Operator actions should assure that a normal shutdown occurs and that adequate core coverage is maintained for cooling requirements. Other than assurance of adequate reactor pressure relief and requisite cooling following shutdown, there are no safety actions required by the operator.

Consideration of single failures and operator errors shows that mitigation of pressure rise is accomplished by MSIV position switch initiation of reactor scram followed by reactor protection system shutdown of the reactor. Relief valves also operate to limit vessel pressure. Each of these aspects of safety control is designed to single failure criteria and, in this case, additional failures would not alter the results of the analysis. Failure of a single relief valve to open is not expected to have any significant effect because less than 20 psi increase in vessel pressure would occur. The peak pressure is still considerably less than the 1375 psig pressure limit.

15.2.4.3 Core and System Performance

Mathematical Model

An extensive nonlinear dynamic model is employed in the transient analyses. The model is described in Reference 1.

Input Parameters and Initial Conditions

The reactor is initially operating at 105% of NB rated power with a vessel dome pressure of 1020 psig. Other plant parameters are as shown in Table 15.0-2.

The assumptions and conditions are as follows:

a. Automatic circuitry or operator action initiates closure of the main steamline isolation valve(s) which in turn initiates the transient.

b. The main steam isolation valves close in 3 to 5 seconds. The worst case, the 3-second closure time, is assumed for the analysis shown here.

c. Position switches on the valves initiate a reactor scram when the valves are less than 90% open. Closure of these valves inhibits steam flow to the feedwater turbines terminating feedwater flow.

d. Valve closure indirectly causes a trip of the main turbine and generator.

e. Because of the loss of feedwater flow, water level within the vessel decreases sufficiently to initiate trip of the recirculation pump and initiate the HPCS and RCIC systems.

Results

For closure of all MSIV's, Figure 15.2.4-1 shows the changes in important nuclear system variables following simultaneous isolation while the reactor is operating at 105% of NBR steam flow. Peak neutron flux reaches 269% of NBR power flux at approximately 2 seconds. At this time, the nonlinear valve closure characteristic exerts a dominating effect and the assumed conservative scram characteristic has not yet allowed credit for full shutdown of the reactor. No significant increase in fuel surface heat flux nor reduction in MCPR occurs. Water level decreases sufficiently to cause a recirculation pump trip with accompanying initiation of the HPCS and RCIC systems at approximately 18 seconds. However, there is a delay of up to 30 seconds before water supply enters the vessel. There is no change in the thermal margins during the transient.

The nuclear system relief valves begin to open automatically at approximately 2.4 seconds after the isolation is initiated. The valves close sequentially as the stored heat is dissipated and will continue intermittently to discharge steam from decay heat. The peak pressure in the main steamline is 1152 psig. Peak pressure at vessel bottom is 1199 psig, clearly below the pressure limits of the reactor coolant pressure boundary.

For closure of only one MSIV (such as is permitted for testing purposes), the normal test requirements limit the reactor power to approximately 67%* of design conditions to preclude a high flux scram, high pressure scram or complete MSIV isolation of all main steamlines. Only one MSIV is permitted to be closed at a time for testing purposes; this testing mode precludes a reactor scram from the MSIV closure switches on the valve undergoing test.

Inadvertent closure in 3 seconds of an MSIV during 105% NBR steam flow results in flow disturbances sufficient to raise vessel pressure and reactor power enough to cause an APRM high neutron flux scram. No quantitative results are shown for this event because no significant effect is imposed on the reactor coolant pressure boundary. System pressure is regulated via the main turbine bypass system for the other three steamlines.

Inadvertent closure of one or all MSIV's while the reactor is shutdown (such as operating State C, as defined in Appendix D) will produce no significant transient. MSIV closure during plant heatup (operating State D) will be less severe than for the maximum power cases discussed above.

Considerations for uncertainties in the analyses are included in the reactor protection system settings, system capacities, and system response characteristics. In all cases, the most conservative values were used, for example: the slowest allowable control rod motion, the scram worth curve for an all-rods-out condition, minimum valve capacities for overpressure protection, action points on the relief valves were taken at 115% of the nominal setpoint.

*Actual value to be determined during Startup Test Program.

15.2.4.4 Barrier Performance

The consequences of MSIV closure, whether involving all MSIV's or a single MSIV, do not result in any temperatures nor pressures in excess of the criteria for which the fuel clad, pressure vessel, or containment are designed; therefore, these barriers maintain their safety integrity.

The activity released to the suppression pool via the relief valves' discharge is activity in the reactor coolant.

15.2.4.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release conditions. If purging of the containment is chosen, the release will be done in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

15.2.4.6 References

1. R. Linford, "Analytical Methods of Plant Transient Evaluations for the General Electric Boiling Water Reactor," NEDO-10802, April 1973.

TABLE 15.2.4-1

SUMMARY OF ACTIVITY ABOVE SUPPRESSION POOL

RESULTING FROM ISOLATION SCRAM

NUCLIDE*	ACTIVITY IN CURIES			
	Time after Isolation Scram			
	4 minutes	4 hours	8 hours	16 hours
Kr^{83m}	6.9×10^{0}	5.9×10^{1}	1.4×10^{1}	7.3×10^{-1}
Kr^{85m}	1.5×10^{1}	1.4×10^{2}	7.7×10^{1}	2.3×10^{1}
Kr^{85}	2.7×10^{-2}	5.3×10^{-1}	5.4×10^{-1}	5.7×10^{-1}
Kr^{87}	2.5×10^{1}	5.0×10^{1}	5.7×10^{0}	7.5×10^{-2}
Kr^{88}	4.2×10^{1}	2.7×10^{2}	1.0×10^{2}	1.5×10^{1}
Rb^{88}	2.3×10^{0}	2.8×10^{2}	1.1×10^{2}	1.6×10^{1}
Kr^{89}	5.0×10^{0}	---	---	--
Rb^{89}	4.2×10^{-1}	---	---	---
Kr^{90}	1.7×10^{-2}	---	---	---
Rb^{90}	3.2×10^{-2}	---	---	---
I^{131}	4.8×10^{-5}	7.0×10^{-2}	7.3×10^{-2}	7.1×10^{-2}
Xe^{131m}	2.1×10^{-1}	3.7×10^{0}	3.7×10^{0}	3.8×10^{0}
I^{132}	8.8×10^{-5}	3.7×10^{-1}	1.9×10^{-1}	1.1×10^{-1}
I^{133}	8.7×10^{-5}	7.2×10^{-2}	6.5×10^{-2}	5.0×10^{-2}
Xe^{133m}	1.8×10^{0}	3.1×10^{1}	3.0×10^{1}	2.8×10^{1}
Xe^{133}	8.1×10^{1}	1.4×10^{3}	1.4×10^{3}	1.4×10^{3}
I^{134}	4.5×10^{-4}	4.1×10^{-2}	1.8×10^{-3}	3.3×10^{-6}
I^{135}	1.5×10^{-4}	5.0×10^{-2}	3.4×10^{-2}	1.5×10^{-2}
Xe^{135m}	1.3×10^{1}	3.2×10^{1}	2.3×10^{-2}	9.7×10^{-3}
Xe^{135}	3.2×10^{1}	6.4×10^{2}	4.8×10^{2}	2.8×10^{2}
Xe^{137}	9.0×10^{0}	---	---	---
Xe^{138}	3.3×10^{1}	5.4×10^{-3}	---	---
Cs^{138}	1.1×10^{0}	7.5×10^{-1}	4.3×10^{-3}	---
Xe^{139}	5.8×10^{-2}	---	---	---
TOTAL	2.7×10^{2}	2.9×10^{3}	2.2×10^{3}	1.8×10^{3}

*This is a selected list of significant nuclides only.

TABLE 15.2.4-2

RADIOLOGICAL EFFECT - MSIV CLOSURE

			10 CFR 100		CONSERVATIVE	
			(2 hours)	(30 days)	(2 hours)	(30 days)
A.	Exclusion Boundary (509 meters)	Whole Body Dose (rem)	25	N/A	3.9E-07	--
		Thyroid Dose (rem)	300	N/A	6.9E-08	--
B.	Point of Interest (915 meters)	Whole Body Dose (rem)	N/A	N/A	--	--
		Thyroid Dose (rem)	N/A	N/A	--	--
C.	Low Population Zone (6400 meters)	Whole Body Dose (rem)	N/A	25	N/A	3.1E-07
		Thyroid Dose (rem)	N/A	300	N/A	3.1E-07

TABLE 15.2.4-3

INADVERTENT MSIV CLOSURE

(REALISTIC ANALYSIS)

ACTIVITY RELEASED TO THE ENVIRONMENT (curies)

I-131	7.3E-03
I-132	1.9E-02
I-133	6.5E-03
I-134	1.8E-04
I-135	3.4E-03
Total	3.6E-02
Kr-83m	2.8E 01
Kr-85m	1.5E 02
Kr-85	1.1E 00
Kr-87	1.1E 01
Kr-88	2.0E 02
Kr-89	0.
Xe-131m	7.4E 00
Xe-133m	6.0E 01
Xe-133	2.8E 03
Xe-135m	4.6E-02
Xe-135	9.6E 02
Xe-137	0.
Xe-138	0.
Total	4.2E 03

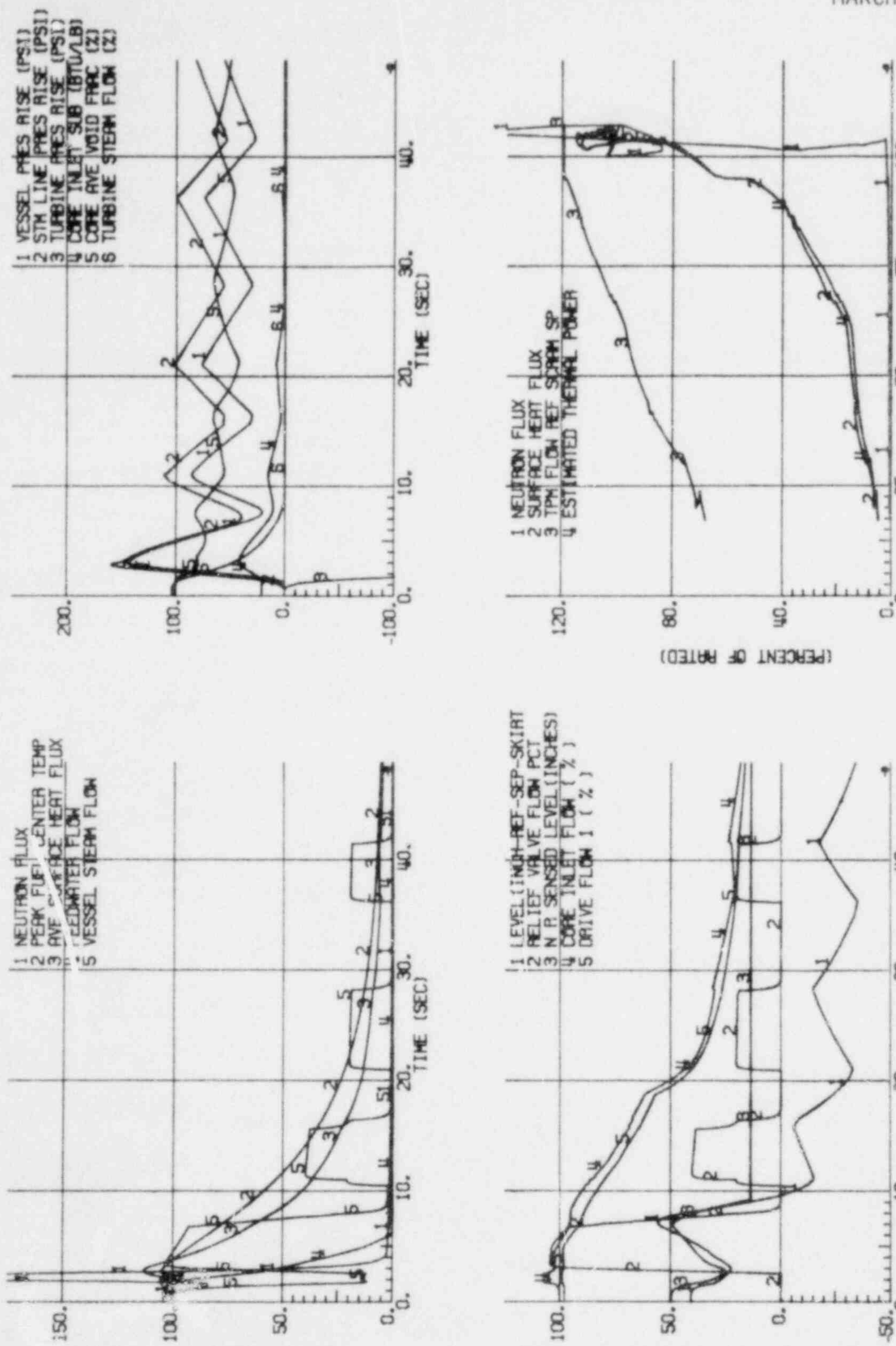

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FIGURE 15.2.4-1

3-SECOND CLOSURE OF ALL MSIV'S
105% POWER

15.2.5 Loss of Condenser Vacuum

15.2.5.1 Identification of Causes and Frequency Classification

Various system malfunctions which can cause a loss of condenser vacuum due to some single equipment failure are shown below with their estimated vacuum decay rates:

CAUSE	ESTIMATED DECAY RATE
Failure or isolation of steam jet air ejectors	< 1 inch Hg/min.
Loss of sealing steam to shaft gland seals	1 to 2 inches Hg/min.
Opening of vacuum breaker valves	2 to 12 inches Hg/min.
Loss of one or more circulating water pumps	4 to 24 inches Hg/min.

This event is categorized as an incident of moderate frequency.

15.2.5.2 Sequence of Events and Systems Operation

The sequence of events for loss of condenser vacuum (Figure 15.2.5-1) is as follows:

Time (sec)	Event
0	Initiate simulated loss of condenser vacuum at 2 inches Hg/sec.
5.00	Low condenser vacuum main turbine trip initiated.
	Turbine trip initiates feedwater trip.
	Main turbine trip initiates turbine bypass valve operation.
5.01	Main turbine stop valves reach 90% open position and initiate reactor scram trip and recirculation pump trip. (RPT)
	Turbine stop valves closed and turbine bypass valves start to open to regulate pressure.

5.14	Recirculation pump motor circuit breakers open causing decrease in core flow to natural circulation.
6.65, 6.81, 6.98 and 7.18	Relief valves automatically actuate by Groups 1, 2, 3, and 4.
10.00	Low condenser vacuum initiates turbine bypass valve closure and main streamline isolation valve closure.
Est. 10.3	Turbine bypass valve(s) close.
Est. 11.0, 11.3, 11.9 and 12.7	Relief valves reclose by Groups 4, 3, 2, and 1.
13.42 and 13.85	Pressure relief valves reopen by Groups 1 and 2.
Est. 20.1	Group 2 relief valve closes.
Est. 23.8	Low vessel level (L2) trip initiates RCIC and HPCS (not simulated)
Est. 32.2	Group 1 relief valve closes.
40.85	Group 1 relief valves cycle open and closed on pressure.

In establishing the expected sequence of events to simulate plant performance, it was assumed that normal functioning occurred in plant instrumentation and controls, plant protection systems and in the reactor protection systems. The trip signals associated with loss of vacuum at the condenser originate from sensors at the following levels of vacuum.

Vacuum (in Hg)	Action Initiated
27 to 30	Normal vacuum range.
20-23	Main turbine trip and feed-water turbine(s) trip via turbine stop valve closures.
7-10	MSIV closure and turbine bypass valve(s) closure.

This event does not lead to a general increase in reactor power level. Curtailment of power increase is accomplished by the reactor scram from the main turbine stop valve position switches. This turbine stop valve scram trip signal is automatically bypassed whenever the reactor is below 30% NBR power level; the main turbine steam bypass valves are able to divert steam to the main condenser for this condition.

Operator actions are basically the minitoring of a normal reactor shutdown: verify transfer to incoming power bus; monitor water level in the vessel, observe coastdown, monitor reactor shutdown, initiate essential cooling, monitor vessel pressure.

15.2.5.3 Core and System Performance

Mathematical Model

The GE transient computer model used to simulate the transient event is the same as that described in Subsection 15.1.1.3.

Input Parameters and Initial Conditions

The analysis was performed with plant conditions tabulated in Table 15.0.1 unless otherwise noted. The turbine stop valve full-stroke closure time is 0.1 second. The simulation for a hypothetical case with a conservative 2-inches Hg/sec. vacuum decay rate. Thus, the steam bypass valves are available for several seconds because the bypass signal occurs at a vacuum level of about 10 inches Hg ahead of the trip from the turbine stop valve(s) position switches as they close.

Results

Under this hypothetical 2 inches Hg/sec. vacuum decay condition, the turbine bypass valve and main steamline isolation valve closure would follow main turbine and feedwater turbine trips by about 5 seconds after they initiate the transient. This transient, therefore, is similar to a normal turbine trip with bypass. The effect of main steamline isolation valve closure tends to be minimal since the closure of main turbine stop valves and subsequently the bypass valves have already shutoff the main steamline flow. Figure 15.2.5-1 shows the transient expected for this event. It is assumed that the plant is initially operating at 104% of NBR steam flow conditions. Peak neutron flux reaches 151% of NBR power while average fuel surface heat flux reaches 104% of rated value. Relief valves open to limit the pressure rise, then sequentially reclose as the stored energy is dissipated. There is no significant decrease in MCPR.

Peak nuclear system pressure is 1159 psig, at the vessel bottom. Clearly, the overpressure transient is below the reactor coolant pressure boundary transient pressure limit of 1375 psig. Vessel dome pressure does not exceed 1134 psig. A comparison of these values to those for turbine trip with bypass failure, at high power shows the similarities between these two transients. The prime differences are the loss of feedwater and main steamline isolation, earlier in the event.

Consideration of uncertainties is dominated by the rate of loss of vacuum in the main turbine condenser because the protective actions are actuated at various levels of condenser vacuum. The severity of the resulting transient is dependent upon the rate at which the vacuum pressure is lost. Typical loss of vacuum due to loss of cooling water pumps or steam jet air ejector problems produces a very slow loss of vacuum rate (minutes, not seconds). Normally the condenser vacuum loss sequentially trips the main turbine and the feedwater turbines, then closes the MSIV's and the bypass valves. These major events also result in actions which include 1) reactor scram from the turbine stop valve closure and 2) opening of the turbine steam bypass valves when the main turbine trips. A faster rate of vacuum loss reduces the anticipatory action of the scram and the effectiveness of the steam bypass valves because they would close more quickly.

Other uncertainties in the simulation involve protection system settings, system capacities, and system response characteristics. In all cases, the most conservative valves were used in the analysis. For example: the slowest allowable control rod motion for scram, the all-rods out condition for the scram worth curve, minimum valve capacities for overpressure protection, upper tech spec limits on relief valve settings, etc., are utilized in the simulation. Neither the HPCS nor RCIC system was included in this transient.

15.2.5.4 Barrier Performance

The consequences of loss of condenser vacuum, at the postulated maximum rate, do not result in any temperatures nor pressures in excess of the criteria for which the fuel clad, pressure vessel, or containment are designed; therefore, these barriers maintain their safety integrity.

15.2.5.5 Radiological Consequences

While the consequence of this event does not result in fuel failures, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release conditions. If purging of the containment is chosen, the release will be in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

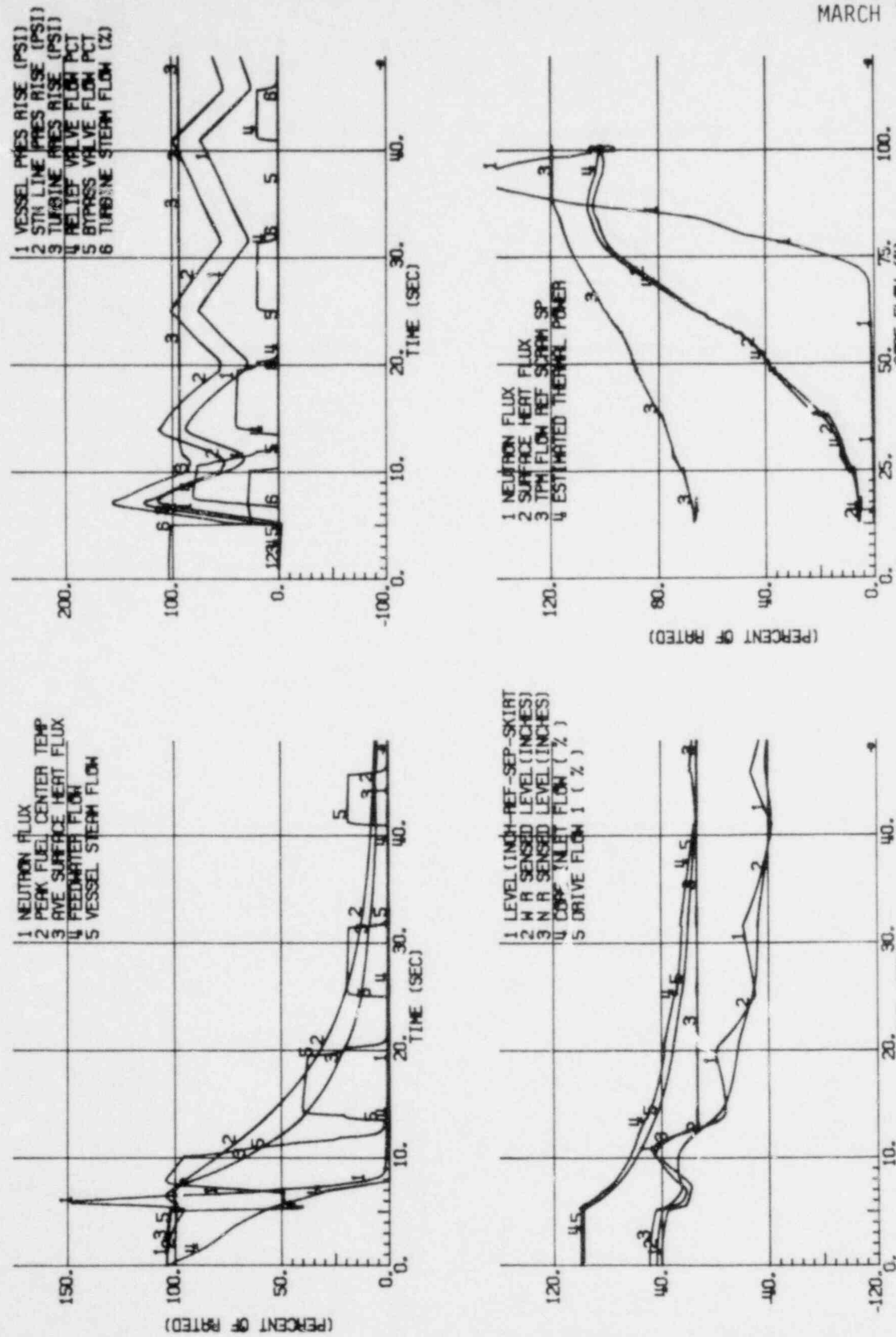

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FIGURE 15.2.5-1

LOSS OF CONDENSER VACUUM AT 2 INCHES PER SECOND
105% POWER, 100% FLOW

15.2.6 Loss of A-C Power

15.2.6.1 Identification of Causes and Frequency Classification

This initiating event is caused by either a loss of both the unit auxiliary and the system auxiliary power transformers or a loss of all grid connections.

a. Causes for interruption or loss of the system auxiliary power transformer can arise from operation or misoperation of the transformer protective circuity due to internal or external electrical faults or from operator error such as tripping the transformer high voltage breakers during normal operation. Causes for interruption or loss of the unit auxiliary power transformer can arise from operation or misoperation of the unit connected main generator/transformers protective circuitry due to internal or external electrical faults, a trip of the unit connected main generator or from operator error such as tripping the main generator output high voltage breakers during normal operation. Loss of both auxiliary power transformers is categorized as an incident of moderate frequency.

b. Loss of all grid connections can result from tornados, ice storms, aircraft accidents, etc., which may, on a massive scale, physically disconnect the plant from the main grid. This incident is classified as infrequent.

15.2.6.2 Sequence of Events and Systems Operation

a. The reactor is subjected to a complex sequence of events when the plant loses all auxiliary power. For the assumed loss of both auxiliary transformers (Figure 15.2.6-1), the sequence of events is as follows:

Time (sec)	Event
0	Loss of both auxiliary power transformers occurs.
	Recirculation system pump motors are tripped.
	Electric feedwater and condensate and condensate booster pumps are tripped.
	Condenser circulating water pumps are tripped.

10	Low Condenser vacuum initiates a turbine trip.
	Turbine steam bypass valves operate on turbine trip.
10.1	Reactor scram initiated when turbine stop valves reach 90% open position (switch).
	Turbine stop valves closed and turbine steam bypass valves start to open to regulate pressure.
22.7	Reactor vessel low level trip initiates HPCS and RCIC (not simulated).
22.8	Closure of MSIV's is initiated by low main steamline pressure signal.
25.9	Turbine steam bypass valves closed.
50.1	Group 1 relief valves cycle automatically to relieve pressure.

The operator may maintain reactor water level by use of the RCIC system if the (steam) turbine driven reactor feed pumps should fail. Reactor pressure can be controlled by use of the relief valves cooling can be initiated via the steam condensing mode of the RHR system. Normal monitoring, such as scram verification, diesel generator start, turbine coastdown vital load carrying by the diesel generators, and normal cooldown, are typical post-event operator actions.

b. For the loss of all grid connections (Figure 15.2.6-2), a different sequence of events ensues as follows:

Time (sec)	Event
Approx - 0.015	Loss of grid causes turbine-generator to detect a loss of electrical load.

0	Turbine trip initiated by loss of generator load.
	Turbine-generator PLU trip initiates main turbine control valve fast closure.
	Recirculation system pump motors trip off.
	Circulating water pump trip.
	Condensate and condensate booster pump trip.
	Turbine stop valve closure initiates reactor scram.
	Electric feedwater pump motor is tripped.
0.01	Turbine control valves closed.
0.10	Turbine steam bypass valves open to regulate pressure.
1.61, 1.76, 1.92, 2.12 and 2.56	Relief valves actuated sequentially by Groups 1, 2, 3, 4 and 5.
Est. 5.1, 5.4, 5.8, 6.0 and 6.9	Relief valves reclose sequentially by Groups 5, 4, 3, 2 and 1.
30	Loss of condenser vacuum initiates MSIV closure and turbine steam bypass valve(s) closure.
32.4	Reactor vessel low level 2 trip initiates HPCS and RCIC (not simulated)
50 plus	Group 1 relief valves automatically cycle to regulate pressure.

System operation in both events a and b (above) is normal, i.e., instruments and controls, plant protection circuits, and the reactor protection systems function normally. Operation of the HPCS and RCIC systems are not included in this simulated analysis. Their operation would normally occur at sometime beyond the primary concerns of fuel thermal margin and overpressure effects of this analysis.

In general, the loss of both auxiliary power transformers leads automatic transfer of associated loads to the plant generator (unit aux transformers). Should auto transfer fail, there would be a reduction in power level due to the tripping of the recirculation pumps and due to pressurization effects when the turbine trip follows the reactor scram. Additional failures of systems assumed to function to protect the reactor would not necessarily imply failures of the reactor protection system itself, but it is built to satisfy single failure criteria so no change is expected in the analyzed consequences.

15.2.6.3 Core and System Performance

Mathematical Model

The computer model described in Subsection 15.1.1.3 was used to simulate this event. Operation of the RCIC or HPCS systems was not included in this event, since their startup doesn't provide flow to the reactor in the time period of importance to this simulation.

Input parameters and plant conditions are those given in Table 15.0-1, unless specifically stated at some other value.

Results

a. For the loss of both auxiliary power transformers, Figure 15.2.6-1 shows graphically the simulated transient. The initial portions of the transient is similar to the loss-of-feedwater transient, however; the LSCS feedwater system is driven by steam for the normal code, hence the simulation is an extreme case for LSCS. Between 10 and 30 seconds a turbine trip, reactor scram, MSIV closure and turbine steam bypass valve closure all occur. There is no significant increase in fuel temperature.

b. For the loss of all grid connections the transient takes the characteristic of the response to a load rejection as discussed in Subsection 15.2.2. In this transient, the peak neutron flux reaches 150.4% NBR power while the fuel surface heat flux peaks at 101.8% of its initial value. The peak full center line temperature rises only 65° F. Peak pressure in the reactor vessel has a maximum valve of 1135 psig.

Consideration of Uncertainties

The most conservative characteristics of the protection features are assumed. Input power level was 105% NBR power for an EOC core condition. Any actual deviations in plant performance are expected to make the results of this event even less severe.

The reactor pressure increase following MSIV closure is expected to automatically actuate the safety/relief valve when their set-points are reached. Cyclic operation of these valves discharges decay heat to the suppression pool, which in turn can be cooled as necessary via the RHR cooling mode; system decay heat is the only driving force for pressure increase.

15.2.6.4 Barrier Performance

The consequences of this event do not result in any significant temperature or pressure transient in excess of the criteria for which the fuel clad, pressure vessel, or containment are designed; therefore, these barriers maintain their integrity and function as designed.

15.2.6.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release conditions. If purging of the containment is chosen, the release will be made in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

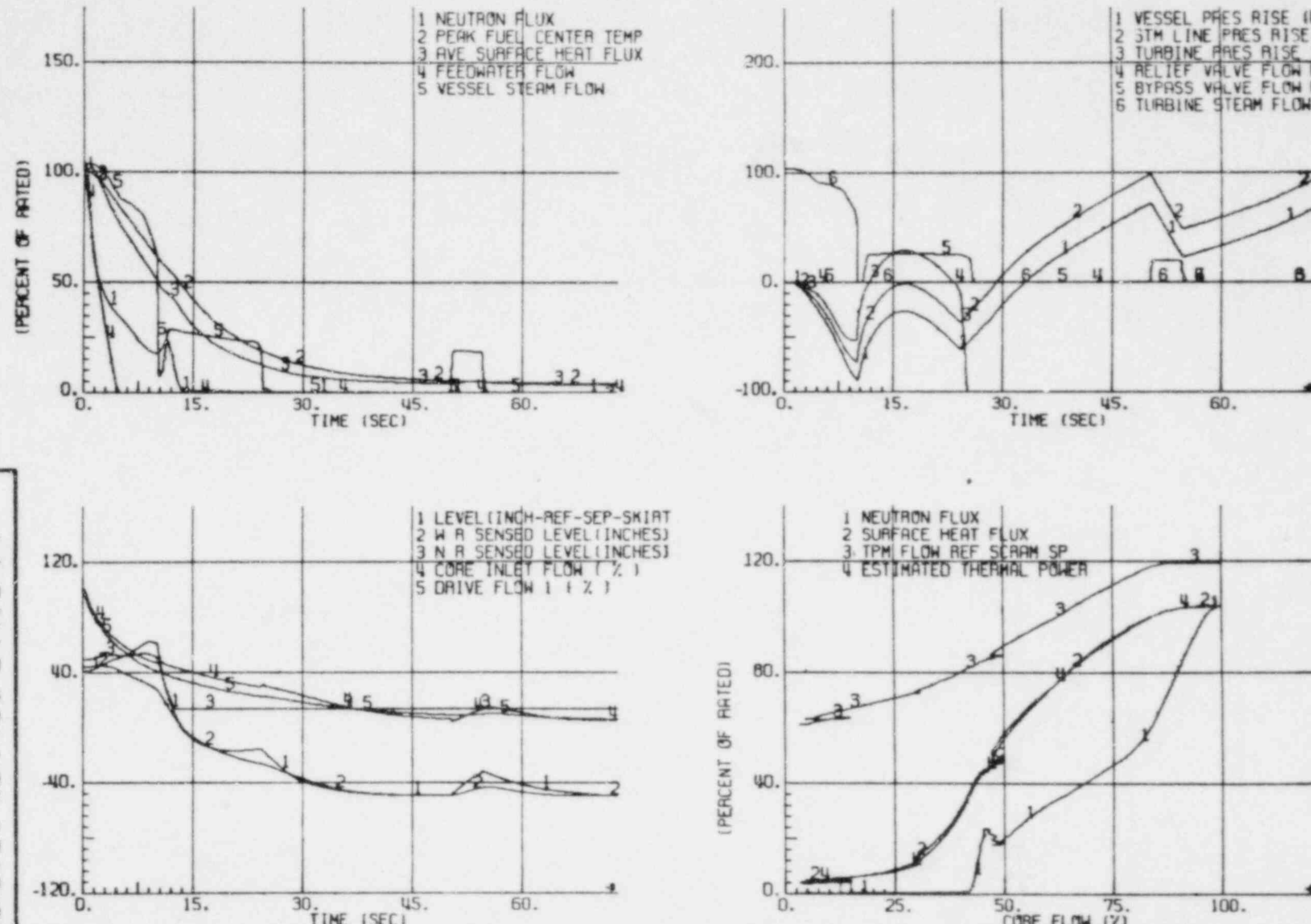

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FIGURE 15.2.6-1

LOSS OF AUXILIARY POWER TRANSFORMER

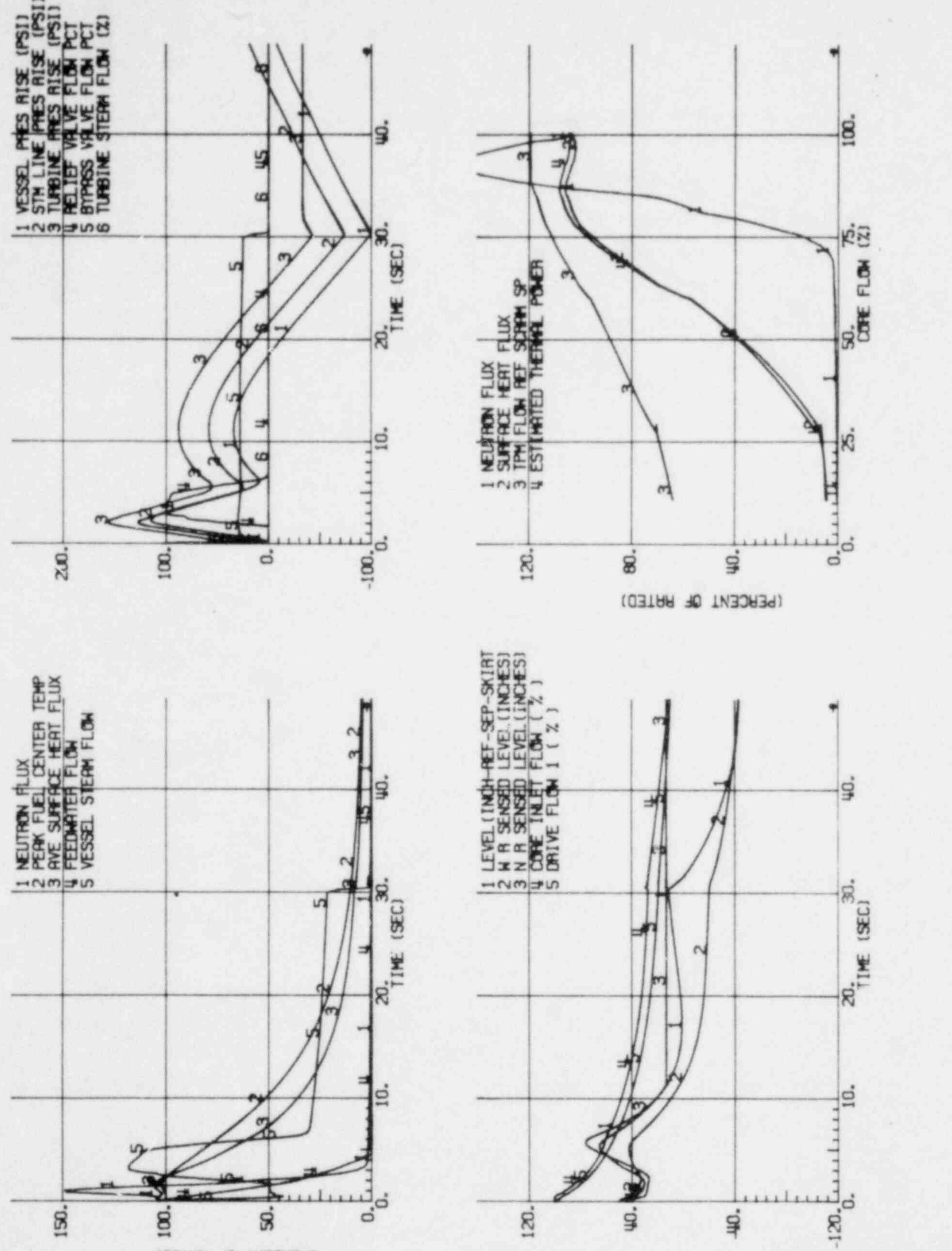

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FIGURE 15.2.6-2

LOSS OF ALL GRID CONNECTIONS
105% POWER, 100% FLOW

15.2.7 Loss of Feedwater Flow

15.2.7.1 Identification of Causes and Frequency Classification

A loss of feedwater flow can occur from pump failures, interruption of driving steam flow, feedwater controller failures, operator gross error, or erroneous input from the high vessel water level (L8) trip signal. This transient disturbance is categorized as an incident of moderate frequency.

15.2.7.2 Sequence of Events and System Operation

The sequence of events for the loss of feedwater flow incident (Figure 15.2.7-1) is as follows:

Time (sec)	Event
0	Trip initiated on feedwater pumps.
3.49	Recirculation system set-back initiated by narrow range level L4 and concurrent feedwater flow <20%.
4.48	Feedwater flow decays to zero.
7.78	Vessel water level (L3) trip initiates reactor scram.
16.99	Vessel water level (L2) trip initiates recirculation pump trip.
	Vessel water level (L2) initiates MSIV isolation.
	Vessel water level (L2) trip initiates HPCS and RCIC system operation (not simulated).
19.99	MSIV's fully closed.
30.38	Group 1 relief valves open automatically.
Est. 35.9	Group 1 relief valves close automatically.
47.46 plus	Group 1 relief valves cycle as needed to relieve pressure at a decreasing rate as decay heat diminishes.

Loss of feedwater flow results in a proportional reduction of reactor vessel inventory thus causing the vessel water level to drop. The first corrective action is a reactor scram via the low level (L3) trip actuation. The reactor protection system responds within 1 second to scram the reactor. The low level (L3) scram trip is capable to meet the single failure criterion. Containment isolation via the MSIV's also provides a follow-up scram initiation, however, the reactor is already scrammed and shut down by this time.

Credit is taken for the pressure relief valves to relieve steam pressure crreated by core decay heat because the turbine steam bypass valves are on the downstream side of the MSIV's which effect the isolation.

Key corrective functions for this event are automatic and designed to satisfy a single failure criterion; therefore, any additional failure in these shutdown methods would not aggravate or change the simulated transient.

The operator performs a monitoring function to verify the following automatic actions: All control rods inserted after the scram, MSIV closure, HPCS and RCIC initiation, self-activation of relief valves on reactor high pressure, recirculation pump trip, and normal turbine coast down. The operator may ensure water level as needed with HPCS and initiate the condensing mode of RHR cooling to complement (or take the place of) the RCIC.

Should a single relief valve fail to close after opening, the reactor will completely depressurize. This situation is discussed in Subsection 15.6.1. In that case the HPCS is capable of maintaining adequate core coverage until such time as the low pressure systems can provide long-term water inventory control.

15.2.7.3 Core and System Performance

The transient computer model described in Subsection 15.1.1.3 was used to simulate this event. Unless otherwise noted, the plant conditions tabulated in 15.0-1 were utilized.

The results of this transient simulation are shown in Figure 15.2.7-1. Feedwater flow terminates at 4.6 seconds, core subcooling decreases thus causing a reduction in power level and pressure. Water level drops until a reactor scram is initated and continues through the initiation of HPCS (and RCIC); the recirculation system is also tripped. MCPR remains considerably above the safety limit largely because heat flux increases are not experienced.

Peak pressure at the bottom of the vessel reaches 1105 psig; vessel dome pressure does not exceed 1094 psig.

This transient is most severe from high power conditions, because the rate of water level decrease is greatest and the quantity of stored and decay heat to be dissipated are highest for that power conditions.

Operation of the HPCS or the RCIC is not included in the simulation of the first 50 seconds of this transient. Later start up of these pumps has no significance with respect to thermal response of the fuel but relate only to water inventory control after system isolation.

15.2.7.4 Barrier Performance

Peak pressure in the bottom of the vessel reaches 1105 psig, which is below the ASME code limit of 1375 psig for the reactor vessel coolant pressure boundary, vessel dome pressure does not exceed 1094 psig. The consequences of this event do not result in any temperature or pressure transient in excess of the criteria for which the fuel, pressure vessel or containment are designed; therefore, these barriers maintain their integrity and function as designed.

15.2.7.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release condition. If purging of the containment is chosen the release will be in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

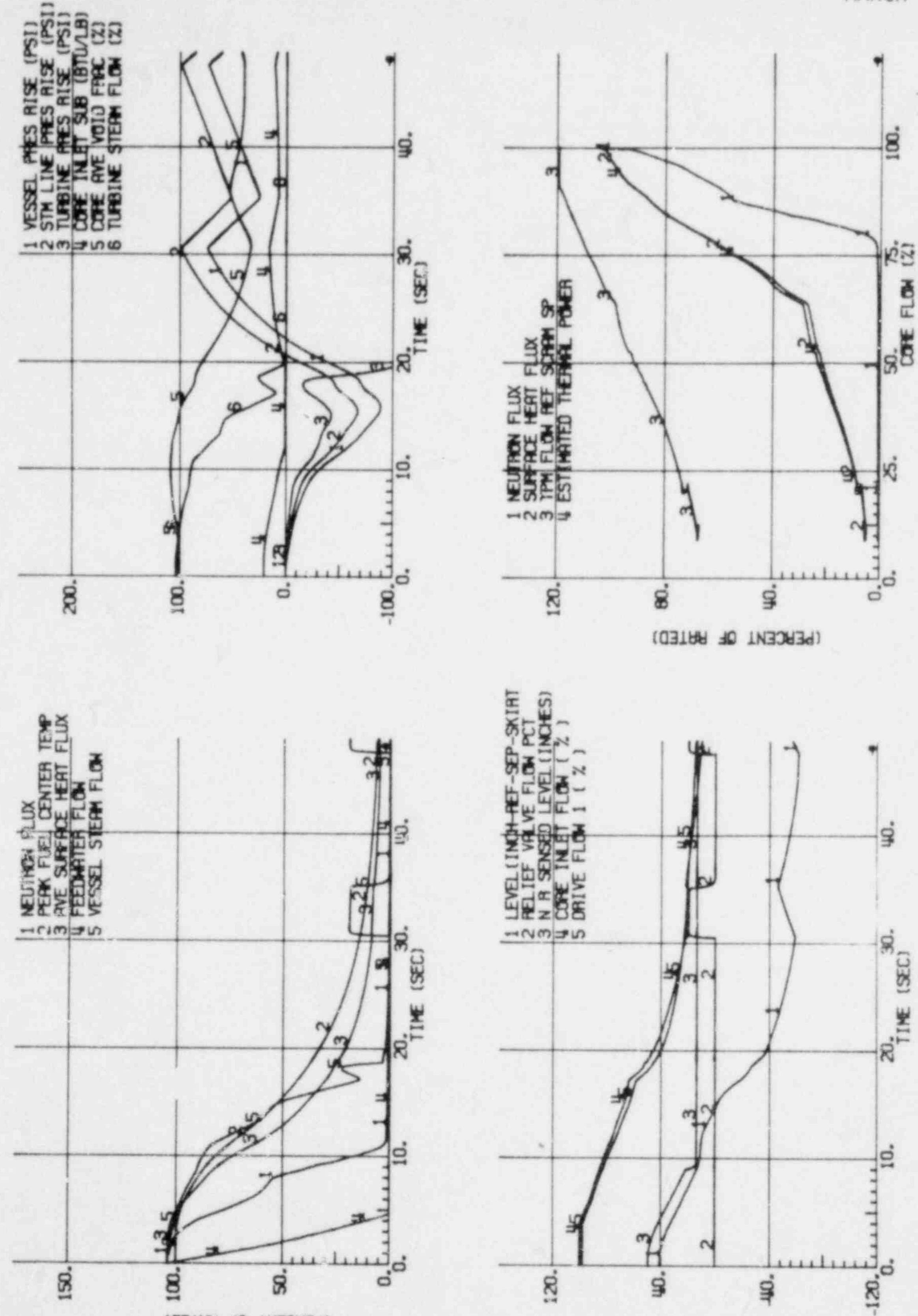

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FIGURE 15.2.7-1

LOSS OF ALL FEEDWATER FLOW
105% POWER, 100% FLOW

15.2.8 Feedwater Line Break

(Refer to Subsection 15.6.6.)

15.2.9 Failure of RHR Shutdown Cooling

Normally, in evaluating component failure considerations associated with the RHRS shutdown cooling mode operation, active pumps or instrumentation (all of which are redundant for safety system portions of the RHRS aspects) would be assumed to be the likely errant equipment. For purposes of worst-case analysis, the single recirculation loop suction valve to the redundant RHRS loops is assumed to fail. This failure would, of course, still leave two complete RHRS loops for LPCI, pool, and containment cooling minus the normal RHRS shutdown cooling loop connection. Although the errant valve could be manually manipulated open, it is assumed failed indefinitely. If it is now assumed that the single active failure criterion is applied, the plant operator has one complete RHRS loop available with the further selective worst-case assumption that the other RHRS loop is lost.

Recent analytical evaluations of this event have required additional worst-case assumptions. These included:

a. loss of all offsite a-c power,

b. utilization of safety shutdown equipment only, and

c. operator involvement only 10 minutes after coincident assumptions.

These accident-type assumptions certainly would change the intial incident (malfunction of RHRS suction valve) from a moderate frequency incident to a classification in the design-basis accident status. However, the event is evaluated as a moderate frequency event with its subsequent limits.

15.2.9.1 Identification of Causes and Frequency Classification

15.2.9.1.1 Identification of Causes

The plant is operating at 105% NBR rated steam flow when a long-term loss of offsite power occurs, causing multiple safety-relief valve actuation (see Subsection 15.2.6) and subsequent heatup of the suppression pool. Reactor vessel depressurization is initiated to bring the reactor pressure to approximately 100 psig. Concurrent with the loss of offsite power, an additional (divisional) single failure occurs which prevents the operator from establishing the normal shutdown cooling path through the RHR shutdown cooling lines. The operator then establishes a shutdown cooling path for the vessel through the ADS valves.

15.2.9.1.2 Frequency Classification

This event is evaluated as a moderate frequency event. However, for the following reasons it could be considered an infrequent incident:

a. No RHR valves have failed in the shutdown cooling mode in BWR total operating experience.

b. The set of conditions evaluated is for multiple failure as described above and is only postulated (not expected) to occur.

15.2.9.2 Sequence of Events and System Operation

15.2.9.2.1 Sequence of Events

The sequence of events for this event is shown in Table 15.2.9-1.

15.2.9.2.1.1 Identification of Operator Actions

For the early part of the transient, the operator actions are identical to those described in Subsection 15.2.6 (loss of offsite power event with isolation/scram). The operator then proceeds to do the following:

a. Within approximately 10 minutes after the isolation/scram, the operator initiates RPV shutdown depressurization at 100 F/hr by manual actuation of safety/relief valves.

b. At approximately 15 minutes into the transient, intitiate suppression pool cooling (again for purposes of this analysis, "worst case," it is assumed that only one RHR heat exchanger is available).

c. After the RPV is depressurized to approximately 100 psig, the operator attempts to open one of the two RHR shutdown cooling suction valves (these attempts are assumed unsuccessful).

d. The operator then actuates (opens) ADS relief valves to complete blowdown and floods the reactor vessel to establish a closed cooling path as described in the notes for Figure 15.2.9-1.

15.2.9.2.2 System Operation

Plant instrumentation and control is assumed to be functioning normally except as noted. In this evaluation credit is taken for the plant and reactor protection systems and/or the ESF utilized.

15.2.9.2.3 Effect of Single Failures and Operator Errors

The worst-case single failure (loss of division power) has already been analyzed in this event. No single failure or operator error can make the consequences of this event any worse.

15.2.9.3 Core and System Performance

15.2.9.3.1 Methods, Assumptions, and Conditions

An event that can directly cause reactor vessel water temperature increase is one in which the energy removal rate is less than the decay heat rate. The applicable event is loss of RHR shutdown cooling. This event can occur only during the low pressure portion of a normal reactor shutdown and cooldown when the RHR system is operating in the shutdown cooling mode. During this time, MCPR remains high and nucleate boiling heat transfer is not exceeded at any time. Therefore, the core thermal safety margin remains essentially unchanged. The 10-minute time period assumed for operator action is an estimate of how long it would take the operator to initiate the necessary actions; it is not a time by which the operator must initiate action.

15.2.9.3.2 Mathematical Model

In evaluating this event, the important parameters to consider are reactor depressurization rate and suppression pool temperature. Models used for this evaluation are described in Reference 2.

15.2.9.3.3 Input Parameters and Initial Conditions

Table 15.2.9-2 shows the input parameters and initial conditions used in evaluation of this event.

15.2.9.3.4 Results

For most single failures that could result in loss of shutdown cooling, no unique safety actions are required. In these cases, shutdown cooling is simply reestablished using other, normal shutdown cooling equipment. In cases where both of the RHRS shutdown cooling suction valves cannot be opened, alternate paths are available to accomplish the shutdown cooling function (Figure 15.2.9-2). An evaluation has been performed assuming the worst single failure that could disable the RHRS shutdown cooling valves.

The analysis demonstrates the capability to safely transfer fission product decay heat and other residual heat from the reactor core at the rate such that specified acceptable fuel design limits and the design conditions of the reactor cooling pressure boundary are not exceeded. The evaluation assures that, for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available), the safety function can be accomplished, assuming a worst-case single failure.

The alternate cooldown path chosen to accomplish the shutdown cooling function utilizes the RHR and ADS or normal relief valve systems (see Reference 1 and Figure 15.2.9-1).

The alternate shutdown systems are capable of performing the function of transferring heat from the reactor to the environment using only safety grade systems. Even if it is additionally postulated that all of the ADS or relief valves discharge piping also fails, the shutdown cooling function would eventually be accomplished as the cooling water would run directly out of the ADS or safety/relief valves, flooding into the drywell.

The systems have suitable redundancy in components such that, for onsite electrical power operation (assuming offsite power is not available) and for offsite electrical power operation (assuming onsite power is also not available), the system's safety function can be accomplished assuming an additional single failure. The systems can be fully operated from the main control room.

The design evaluation is divided into two phases:

a. full power operation to approximately 100 psig vessel pressure, and

b. approximately 100 psig vessel pressure to cold shutdown (14.7 psia 200 F) conditions.

15.2.9.3.4.1 <u>Full Power to Approximately 100 psig</u>

Independent of the event that initiated plant shutdown (whether it be a normal plant shutdown or a forced plant shutdown), the reactor is normally brought to approximately 100 psig using either the main condenser or, in the case where the main condenser is unavailable, the RCIC/HPCS systems, together with the nuclear boiler pressure relief system.

For evaluation purposes, however, it is assumed that the plant shutdown is initiated by a transient event (loss of offsite power), which results in reactor isolation and subsequent relief valve actuation and suppresssion pool heatup. For this postulated condition, the reactor is shut down and the reactor vessel pressure and temperature are reduced to and maintained at saturated conditions at approximately 100 psig. The reactor vessel is depressurized by manually opening selected safety/relief valves. Reactor vessel makeup water is automatically provided via the RCIC/HPCS systems. While in this condition, the RHR system (suppression pool cooling mode) is used to maintain the suppression pool temperature within shutdown limits.

These systems are designed to routinely perform their functions for both normal and forced plant shutdown. Since the RCIC, HPCS, and RHR systems are divisionally separated, no single failure, together with the loss of offsite power, is capable of preventing reaching the 100 psig level.

15.2.9.3.4.2 Approximately 100 psig to Cold Shutdown

The following assumptions are used for the analyses of the procedures for attaining cold shutdown from a pressure of approximately 100 psig:

a. the vessel is at 100 psig and saturated conditions;

b. a worst-case single failure is assumed to have occurred (i.e., loss of a division of emergency power); and

c. there is no offsite power available.

In the event that the RHR's shutdown suction line is not available because of single failure, the first action to be taken will be for personnel to gain access and attempt to effect repairs. For example, if a single electrical failure caused the suction valve to fail in the closed position, a hand wheel is provided on the valve to allow manual operation. If for some reason the normal shutdown cooling suction line cannot be repaired, the capabilities described below will satisfy the normal shutdown cooling requirements and thus fully comply with General Design Criterion 34.

The RHR shutdown cooling line valves are in two divisions (Division 1 equals the outboard valve, and Division 2 equals the inboard valve) to satisfy containment isolation criteria. For evaluation purposes, the worst-case failure is assumed to be the loss of a division of emergency power, since this also prevents actuation of one shutdown cooling line valve. Engineered safety feature equipment available for accomplishing the shutdown cooling function includes (for the selected path):

a. ADS (DC Division 1 and DC Division 2),

b. RHR Loop (A) Division 1),

c. HPCS (Division 3),

d. RCIC (DC Division 1), and

e. LPCS (Division 1).

Since availability or failure of Division 3 equipment does not effect the normal shutdown mode, normal shutdown cooling is easily available through equipment powered from only Divisions 1 and 2. It should be noted that, conversely, the HPCS system is always available for cooling injections if either of the other two divisions fails. For failure of Divisions 1 or 2, the following systems are assumed functional:

a. Division 1 Fails, Division 2 and 3 Functional:

Failed Systems	Functional Systems
RHR Loop (A)	HPCS
LPCS	ADS
	RHR Loops B and C
	RCIC

Assuming the single failure is a failure of Division 1 emergency power, the safety function is accomplished by establishing one of the cooling loops described in Activity C1 of Figure 15.2.9-1.

b. Division 2 Fails, Divisions 1 and 3 Functional:

Failed Systems	Functional Systems
RHR Loops B and C	HPCS
	ADS
	RHR Loop A
	RCIC
	LPCS

Assuming the single failure is the failure of Division 2, the safety function is accomplished by establishing one of the cooling loops described in Activity C2 of Figure 15.2.9-1. Figures 15.2.9-5 through 15.2.9-8 show RHR loops A, B and/or C (simplified).

Using the above assumptions and following the depressurization transient shown in Figures 15.2.9-3a or 3b, the suppression pool temperature is shown in Figures 15.2.9-4a or 4b.

15.2.9.4 Barrier Performance

As noted above, the consequences of this event do not result in any temperature or pressure transient in excess of the criteria for which the fuel, pressure vessel, or containment are designed. Release of coolant to the containment occurs via SRV actuation. Release of radiation to the environment is described below.

15.2.9.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal cooling activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposures to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release conditions. If purging of the containment is chosen, the release will have to be in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

15.2.9.6 References

1. Letter from R. S. Boyd to I. F. Stuart dated November 12, 1975, Subject: Requirements Delineated for RHRS - Shutdown Cooling System--Single Failure Analysis.

2. T. Y. Fukushima, "HEX01 User Manual," NEDE-23014, July 1976.

TABLE 15.2.9-1

SEQUENCE OF EVENTS FOR FAILURE OF RHR SHUTDOWN COOLING

APPROXIMATE ELAPSED TIME	EVENT
0	Reactor is operating at 105% NBR steam flow when LOP transient occurs initiating plant shutdown.
0	Concurrently loss of Division power (i.e., loss of one diesel generator) occurs.
10 minutes	Controlled depressurization initiated (100°F/hr) using selected safety/relief valves.
15 minutes	Suppression pool cooling initiated to prevent overheating from SRV actuation.
111 minutes	Blowdown to approximately 100 psi completed.
111 minutes	Personnel are sent in to open RHR shutdown cooling suction valve; this fails.
141 minutes	ADS valves are opened to complete blowdown to suppression pool, and RHR pump discharge is redirected from pool to vessel via LPCI line. Alternate shutdown cooling path has now been established.

TABLE 15.2.9-2

INPUT PARAMETERS FOR EVALUATION OF FAILURE OF RHR

SHUTDOWN COOLING

Initial power corresponding to	105% rated steam flow
Suppression pool mass (lb_m)	8.52×10^6
RHR (KHX value)(Btu/sec/°F)	385
Initial vessel condition:	
Pressure (psia)	1055
Temperature (°F)	550.7
Initial primary fluid inventory (lb_m)	7.016×10^5
Initial pool temperature, (°F)	100
Service water temperature, (°F)	100
Vessel heat capacity (Btu/lb_m/°F)	0.123
HPCS on - off water level (ft) on	40.8
off	47
HPCS flow rate, lb_m/sec	868
LPCI flow rate, lb_m/sec	982

15.3.3 Recirculation Pump Seizure

15.3.3.1 Identification of Causes and Frequency Classification

The postulated recirculation pump seizure represents an extremely unlikely event of instantaneous stoppage of the pump-motor shaft of one recirculation pump. This produces a very rapid decrease of core flows as a result of the large hydraulic resistance introduced by the stopped rotor.

A recirculation pump seizure is categorized as an event of limiting fault frequency, an accident in other words. Actual data are not available for this postulated event.

15.3.3.2 Sequence of Events and Systems Operation

The sequence of events for this hypothetical incident (Figure 15.3.3-1) is as follows:

Time (sec)	Event
0	Single pump seizure was initiated.
0.58	Jet pump diffuser flow reverses in seized loop.
3.58	High vessel water level (L8) trip initiates main turbine trip.
	High vessel water level (L8) trip initiates feedwater turbine trip.
	Main turbine trip initiates bypass operation.
3.59	Main turbine stop valves reach 90% open position and initiate reactor scram trip and recirculation pump trip (RPT).
3.68	Turbine stop valves closed and turbine bypass valves start to open to regulate pressure.
3.72	Recirculation pump motor circuit breakers open causing decrease in core flow to natural circulation.
6.31 and 6.72	Relief Valves actuated by Groups 1 and 2.

Est 10.8 and 11.9	Relief Valves close by Groups 2 and 1.
Est 28.8	Turbine bypass valves start to close.
30.18	Turbine bypass valves closed.
37.79	Turbine bypass valves reopen on pressure increase.
38.17	Low level trip (L2) initiates MSIV closure. Low level trip (L2) initiates RCIC and HPCS (not simulated).
40.51	Turbine bypass valves closed.
41.17	MSIV's closed.

The simulation of the expected sequence of events relied upon normal functioning of plant instruments and controls of the plant protection equipment, and of the reactor protection systems. Operation of RCIC and HPCS systems, though not included in the simulation are expected to be utilized normally. Their use maintains adequate water level which is not a problem for this event. In fact, the reactor scrams from a turbine trip which is caused by water level swell (L8).

No operator actions are required, however, the operator can regain control of reactor water level through RCIC operation or via restart of the motor driven feedwater pump. Normally the operator would ascertain that the reactor scrams from the L8 trip and that coastdown is normal with pressure controlled via ADS if needed.

Single failures in the scram logic originated via the high water level trip (L8) are the same as explained in Subsection 15.3.1.2, trip of two recirculation pumps.

15.3.3.3 Core Performance

This transient event is assumed to occur as a consequence of an unspecified, instantaneous stoppage of one recirculation pump shaft while the reactor is operating at 104% NBR power. The reactor is assumed to be operating at thermally limiting conditions. The void coefficient is adjusted to the most conservative valve, i.e., the least negative valve in Table 15.0.2.

Mathematical Model

The nonlinear dynamic model described briefly in Section 15.1.1.3 was used to simulate this event.

Input Parameters & Initial Conditions

Unless otherwise noted, the analyses was performed with plant conditions shown in Table 15.0.2.

Results

Core coolant flow drops rapidly upon abrupt stoppage of a recirculation pump; it reaches a minimum value of 51.6% flow at about 1.1 second. Natural circulation is then established. The water level swell produces a trip of both the main turbine and the feedwater turbines; this in turn initiates a turbine stop valve (closure) scram and a recirculation pump trip. After the recirculation pump trip, MCPR decreases by an insignificant amount before the fuel surface heat flux begins to drop, thus restoring a greater thermal margin. The turbine trip, which occurs after the time interval in which MCPR decreased, does not significantly retard the decrease in heat flux. Therefore, there is no threat to fuel thermal limits and the design basis is satisified.

Considerations of uncertainties are included in the GETAB analysis.

15.3.3.4 Barrier Performance

Steam flow through the turbine bypass valves and momentary opening of some of the safety/relief valves (automatically) limit the vessel pressure to acceptable values. The reactor coolant pressure boundary is not threatened by overpressure because the fuel temperature and MCPR limits are not compromised, the fuel barrier (clad) is also not threatened.

15.3.3.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposure to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release condition. If purging of the containment is chosen the release will be in accordance with established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

15.3.3.6 References

1. R. Linford, "Analytical Methods of Transient Evaluations for the General Electric Boiling Water Reactor," NEDO 10802, April 1973.

2. Letter Report, "Analysis of Recirculation Pump Under Accident Conditions," Rev. 1, May 1, 1978, from E. D. Fuller (GE) to R. C. DeYoung (NRC).

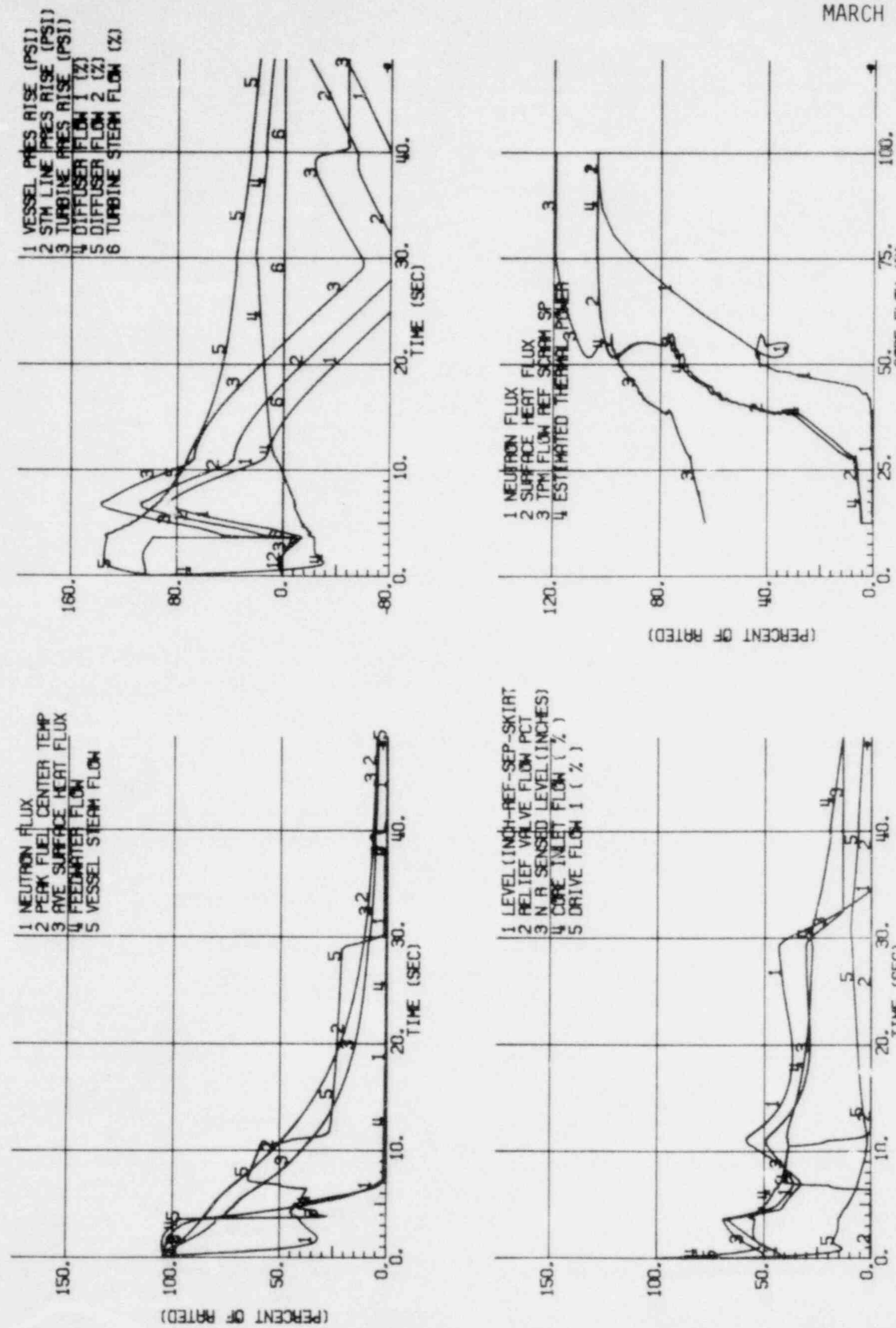

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FIGURE 15.3.3-1

SEIZURE OF ONE RECIRCULATION PUMP
105% POWER, 100% FLOW

15.6 DECREASE IN REACTOR COOLANT INVENTORY

15.6.1 Inadvertent Safety/Relief Valve Opening

15.6.1.1 Identification of Causes and Frequency Classification

The cause of an inadvertent opening of a safety/relief valve is attributed to malfunction of the valve or to the operator which controls valve opening. For a single safety/relief valve, the manual opening and closing circuitry is redundant to provide for single failure. The safety function and the relief function are separately controlled; further, by group action, the SRV's are redundant functionally and have single failure capability to perform the depressurization/safety functions.

Simply, a postulated fail open situation is analyzed here for completeness.

This transient disturbance is categorized as an infrequent event for the direct-acting Crosby SRV's used at La Salle; however, due to a lack of comprehensive data on this newly designed valve, it is being analyzed here as an incident of moderate frequency.

15.6.1.2 Sequence of Events and System Operation

The sequence of events for this postulated incident is outlined as follows:

Time (sec)	Event
0	Initiate opening of 1 safety/relief valve.
0.5 (est)	Relief valve reaches full steam flow.
15.0 (est)	Reactor/power equipment establishes a new steady state operation condition, suppression pool accepts blowdown.

The normal functioning of plant instrumentation and controls is assumed for this incident; specifically the operation of the pressure regulator and vessel level control systems is assumed normal. Failures of additional equipment such as in feedwater system, the pressure regulator, or in the recirculation system are addressed elsewhere in Chapter 15.0 accidents and in Appendix D for the relationship of system state conditions and needed actions.

For the simple failure postulated here, the plant operator must reclose the valve as quickly as possible and check that reactor and turbine-generator return to normal. If the valve cannot be closed, plant setback by manual recirculation. pump trip and feedwater setback should be initiated. The suppression pool bulk temperature should be monitored to assure that plant shutdown occurs when the suppression pool temperature setpoint is reached. Initiation of suppression pool cooling is a power generation objective as long as the suppression pool setpoint is not attained. Mandatory shutdown of the plant is necessary at and beyond that setpoint.

15.6.1.3 Core and System Performance

Mathematical Model

This event is not limiting from a core performance standpoint. A heat-balance with time-temperature output is adequate to described a bounding analysis for this event.

Input Parameters and Initial Conditions

It is assumed that the reactor is operating at an initial power level corresponding to 105% of rated steam flow conditions when a safety/relief valve opens inadvertently. Manual recirculation flow control is assumed. Discharge flow through the open valve at normal plant operating conditions is approximately 895,000 lb/hr of steam.

The eighteen SRV's at LSCS have rated steam flows which range from 862-906,000 lb/hr. Evaluation at a flow of 895,000 lb/hr provides a time-temperature response within 1 1/2% of that from the maximum possible flow condition for any of these Crosby valves at LSCS.

Results

The opening of a safety/relief valve allows steam to be discharged to the suppression pool. The sudden increase in the rate of steam flow leaving the reactor vessel causes a mild depressurization transient of brief duration. The pressure regulator senses this nuclear system pressure decrease and within a few seconds closes the turbine control valve to stabilize reactor vessel pressure at a slightly lower value. Reactor power settles very nearly at the initial power level. Thermal margin on the fuel decreases only slightly through this transient and no fuel damage results. MCPR is essentially unchanged. The safety limit margin is unaffected.

Figures 15.6.1-1 and 15.6.1-2 show the rise in suppression pool temperature for a stuck-open relief valve from high power operation and from hot standby respectively.

15.6.1.4 Barrier Performance

The transient resulting from an inadvertently opened safety/relief valve is totally within the range of normal load following by this recirculation system. The feedwater system is adequate to maintain level. Therefore, this is no significant effect on the Reactor Coolant Pressure boundary nor on the containment integrity, either by pressure or temperature.

15.6.1.5 Radiological Consequences

While the consequence of this event does not result in fuel failure, it does result in the discharge of normal coolant activity to the suppression pool via SRV operation. Since this activity is contained in the primary containment, there will be no exposures to operating personnel. Since this event does not result in an uncontrolled release to the environment, the plant operator can choose to leave the activity bottled up in the containment or discharge it to the environment under controlled meteorological and release conditions. If purging of the containment is chosen the release will be in accordance with the established technical specifications; therefore, this event, at the worst, would only result in a small increase in the yearly integrated exposure level.

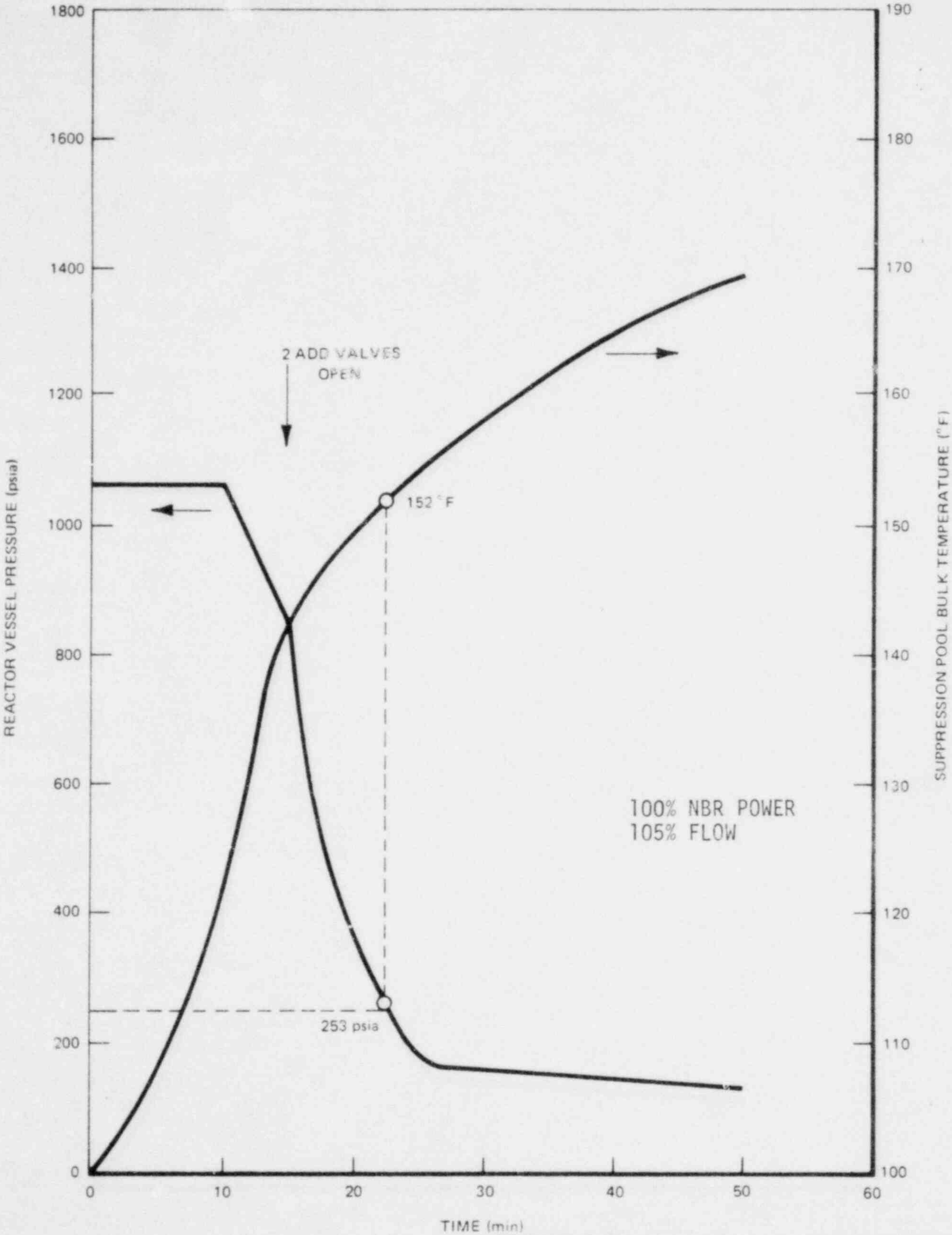

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FIGURE 15.6.1-1

SUPPRESSION POOL TEMPERATURE RESPONSE
STUCK OPEN RELIEF VALVE FROM
POWER OPERATION

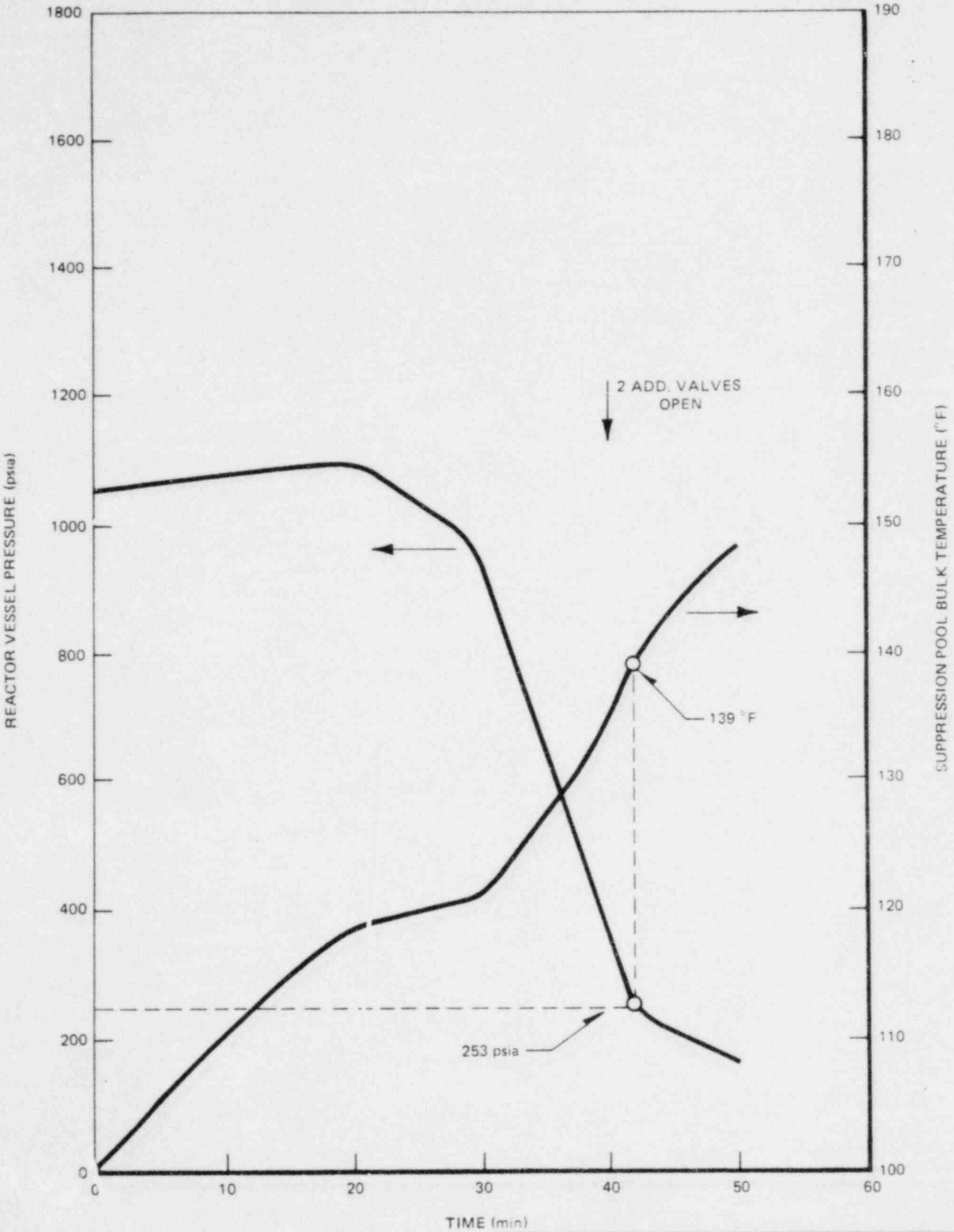

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FIGURE 15.6.1-2

SUPPRESSION POOL TEMPERATURE RESPONSE
STUCK OPEN RELIEF VALVE FROM
HOT STANDBY

15.6.2 Instrument Line Break

15.6.2.1 Identification of Causes and Frequency Classification

There is no specific event or circumstance identified which results in the failure of an instrument line. However, for the purpose of evaluating the consequences of a small line rupture, the failure of an instrument line is assumed to occur.

A circumferential rupture of an instrument line which is connected to the primary coolant system is postulated to occur outside the primary containment but inside the secondary containment. In order to consider the most severe situation, the rupture is assumed to occur in that portion of the instrument line between the primary containment and the excess flow check valve. This failure results in the release of primary system coolant to the secondary containment, until the reactor is depressurized. This event could conceivably occur in the drywell. However, the associated effects would not be as significant as those from a failure in the secondary containment. The sequence of events for this accident is as follows:

Events	Approximate Elapsed Time
1. Event begins - instrument line fails external to drywell	0
2. Identification of break	≤10 minutes
3. Operator actions begin, including initiation of reactor shutdown and SGTS operation	≤10 minutes

An instrument line break event is estimated to occur infrequently.

15.6.2.2 Sequence of Events and Systems Operation

The operator shall, if possible, isolate the affected instrument line. Depending on which line is broken, the operator shall determine whether to continue plant operation until a scheduled shutdown can be made or to proceed with an immediate, orderly plant shutdown, including initiation of SGTS.

As a result of increased radiation, temperature, humidity, fluid, and noise levels within the containment, operator action can be initiated by any one or any combination of the following signals:

a. Operator comparing readings with several instruments monitoring the same process variable such as reactor level, jet pump flow, steam flow, and steam pressure.

b. By annunciation of the control function, either high or low in the control room.

c. By a half-channel scram if rupture occurred on a reactor protection system instrument line.

d. By a general increase in the area radiation monitor readings throughout the reactor building.

e. By increases in area temperature monitor readings in the reactor building.

15.6.2.3 Core and System Performance

15.6.2.3.1 Mathematical Model

The analytical methods and associated assumptions which are used to evaluate the consequences of this accident are considered to provide a realistic, yet conservative assessment of the consequences.

The analytical techniques which are used to evaluate the consequences of this event are consistent with well-established heat transfer and mass blowdown calculational models. The instrument line is assumed to fail external to the primary containment and inside the containment, resulting in the release of primary coolant to the reactor building. In addition to the normal levels of iodine in the reactor coolant, consideration is given to additional iodine release to the primary coolant from the fuel as a consequence of reduction in power and reactor vessel pressure.

As a consequence of this accident, the reactor is scrammed and the reactor vessel cooled and depressurized over a 5-hour period. The following assumptions and conditions are the basis for the mass loss during the 5-hour period:

a. Shutdown and depressurization initiated at 10 minutes after break occurs.

b. Normal depressurization and cooldown of reactor pressure vessel.

c. Line contains a 1/4-inch diameter flow restricting orifice inside the primary containment.

d. Homogeneous critical blowdown flow model (Reference 1) is applicable and flow is critical at the orifice.

The release of primary coolant through the orificed instrument line will result in an increase in the normal secondary containment pressure and isolation of the normal ventilation system. The peak pressure reached will be governed primarily by the mass blowdown rate, coolant temperature, condensation factor, and to a lesser degree by the containment leak rate. In any event, the peak pressure will be well below the containment design pressure.

15.6.2.3.2 Input Parameters and Initial Conditions

The reactor is operating at design power conditions when a failure occurs in one of the instrument lines which is connected to the primary coolant system and penetrates the primary containment.

The radiological exposures are based on the assumption that the activity released to the containment is proportional to the mass loss. In addition to the activity contained in the coolant prior to blowdown, additional activity may be released as a consequence of reactor scram and vessel depressurization. This additional release is taken into consideration in evaluating the radiological exposures and is based on experimental data collected from BWR reactor shutdowns on similar plants (Reference 2). The peak I-131 coolant activity in the reactor water is assumed to occur at 5 hours and is equal to 9 Ci/gm. Activity is considered to be released to the secondary containment during the blowdown period with no credit taken for source dilution effects as a consequence of clean coolant injection.

15.6.2.3.3 Results

The total integrated mass of fluid released into the secondary containment via the break during the blowdown is 25,000 pounds. Of this total, 6000 pounds flash to steam. Release of this mass of coolant results in a secondary containment pressure which is well below the design pressure.

The consequences of an instrument line break accident do not result in any cladding perforations.

As a consequence of reactor scram and depressurization, it is expected that additional iodine and noble gas activity will be released from those fuel rods which may have experienced cladding defects during normal operation. The noble gases, being only slightly soluble in the reactor coolant, will, for the most part, be released to the reactor vessel vapor dome. However, the released iodine is assumed to remain in the coolant and is discharged from the vessel in proportion to the mass of the coolant released.

The activity airborne within the secondary containment is a function of the primary coolant activity, blowdown rate, condensation rate, fraction of liquid which flashes to steam, and leakage rate from the containment. It is assumed that normal ventilation occurs for the first 10 minutes, followed by building isolation and initiation of the SGTS for the remainder of the event. Correlating the effects of these parameters and considering a combined washout-plateout factor of 2, the activity airborne in the secondary containment as a function of time is presented in Table 15.6.2-1.

This event was conservatively analyzed. As a result of this conservative approach, no uncertainties were evaluated.

At the present time the NRC has not issued any guidelines for evaluating this event. Therefore, no comparison can be made between a realistic and an NRC guided analysis. However, Table 15.6.2-2 is included and itemizes those parametric values applicable to a realistic analysis.

15.6.2.4 Barrier Performance

An evaluation of the barrier performance was not made for this event since no radioactive material is released from the fuel.

15.6.2.5 Radiological Consequences

The fission product activity released to the environment is based on a ventilation rate from the secondary containment of one air change per day and a standby gas treatment system iodine removal efficiency of 95%. The iodine released as a function of time is presented in Table 15.6.2-3.

The radiological exposures have been evaluated for the meteorological conditions defined in Subsection 15.0.2 and the methods presented in Reference 2. The doses are presented in Table 15.6.2-4.

15.6.2.6 References

1. F. J. Moody, "Maximum Two-Phase Vessel Blowdown From Pipes," ASME Paper Number 65-WA/HT-1, March 15, 1969.

2. N. R. Horton, W. A. Williams, and J. W. Holtzclaw, "Analytical Methods For Evaluating the Radiological Aspects of the General Electric Boiling Water Reactor," APED 5756, March 1969.

TABLE 15.6.2-1

INSTRUMENT LINE FAILURE

ACTIVITY AIRBORNE IN THE SECONDARY CONTAINMENT (curies)

(Realistic Analysis)

ISOTOPE	10 MINUTES	1 HOUR	2 HOURS	8 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	1.55E-03	1.54E 00	3.58E 00	5.40E 00	2.62E 00	1.00E-01	5.60E-14
I-132	7.59E-04	6.93E-01	1.40E 00	5.22E-01	2.09E-03	3.24E-14	0.
I-133	5.52E-03	5.42E 00	1.24E 01	1.62E 01	4.88E 00	2.19E-02	0.
I-134	2.75E-04	2.22E-01	3.71E-01	1.96E-02	3.16E-08	0.	0.
I-135	1.54E-03	1.48E 00	3.29E 00	3.04E 00	2.90E-01	7.34E-06	0.
TOTAL	9.64E-03	9.35E 00	2.11E 01	2.52E 01	7.79E 00	1.22E-01	5.60E-14

TABLE 15.6.2-2

INSTRUMENT LINE BREAK ACCIDENT - PARAMETERS

TO BE TABULATED FOR POSTULATED ACCIDENT ANALYSES

	CONSERVATIVE (NRC) ASSUMPTIONS	REALISTIC (CONSERVATIVE) ENGINEERING ASSUMPTIONS
I. Data and assumptions used to estimate radioactive source from postulated accidents		
A. Power level corresponding to 105% NBR steam flow	NA	3458 MWt
B. Burnup	NA	NA
C. Fuel damaged	NA	None
D. Release of activity by nuclide	NA	Table 15.6.2-3
E. Iodine fractions		
(1) Organic	NA	0
(2) Elemental		1
(3) Particulate		0
F. Reactor coolant activity before the accident	NA	Subsection 15.6.5.5
II. Data and assumptions used to estimate activity released		
A. Primary containment leak rate (%/day)	NA	NA
B. Secondary containment leak rate (%/day)	NA	100
C. Valve movement times	NA	NA
D. Adsorption and filtration efficiencies		
(1) Organic iodine	NA	95
(2) Elemental iodine	NA	95
(3) Particulate iodine	NA	95
(4) Particulate fission products	NA	NA
E. Recirculation system parameters		
(1) Flow rate	NA	NA
(2) Mixing efficiency	NA	NA
(3) Filter efficiency	NA	NA
F. Containment spray parameters (flow rate, drop size, etc.)	NA	NA
G. Containment volumes	NA	NA
H. All other pertinent data and assumptions	NA	None
III. Dispersion Data		
A. Boundary and LPZ distance (meters)	NA	509/6400
B. χ/Q's for time intervals of		
(1) 0-2 hr - SB/LPZ	NA	1.7(-5)/3.1(-6)
(2) 2-8 hr - LPZ	NA	3.1(-6)
(3) 8-24 hr - LPZ	NA	6.7(-7)
(4) 1-4 days - LPZ	NA	9.9(-8)
(5) 4-30 days - LPZ	NA	6.6(-8)
IV. Dose Data		
A. Method of dose calculation	NA	Reference 2
B. Dose conversion assumptions	NA	Reference 2
C. Peak activity concentrations in secondary containment	NA	Table 15.6.2-1
D. Doses	NA	Table 15.6.2-4

TABLE 15.6.2-3

INSTRUMENT LINE FAILURE

ACTIVITY RELEASED TO THE ENVIRONMENT (curies)

(Realistic Analysis)

ISOTOPE	10 MINUTE	1 HOUR	2 HOURS	8 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	6.68E-04	1.80E-03	7.14E-03	7.51E-02	2.03E-01	3.19E-01	3.24E-01
I-132	3.29E-04	8.56E-04	3.08E-03	1.83E-02	2.15E-02	2.15E-02	2.15E-02
I-133	2.37E-03	6.38E-03	2.50E-02	2.46E-01	5.61E-01	6.96E-01	6.97E-01
I-134	1.20E-04	2.97E-04	9.34E-04	3.35E-03	3.40E-03	3.40E-03	3.40E-03
I-135	6.64E-04	1.77E-03	6.78E-03	5.71E-02	9.61E-02	1.00E-01	1.00E-01
TOTAL	4.16E-03	1.11E-02	4.30E-02	4.00E-01	8.85E-01	1.14E 00	1.15E 00

TABLE 15.6.2-4

INSTRUMENT LINE BREAK
RADIOLOGICAL EFFECTS

		10 CFR 100		CONSERVATIVE	
		(2 hours)	(30 days)	(2 hours)	(30 days)
A. Exclusion Boundary (509 meters)	Whole Body Dose (rem)	25	N/A	1.1E-07	--
	Thyroid Dose (rem)	300	N/A	1.3E-04	--
B. Point of Interest (915 meters)	Whole Body Dose (rem)	N/A	N/A	--	--
	Thyroid Dose (rem)	N/A	N/A	--	--
C. Low Population Zone (6400 meters)	Whole Body Dose (rem)	N/A	25	N/A	5.8E-07
	Thyroid Dose (rem)	N/A	300	N/A	2.9E-04

15.6.3 Steam Generator Tube Failure

Not applicable.

15.6.4 Steam System Pipe Break Outside the Secondary Containment

15.6.4.1 Identification of Causes and Frequency Classification

A main steamline break is assumed without the cause being identified. This arbitrary assumption has the associative frequency of a limiting fault.

15.6.4.2 Sequence of Events and Systems Operation

Accidents that result in the release of radioactive materials outside the secondary containment are the results of postulated breaches in the reactor coolant pressure boundary. A break spectrum analysis for the complete range of reactor conditions indicates that the design-basis accident for breaks outside the secondary containment is a complete severance of one of the main steamlines. The sequence of events and approximate time required to reach the event is as follows:

Event	Approximate Elapsed Time
Event begins - postulated instantaneous break of main steamline occurs.	0
High flow signal initiating MSIV closure.	<0.5 second
Reactor begins scram.	<1.0 second
MSIV fully closed.	≤5.5 seconds
Operator actions begin.	600 seconds

As a consequence of high flow in the main steamlines, closure of the main steamline isolation valves and reactor scram will be initiated automatically. No operator action is necessary during the break isolation.

After isolation occurs, the reactor pressure rises to a point where the relief valves open. The operator will monitor the shutdown reactor water level and pressure and the isolation; he will also observe that adequate shutdown cooling is provided.

15.6.4.3 Core and System Performance

15.6.4.3.1 Mathematical Model

Realistic Analysis

This accident evaluation is considered to be a conservative assessment of the consequences of a failure of one of the main steamlines external to the secondary containment for the most probable plant operating condition.

A postulated guillotine break of one of the four main steamlines outside the secondary containment results in mass loss from both ends of the break. The flow from the break is determined by considering not only the minimum flow areas, but also the system pipe and valve loss characteristics. The following assumptions and conditions are used in determining the mass loss from the primary system from the inception of the break to full closure of the MSIV's:

a. The reactor is operating at 105% rated steam flow conditions.

b. Instantaneous circumferential break of the main steamline occurs.

c. Nuclear system pressure is initially 1055 psia and the effects of RPV pressure decrease during transient are considered.

d. Isolation valves start to close at 0.5 second on high flow signal and are fully closed at 5.5 seconds.

e. Homogeneous critical flow model (Reference 1) is applicable. The effects of pipe friction and valve losses are included.

f. A-C power is available.

This analysis differs from the NRC guideline analysis (following) in that the effects of the most probable operating condition, equipment availability, pipe and valve losses, level rise, and quality transient are all included in this analysis.

Design-Basis (NRC) Analysis

The methods, assumptions, and conditions which are used to evaluate the consequences of this accident are in accordance with those guidelines presented in NRC Regulatory Guide 1.5.

Initially only steam will issue from the broken end of the steamline. The flow in each line is limited by critical flow at the limiter to a maximum of 200% of rated flow for each line. Rapid depressurization of the RPV causes the water level to rise, resulting in a steam-water mixture flowing from the break until the valves are closed. The total integrated mass leaving the RPV through the steamline break is 100,000 pounds, of which 86,000 pounds is liquid and 14,000 pounds is steam.

A postulated guillotine break of one of the four main steamlines outside the primary containment results in mass loss from both ends of the break. The flow from the upstream side is initially limited by the flow restrictor upstream of the inboard isolation valve. Flow from the downstream side is initially limited by the total area of the flow restrictors in the three unbroken lines. Subsequent closure of the MSIV's further limits the flow when the valve area becomes less than the limiter area and finally terminates the mass loss when full closure is reached. The following assumptions and conditions are used in determining the mass loss from the primary system from the inception of the break to full closure of the MSIV's:

a. The reactor is operating at the power level associated with maximum mass release (3458 MWt).

b. Nuclear system pressure is 1055 psia and remains constant during closure.

c. An instantaneous circumferential break of the main steamline occurs.

d. Isolation valves start to close at 0.5 second on high flow signal and are fully closed at 5.5 seconds.

e. The Moody critical flow model (Reference 1) is applicable.

f. Level rise time is conservatively assumed to be 1 second. Mixture quality is conservatively taken to be a constant 7% (steam weight percentage) during mixture flow.

g. Offsite a-c power is lost.

15.6.4.3.2 Input Parameters and Initial Conditions

Prior to this accident the reactor is at normal plant operating conditions. The following assumptions are used in the calculation of the quantity and types of radioactive material released from the reactor coolant pressure boundary.

a. The amount of steam discharged is that calculated in the analysis of the nuclear system transient.

b. The concentrations of biologically significant radionuclides contained in the primary coolant are as follows:

I-131	0.013	Ci/gm
I-132	0.12	Ci/gm
I-133	0.089	Ci/gm
I-134	0.24	Ci/gm
I-135	0.13	Ci/gm

Measurements made on current generation BWR's show the activity ratio between the main turbine condensate and reactor coolant is on the order of 0.5% to 2%. For the purpose of this evaluation the conservative assumption is made that the activity per pound of steam is equal to 2% of the activity per pound of reactor water.

c. The noble gas discharge rate, after 30 minutes holdup, is assumed to be 0.1 Ci/sec, an unusually high normal discharge rate. This assumption permits direct computation of the amount of noble gas activity leaving the reactor vessel at the time of the accident. The result is that 0.45 Ci of noble gas activity leaves the reactor vessel during each second that the isolation valve is open.

d. Because of the short half-life of nitrogen-16, the radiological effects from this isotope are of no major concern and are not considered in the analysis.

15.6.4.3.3 Results

Realistic Analysis

Using the most probable operating condition prior to the postulated break and realistic assumptions, the calculated mixture level in the RPV does not reach the steamline before isolation is complete. Therefore, only steam will issue from the break during the entire transient. The total integrated mass leaving the break is 36,000 pounds of steam.

The activity released from the hypothetical steamline break accident is a function of the coolant activity, valve closure time, and mass of coolant released. A portion of the released coolant exists as steam prior to the blowdown, and as such does not contain the same concentration per unit of mass as does the steam generated as a consequence of the blowdown. Therefore, it is necessary to subtract the initial steam mass from the total mass released and assign to it only 2% of the iodine activity contained by an equivalent mass of primary coolant. The isotopic activity released to the environment is shown in Table 15.6.4-1.

There are no fuel cladding perforations as a consequence of this accident.

Design-Basis (NRC) Analysis

The only activity released from the reactor vessel is that activity contained in the coolant as a result of normal operation. It is assumed that an equilibrium coolant concentration consistent with a 30-minute off-gas release rate of 0.3 Ci/sec exists prior to the accident. Although there will be some activation and corrosion products released, the isotopes of primary importance are the iodine isotopes. The iodine isotopes and noble gas activity released from the break and to the environment prior to isolation valve closure time are presented in Table 15.6.4-2.

There is no fuel damage as a consequence of this accident.

15.6.4.4 Barrier Performance

An evaluation of the barrier performance was not made for this event since the postulated break occurred outside the secondary containment. The assumed break is the only pathway by which radioactive material is released.

15.6.4.5 Radiological Consequences

The resulting radiological exposures are presented in Table 15.6.4-3. The meteorological conditions presented in Subsection 15.0.2 were used.

Those parameters which are of greatest importance in evaluating the radiological exposures are listed in Table 15.6.4-4 and are compared for the cases of realistic and NRC conservative analyses previously described.

15.6.4.6 References

1. F. J. Moody, "Maximum Two-Phase Vessel Blowdown From Pipes," ASME Paper Number 65-WA/HT-1, March 15, 1965.

2. N. R. Horton, W. A. Williams, and J. W. Holtzclaw, "Analytical Methods For Evaluating the Radiological Aspects of the General Electric Boiling Water Reactor," APED 5756, March 1969.

TABLE 15.6.4-1

STEAMLINE BREAK ACCIDENT

ACTIVITY RELEASED TO THE ENVIRONMENT (curies)

(Realistic Analysis)

ISTOPE	ACTIVITY
I-131	1.2E-01
I-132	1.1E 00
I-133	8.1E-01
I-134	2.2E 00
I-135	1.2E 00
TOTAL	5.4E 00
KR-83M	2.3E-02
KR-85M	4.1E-02
KR-85	1.6E-04
KR-87	1.2E-01
KR-88	1.3E-01
KR-89	5.4E-01
XE-131M	1.3E-04
XE-133M	1.7E-03
XE-133	5.4E-02
XE-135M	1.6E-01
XE-135	1.4E-01
XE-137	7.1E-01
XE-138	5.4E-01
TOTAL	2.5E 00

TABLE 15.6.4-2

STEAMLINE BREAK ACCIDENT

ACTIVITY RELEASED TO THE ENVIRONMENT (curies)

(Design (NRC) Basis)

ISOTOPE	CURIES
I-131	1.527E 00
I-132	1.410E 01
I-133	1.046E 01
I-134	2.819E 01
I-135	1.527E 01
TOTAL HALOGENS	6.954E 01
KR-83M	6.950E-02
KR-85M	1.218E-01
KR-85	4.752E-04
KR-87	3.794E-01
KR-88	3.891E-01
KR-89	1.619E 00
XE-131M	3.883E-04
XE-133M	5.806E-03
XE-133	1.626E-01
XE-135M	4.759E-01
XE-135	4.388E-01
XE-137	2.138E 00
XE-138	1.619E 00
TOTAL NOBLE GASES	7.419E 00

TABLE 15.6.4-3

STEAMLINE BREAK
RADIOLOGICAL EFFECTS

			10 CFR 100		NRC		REALISTIC	
			(2 hours)	(30 days)	(2 hours)	(30 days)	(2 hours)	(30 days)
A. Exclusion Boundary	(509 meters)	Whole Body Dose (rem)	25	N/A	2.32E-02	--	4.3E-05	--
		Thyroid Dose (rem)	300	N/A	2.27E-00	--	6.3E-03	--
B. Point of Interest	(915 meters)	Whole Body Dose (rem)	N/A	N/A	1.34E-02	--	--	--
		Thyroid Dose (rem)	N/A	N/A	1.31E-00	--	--	--
C. Low Population Zone	(6400 meters)	Whole Body Dose (rem)	N/A	25	N/A	2.35E-03	N/A	1.0E-05
		Thyroid Dose (rem)	N/A	300	N/A	2.30E-00	N/A	1.6E-03

TABLE 15.6.4-4

STEAMLINE BREAK ACCIDENT - PARAMETERS

TO BE TABULATED FOR POSTULATED ACCIDENT ANALYSES

	CONSERVATIVE (NRC) ASSUMPTIONS	REALISTIC (CONSERVATIVE) ENGINEERING ASSUMPTIONS
I. Data and assumptions used to estimate radioactive source from postulated accidents		
A. Power level corresponding to 105% NBR steam flow	3458 MWt	3458 MWt
B. Burnup	NA	NA
C. Fuel damaged	None	None
D. Release of activity by nuclide	Table 15.6.4-2	Table 15.6.4-1
E. Iodine fractions		
(1) Organic	0	0
(2) Elemental	1	1
(3) Particulate	0	0
F. Reactor coolant activity before the accident	Subsection 15.6.5.3.3	Subsection 15.6.5.3.3
II. Data and assumptions used to estimate activity released		
A. Containment leak rate (%/day)	NA	NA
B. Secondary containment leak rate (%/day)	NA	NA
C. Isolation valve closure time (sec)	5.5	5.5
D. Adsorption and filtration efficiencies		
(1) Organic iodine	NA	NA
(2) Elemental iodine	NA	NA
(3) Particulate iodine	NA	NA
(4) Particulate fission products	NA	NA
E. Recirculation system parameters	NA	NA
(1) Flow rate	NA	NA
(2) Mixing efficiency	NA	NA
(3) Filter efficiency	NA	NA
F. Containment spray parameters (flow rate, drop size, etc.)	NA	NA
G. Containment volumes	NA	NA
H. All other pertinent data and assumptions	None	None
III. Dispersion Data		
A. Boundary and LPZ distance (meters)	509/6400	509/6400
B. χ /Q's for		
(1) Total dose - SB/LPZ	6.7(-4)/6.7(-5)	2.3(-5)/6.0(-6)
IV. Dose Data		
A. Method of dose calculation	Regulatory Guide 1.5	Reference 2
B. Dose conversion assumptions	Regulatory Guide 1.5	Reference 2
C. Peak activity concentrations in containment	NA	NA
D. Doses	Table 15.6.4-3	Table 15.6.4-3

15.6.5 Loss-of-Coolant Accidents Resulting from Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

15.6.5.1 Identification of Causes and Frequency Classification

There are no realistic, identifiable events which would result in a pipe break inside the primary containment of the magnitude required to cause a loss-of-coolant accident. However, since such an accident provides an upper limit estimate to the resultant effects for this category of pipe breaks, it is evaluated without the cause being identified.

The loss-of-coolant accident resulting from a pipe break inside the primary containment is arbitrarily assigned the frequency of a limiting fault.

15.6.5.2 Sequence of Events and Systems Operation

Accidents that could result in the release of radioactive fission products directly into the primary containment are the results of postulated nuclear system pipe breaks inside the drywell. Possibilities for all pipe break sizes and locations are investigated in Section 6.3, including the severance of small pipelines, the main steamlines upstream and downstream of the flow restrictors, and the recirculation loop pipelines. The most severe nuclear system effects and the greatest release of radioactive material to the primary containment result from a complete circumferential break of one of the recirculation loop pipelines. This accident is established as the design-basis loss-of-coolant accident for the nuclear system. The sequence of events associated with this accident is as follows:

a. event begins - sudden circumferential severance of one recirculation line;

b. reactor scrams;

c. automatic actuation of emergency systems; and

d. operator actions begin.

Following the pipe break and scram, the MSIV will close on the low-low level signal at time 0 plus approximately 5.5 seconds. The low-low water level or high drywell pressure signal will respectively initiate isolations of containment and HPCS and LPCI separation. The operator will verify that all rods are inserted, that both HPCS and LPCI have commenced operation, and that diesel generators have started.

At time 0 plus approximately 600 seconds, the operator manually initiates containment spray if needed to prevent containment overpressure.

When needed, the operator initiates operation of the RHR system in the suppression pool cooling mode and places the service water system in service.

15.6.5.3 Core and System Performance

15.6.5.3.1 Mathematical Model

The analytical methods and associated assumptions which are used in evaluating the consequences of this accident are represented in two ways. One is the conservative assessment of the consequences, based on NRC methods and assumptions (Regulatory Guide 1.3). The second realistic assessment uses models based on experience and testing.

These methods and models have been successively refined over the past several years. The details of these calculations, their justification, and bases for the models are developed in Reference 1 and Section 6.3.

The short-term containment response models used for analysis of this event are described in detail in Reference 2. The report includes all the assumptions used in the model as well as descriptions of experimental verification and a discussion of the degree of conservatism inherent in the calculated results.

The long-term model description and analytical development for this event is provided in detail in Section 6.2. Section 6.2 discusses the recirculation line break for the containment functional design basis.

15.6.5.3.2 Input Parameters and Initial Conditions

This accident is analyzed using the following assumptions:

a. The reactor is operating at that condition which maximizes the severity of the aspect of the accident being considered. Aspects considered are containment response, fission product release, and emergency core cooling system requirements.

b. A complete loss of normal power occurs simultaneously with the pipe break. This additional condition results in the longest delay time for the emergency core cooling systems to become operational. The situation in which a-c power availability is retained has also been investigated. The recirculation flow control valve characteristics are designed to assure that valve throttling does not present a more severe condition than pump coastdown.

c. The recirculation line is considered to be severed instantaneously. This results in the most rapid coolant loss and depressurization, with coolant discharged from both end- of the break.

15.6.5.3.3 Results

As identified in Section 6.3, the temperature and pressure transients resulting as a consequence of this accident are insufficient to breach fuel cladding. Therefore, no cladding perforations result from this accident.

Since these accidents do not result in any fuel damage, the only activity released to the drywell is that activity contained in the reactor coolant plus any additional activity which may be released as a consequence of reactor scram and vessel depressurization.

15.6.5.4 Barrier Performance

The design limits of both primary and secondary containment are not exceeded in either the conservative or the realistic evaluations.

15.6.5.5 Radiological Consequences

Realistic Basis

While there are various activation and corrosion products contained in the reactor coolant, the products of primary importance are the iodine isotopes I-131 to I-135, particularly I-131. The coolant concentration for these isotopes based on a release rate of 700 Ci/sec is:

I-131	0.013	Ci/gm
I-132	0.12	Ci/gm
I-133	0.089	Ci/gm
I-134	0.24	Ci/gm
I-135	0.13	Ci/gm

Considering that approximately 40% of the released liquid flashes to steam, it is conservatively assumed that 40% of the released iodine activity is airborne initially. However, as a result of plateout and condensation effects, only 50% of the activity initially airborne remains available for release to the environment.

As a consequence of reactor scram and depressurization, additional iodine activity is released from those rods which experienced cladding perforation during normal operation. Typical plant shutdowns have resulted in the additional release of I-131 in the range of 0.14 Ci to 1085 Ci, the average being 85 Ci (Reference 3).

Since this additional activity is released over a long period of time (in comparison to the time required to depressurize the reactor as a consequence of a LOCA), it is necessary to correlate the release rate of activity with the injection of the emergency core coolant. During the first 15 minutes of emergency coolant injection, approximately 10% of the coolant flashes to steam. However, after 15 minutes, all of the liquid leaving the vessel is subcooled. For the purpose of this analysis, it is assumed that 50% of the peak I-131 activity (i.e., 50% of 1085 Ci) is released within the first 15 minutes. Of this activity, 5% becomes airborne as a consequence of flashing liquid and iodine plateout. Also, proportionate quantities of I-132 to I-135 are assumed to be released. The remaining activity is assumed to be scrubbed by the ECCS coolant and an equilibrium condition between the liquid and the drywell air volume is formed.

In addition to the iodine activity released from the damaged rod as a consequence of scram and depressurization, additional noble gas activity is also assumed to be released.

Based on the conditions specified previously, the iodine and noble gas activity initially airborne in the primary containment is presented in Table 15.6.5-1. time dependence of the airborne activity is a function of the leakage rate and the isotopic half-lives.

Assuming a primary containment leak rate of 0.5%/day, uniform mixing in the reactor building and a release rate to the environment of one air change per day results in the reactor building activity presented in Table 15.6.5-2.

The fission product activity released to the environment is based on a ventilation rate of one air change per day and a standby gas treatment system filter efficiency of 95% for all forms of iodine. The noble gas and iodine released to the environment are presented in Table 15.6.5-3.

The radiological exposures resulting from the activity released to the environment have been determined for meteorological conditions presented in Reference 4. The radiological exposures for this accident are presented in Table 15.6.5-4.

Realistic evaluations of the radiological consequences for control room dose are not considered because this dose is insignificant.

<u>Design (NRC) Basis</u>

In accordance with Regulatory Guide 1.3, it is assumed that 100% of the noble gas activity and 50% of the iodine activity is released from the core. Of this release, 100% of the noble gases and 50% of the iodine becomes airborne. The remaining 50% of the iodine is removed by plateout and condensation, making this fraction unavailable for release to the environment.

The isotopic activity airborne in the primary containment is presented as a function of time in Table 15.6.5-5. The primary containment leak rate is assumed to be 0.635% per day.

No credit is taken for holdup in the reactor building, therefore no reduction in activity is assumed from residence time in the building.

Direct leakage from the containment to the SGTS is assumed. The SGTS filter efficiency is 90%. The noble gas and iodine released as a function of time are presented in Table 15.6.5-6.

Calculations based on the releases presented in Table 15.6.5-6 and the analytical models in Regulatory Guide 1.3 result in the radiological exposures presented in Table 15.6.5-4.

The dose evaluation methods of General Design Criterion 19 were assumed. The conservative control room doses are given in Table 15.6.5-7. The skin (beta), whole body (gamma), and thyroid doses were calculated, and control room air intake filters were assumed to have an efficiency of 95% for iodines.

Comparison of Realistic and Design (NRC) Parameters

Those parameters which are of greatest importance in evaluating the radiological exposures are listed in Table 15.6.5-8 and are compared for the realistic and conservative (NRC) analyses previously described.

15.6.5.6 References

1. B. C. Slifer and J. E. Hench, "Loss-of-Coolant Accident and Emergency Core Cooling Models for General Electric Boiling Water Reactors," NEDO-10329, April 1971.

2. A. J. James and M. A. Libkind, "The General Electric Pressure Suppression Containment Analytical Model," NEDO-10320, April 1971, May 1971, and January 1973.

3. F. J. Brutschy et al., "Behavior of Iodine in Reactor Water During Plant Shutdown and Startup," NEDO-10585, August 1972.

4. N. R. Horton, W. A. Williams, and J. W. Holtzclaw, "Analytical Methods for Evaluating the Radiological Aspects of the General Electric Boiling Water Reactor," APED 5756, March 1969.

TABLE 15.6.5-1

LOSS-OF-COOLANT ACCIDENT

ACTIVITY AIRBORNE IN THE CONTAINMENT (curies)

(Realistic Analysis)

ISOTOPE	1 MINUTE	1 HOUR	2 HOURS	8 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	4.44E 01	4.42E 01	4.41E 01	4.31E 01	4.06E 01	3.11E 01	3.06E 00
I-132	2.85E 01	2.11E 01	1.56E 01	2.52E 00	1.96E-02	6.07E-12	0.
I-133	1.55E 02	1.50E 02	1.45E 02	1.18E 02	6.93E 01	6.20E 00	5.41E-09
I-134	2.16E 01	9.92E 00	4.49E 00	3.88E-02	1.21E-07	0.	0.
I-135	5.00E 01	4.51E 01	4.06E 01	2.16E 01	4.01E 00	2.02E-03	0.
TOTAL	2.99E 02	2.70E 02	2.49E 02	1.86E 02	1.14E 02	3.73E 01	3.06E 00
KR-83M	3.48E 02	2.41E 02	1.65E 02	1.75E 01	4.36E-02	8.09E-14	0.
KR-85M	1.93E 02	1.66E 02	1.42E 02	5.61E 01	4.70E 00	6.57E-05	0.
KR-85	3.20E 02	3.20E 02	3.20E 02	3.19E 02	3.18E 02	3.14E 02	2.75E 02
KR-87	1.70E 02	9.95E 01	5.76E 01	2.16E 00	3.39E-04	0.	0.
KR-88	3.40E 02	2.66E 02	2.08E 02	4.69E 01	8.89E-01	1.53E-08	0.
KR-89	4.42E 01	1.04E-04	1.98E-10	0.	0.	0.	0.
XE-131M	2.40E 01	2.39E 01	2.39E 01	2.35E 01	2.25E 01	1.87E 01	3.66E 00
XE-133M	1.04E 02	1.03E 02	1.01E 02	9.36E 01	7.58E 01	2.93E 01	8.01E-03
XE-133	5.00E 03	4.97E 03	4.94E 03	4.78E 03	4.36E 03	2.90E 03	8.42E 01
XE-135M	1.53E 01	1.06E 00	6.97E-02	5.76E-09	0.	0.	0.
XE-135	1.05E 03	9.73E 02	9.02E 02	5.73E 02	1.70E 02	7.20E-01	0.
XE-137	5.84E 01	1.38E-03	2.71E-08	0.	0.	0.	0.
XE-138	1.86E 02	1.04E 01	5.55E-01	1.28E-08	0.	0.	0.
TOTAL	7.85E 03	7.18E 03	6.86E 03	5.91E 03	4.96E 03	3.26E 03	3.63E 02

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TABLE 15.6.5-2

LOSS-OF-COOLANT ACCIDENT

ACTIVITY AIRBORNE IN THE REACTOR BUILDING (curies)

(Realistic Analysis)

ISOTOPE	1 MINUTE	1 HOUR	2 HOURS	8 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	1.54E-04	9.03E-03	1.76E-02	6.11E-02	1.29E-01	1.53E-01	1.53E-02
I-132	[illegible].89E-0[illegible]	4.31E-03	6.24E-03	3.58E-03	6.20E-05	2.99E-14	0.
I-133	5.36E-0[illegible]	3.05E-02	5.78E-02	1.68E-01	2.19E-01	3.05E-02	2.71E-11
I-134	7.51E-05	2.03E-03	1.80E-03	5.50E-05	3.84E-10	0.	0.
I-135	1.74E-04	9.20E-03	1.62E-02	3.06E-02	1.27E-02	9.97E-06	0.
TOTAL	1.04E-03	5.51E-02	9.97E-02	2.63E-01	3.60E-01	1.83E-01	1.53E-02
KR-83M	1.21E-03	4.91E-02	6.62E-02	2.48E-02	1.38E-04	3.99E-16	0.
KR-85M	6.72E-04	3.39E-02	5.69E-02	7.96E-02	1.49E-02	3.24E-07	0.
KR-85	1.11E-03	6.53E-02	1.28E-01	4.53E-01	1.01E 00	1.55E 00	1.38E 00
KR-87	5.92E-04	2.03E-02	2.30E-02	3.06E-03	1.07E-06	0.	0.
KR-89	1.18E-03	5.43E-02	8.31E-02	6.66E-02	2.82E-03	7.57E-11	0.
KR-89	1.53E-04	2.13E-08	7.90E-14	0.	0.	0.	0.
XE-131M	8.33E-05	4.88E-03	9.55E-03	3.33E-02	7.14E-02	9.21E-02	1.84E-02
XE-133M	3.61E-04	2.09E-02	4.05E-02	1.33E-01	2.40E-01	1.45E-01	4.03E-05
XE-133	1.74E-02	1.01E 00	1.98E 00	6.78E 00	1.38E 01	1.43E 01	4.23E-01
XE-135M	5.31E-05	2.15E-04	2.79E-05	8.16E-12	0.	0.	0.
XE-135	3.64E-03	1.99E-01	3.61E-01	8.12E-01	5.39E-01	3.55E-03	0.
XE-137	2.03E-04	2.18E-07	1.08E-11	0.	0.	0.	0.
XE-138	6.45E-04	2.12E-03	2.22E-04	1.82E-11	0.	0.	0.
TOTAL	[illegible].76E-02	1.46E 00	2.74E 00	8.38E 00	1.57E 01	1.61E 01	1.82E 00

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TABLE 15.6.5-3

LOSS-OF-COOLANT ACCIDENT

ACTIVITY RELEASED TO THE ENVIRONMENT (curies)

(Realistic Analysis)

ISOTOPE	1 MINUTE	1 HOUR	2 HOURS	8 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	3.10E-09	9.48E-06	3.73E-05	5.43E-04	3.86E-03	2.74E-02	1.06E-01
I-132	1.72E-09	5.02E-06	1.63E-05	8.65E-05	1.18E-04	1.19E-04	1.19E-04
I-133	9.45E-09	3.24E-05	1.25E-04	1.62E-03	8.67E-03	2.48E-02	2.67E-02
I-134	1.31E-09	2.82E-06	6.96E-06	1.42E-05	1.44E-05	1.44E-05	1.44E-05
I-135	3.02E-09	1.00E-05	3.68E-05	3.67E-04	1.11E-03	1.41E-03	1.41E-03
TOTAL	1.86E-08	5.97E-05	2.22E-04	2.63E-03	1.38E-02	5.37E-02	1.34E-01
KR-83M	4.20E-07	1.17E-03	3.65E-03	1.60E-02	1.95E-02	1.95E-02	1.95E-02
KR-85M	2.34E-07	7.50E-04	2.67E-03	2.24E-02	5.08E-02	5.53E-02	5.53E-02
KR-85	1.45E-06	1.37E-03	5.40E-03	7.97E-02	5.88E-01	4.80E 00	4.31E 01
KR-87	2.06E-07	5.16E-04	1.45E-03	4.36E-03	4.63E-03	4.63E-03	4.63E-03
KR-88	4.09E-07	1.24E-03	4.17E-03	2.60E-02	4.08E-02	4.13E-02	4.13E-02
KR-89	5.73E-08	2.74E-06	2.74E-06	2.74E-06	2.74E-06	2.74E-06	2.74E-06
XE-131M	3.74E-08	1.03E-04	4.04E-04	5.91E-03	4.25E-02	3.15E-01	1.52E 00
XE-133M	1.25E-07	4.41E-04	1.73E-03	2.42E-02	1.57E-01	7.91E-01	1.26E 00
XE-133	7.27E-06	2.13E-02	8.38E-02	1.21E 00	8.44E 00	5.56E 01	1.59E 02
XE-135M	1.87E-08	1.40E-05	1.80E-05	1.85E-05	1.85E-05	1.85E-05	1.85E-05
XE-135	1.28E-06	4.27E-03	1.60E-02	1.78E-01	6.68E-01	1.02E 00	1.03E 00
XE-137	7.49E-08	5.18E-06	5.16E-06	5.16E-06	5.16E-06	5.16E-06	5.16E-06
XE-138	2.28E-07	1.54E-04	1.91E-04	1.94E-04	1.94E-04	1.94E-04	1.94E-04
TOTAL	1.18E-05	3.14E-02	1.20E-01	1.57E 00	1.00E 01	6.26E 01	2.06E 02

TABLE 15.6.5-4

LOSS-OF-COOLANT ACCIDENT
RADIOLOGICAL EI.ECTS

			10 CFR 100		NRC		REALISTIC	
			(2 hours)	(30 days)	(2 hours)	(30 days)	(2 hours)	(30 days)
A. Exclusion Boundary	(509 meters)	Whole Body Dose (rem)	25	N/A	3.41E 00	5.25E 00	5.82E-08	--
		Thyroid Dose (rem)	300	N/A	5.96E 01	2.72E 02	6.60E-07	--
B. Point of Interest	(915 meters)	Whole Body Dose (rem)	N/A	N/A	2.05E 00	3.24E 00	--	--
		Thyroid Dose (rem)	N/A	N/A	3.68E 01	1.62E 02	--	--
C. Low Population Zone	(6400 meters)	Whole Body Dose (rem)	N/A	25	N/A	7.48E-01	N/A	1.28E-06
		Thyroid Dose (rem)	N/A	300	N/A	3.79E 01	N/A	5.39E-06

TABLE 15.6.5-5

LOSS-OF-COOLANT ACCIDENT

CONTAINMENT ACTIVITY (Curies)

(Design (NRC) Basis)

ISOTOPE	1 MINUTE	30 MINUTES	1 HOUR	2 HOURS	4 HOURS	8 HOURS	12 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	2.2E 07	2.2E 07	2.2E 07	2.2E 07	2.1E 07	2.1E 07	2.1E 07	2.0E 07	1.5E 07	1.4E 06
I-132	3.3E 07	2.8E 07	2.4E 07	1.8E 07	9.8E 06	2.9E 06	8.6E 05	2.2E 04	6.9E-06	0.
I-133	4.9E 07	4.8E 07	4.7E 07	4.5E 07	4.2E 07	3.7E 07	3.2E 07	2.2E 07	1.9E 06	1.5E-03
I-134	5.6E 07	3.8E 07	2.6E 07	1.2E 07	2.4E 06	1.0E 05	4.2E 03	3.1E-01	0.	0.
I-135	4.4E 07	4.2E 07	4.0E 07	3.6E 07	2.9E 07	1.9E [illegible]	1.2E 07	3.5E 06	1.8E 03	0.
TOTAL I	2.0E 08	1.8E 08	1.6E 08	1.3E 08	1.0E 08	8.0E 07	6.6E 07	4.5E 07	1.7E 07	1.4E 06
KR-83M	1.4E 07	1.2E 07	9.9E 06	6.8E 06	3.2E 06	7.2E 05	1.6E 05	1.8E 03	3.3E-09	0.
KR-85M	4.5E 07	4.2E 07	3.8E 07	3.3E 07	2.4E 07	1.3E 07	7.0E 06	1.1E 06	1.5E 01	0.
KR-85	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.4E 06	1.2E 06
KR-87	8.0E 07	6.1E 07	4.7E 07	2.7E 07	9.0E 06	1.0E 06	1.1E 05	1.6E 02	0.	0.
KR-88	1.1E 08	9.8E 07	8.6E 07	6.7E 07	4.1E 07	1.5E 07	5.6E 06	2.9E 05	5.0E-03	0.
KR-89	1.1E 08	1.9E 05	2.6E 02	4.9E-04	0.	0.	0.	0.	0.	0.
XE-131M	9.0E 05	9.0E 05	8.9E 05	8.9E 05	8.9E 05	8.8E 05	8.7E 05	8.4E 05	6.9E 05	1.3E 05
XE-133M	4.8E 06	4.8E 06	4.7E 06	4.7E 06	4.5E 06	4.3E 06	4.1E 06	3.5E 06	1.3E 06	3.5E 02
XE-133	1.9E 08	1.9E 08	1.9E 08	1.9E 08	1.9E 08	1.9E 08	1.8E 08	1.7E 08	1.1E 08	3.1E 06
XE-135M	5.1E 07	1.4E 07	3.6E 06	2.3E 05	1.0E 03	1.9E-02	3.7E-07	0.	0.	0.
XE-135	1.9E 08	1.8E 08	1.7E 08	1.6E 08	1.4E 08	1.0E 08	7.5E 07	3.0E 07	1.3E 05	0.
XE-137	1.5E 08	7.8E 05	3.5E 03	6.8E-02	2.6E-11	0.	0.	0.	0.	0.
XE-138	1.6E 08	3.8E 07	8.8E 06	4.7E 05	1.3E 03	1.1E-02	8.8E-08	0.	0.	0.
TOTAL NG	1.1E 09	6.4E 08	5.7E 08	4.9E 08	4.1E 08	3.2E 08	2.8E 08	2.1E 08	1.2E 08	4.4E 06

TABLE 15.6.5-6

LOSS-OF-COOLANT ACCIDENT

ACTIVITY RELEASED TO ENVIRONS (curies)

(Design (NRC) Basis)

ISOTOPE	1 MINUTE	30 MINUTES	1 HOUR	2 HOURS	4 HOURS	8 HOURS	12 HOURS	1 DAY	4 DAYS	30 DAYS
I-131	9.6E 00	2.9E 02	5.7E 02	1.1E 03	2.3E 03	4.5E 03	6.7E 03	1.3E 04	4.6E 04	1.4E 05
I-132	1.4E 01	4.0E 02	7.5E 02	1.3E 03	2.0E 03	2.6E 03	2.8E 03	2.9E 03	2.9E 03	2.9E 03
I-133	2.1E 01	6.4E 02	1.3E 03	2.5E 03	4.8E 03	9.0E 03	1.3E 04	2.1E 04	3.7E 04	3.8E 04
I-134	2.5E 01	6.2E 02	1.0E 03	1.5E 03	1.8E 03	1.9E 03	1.[illegible]E 03	1.9E 03	1.9E 03	1.9E 03
I-135	1.9E 01	5.7E 02	1.1E 03	2.1E 03	3.8E 03	6.3E 03	7.9E 03	1.0E 04	1.1E 04	1.1E 04
TOTAL I	9.0E 01	2.5E 03	4.7E 03	8.5E 03	1.5E 04	2.4E 04	3.2E 04	4.9E 04	9.9E 04	1.9E 05
KR-83M	6.3E 01	1.7E 03	3.2E 03	5.3E 03	7.9E 03	9.6E 03	1.0E 04	1.0E 04	1.0E 04	1.0E 04
KR-85M	2.0E 02	5.7E 03	1.1E 04	2.0E 04	3.5E 04	5.4E 04	6.5E 04	7.5E 04	7.7E 04	7.7E 04
KR-85	6.3E 00	1.9E 02	3.8E 02	7.5E 02	1.5E 03	3.0E 03	4.5E 03	9.0E 03	3.6E 04	2.5E 05
KR-87	3.5E 02	9.3E 03	1.6E 04	2.6E 04	3.5E 04	3.9E 04	3.9E 04	3.9E 04	3.9E 04	3.9E 04
KR-88	4.9E 02	1.4E 04	2.6E 04	4.6E 04	7.4E 04	1.0E 05	1.1E 05	1.2E 05	1.2E 05	1.2E 05
KR-89	5.4E 02	2.8E 03	2.8E 03	2.8E 03	2.8E 03	2.8E 03	2.8E 03	2.8E 03	2.8E 03	2.8E 03
XE-131M	4.0E 00	1.2E 02	2.4E 02	4.7E 02	9.4E 02	1.9E 03	2.8E 03	5.5E 03	2.0E 04	7.6E 04
XE-133M	2.1E 01	6.3E 02	1.3E 03	2.5E 03	4.9E 03	9.6E 03	1.4E 04	2.6E 04	6.9E 04	9.6E 04
XE-133	8.6E 02	2.6E 04	5.1E 01	1.0E 05	2.0E 05	4.0E 05	6.0E 05	1.2E 06	3.8E 06	6.8E 06
XE-135M	2.3E 02	3.9E 03	4.9E 03	5.2E 03	5.2E 03	5.2E 03	5.2E 03	5.2E 03	5.2E 03	5.2E 03
XE-135	8.2E 02	2.4E 04	4.7E 04	9.1E 04	1.7E 05	2.9E 05	3.9E 05	5.4E 05	6.5E 05	6.5E 05
XE-137	7.1E 02	4.3E 03	4.3E 03	4.3E 03	4.3E 03	4.3E 03	4.3E 03	4.3E 03	4.3E 03	4.3E 03
XE-138	7.1E 02	1.1E 04	1.4E 04	1.5E 04	1.5E 04	1.5E 04	1.5E 04	1.5E 04	1.5E 04	1.5E 04
TOTAL NG	5.0E 03	1.0E 05	1.5E 05	3.2E 05	5.6E 05	9.4E 05	1.3E 06	2.0E 06	4.8E 06	1.0E 07

TABLE 15.6.5-7

LOSS-OF-COOLANT ACCIDENT (LOCA)

CONTROL ROOM DOSES
(Design (NRC) Basis)

	DOSE (rem) USING CONSERVATIVE ASSUMPTIONS
Skin (Beta)	3.4
Whole Body (Gamma)	0.31
Thyroid	10.3

TABLE 15.6.5-8

LOSS-OF-COOLANT ACCIDENT - PARAMETERS

TO BE TABULATED FOR POSTULATED ACCIDENT ANALYSES

	CONSERVATIVE (NRC) ASSUMPTIONS	REALISTIC (CONSERVATIVE) ENGINEERING ASSUMPTIONS
I. Data and assumptions used to estimate radioactive source from postulated accidents		
A. Power level corresponding to 105% NBR steam flow	3458 Mwt	3458 MWt
B. Burnup	NA	NA
C. Fuel damaged	100%	100%
D. Release of activity by nuclide	Table 15.6.5-6	Table 15.6.5-3
E. Iodine fractions		
(1) Organic	4%	1%
(2) Elemental	91%	99%
(3) Particulate	5%	0
F. Reactor coolant activity before the accident	Subsection 15.6.5.5	Subsection 15.6.5.5
II. Data and assumptions used to estimate activity released		
A. Primary containment leak rate (%/day)	0.635	0.5
B. Secondary containment leak rate (%/day)	NA	100
C. Valve movement times	NA	NA
D. Adsorption and filtration efficiencies (%)		
(1) Organic iodine	90	95
(2) Elemental iodine	90	95
(3) Particulate iodine	90	95
(4) Particulate fission products	NA	NA
E. Recirculation system parameters		
(1) Flow rate (CFM)	NA	NA
(2) Mixing efficiency	NA	NA
(3) Filter efficiency	NA	NA
F. Containment spray parameters (flow rate, drop size, etc.)	NA	NA
G. Containment volumes	NA	NA
H. All other pertinent data and assumptions	None	None
III. Dispersion Data		
A. Boundary and LPZ distance (meters)	509/6400	509/6400
B. χ/Q's for time intervals of		
(1) 0-0.5 hr - SB/LPZ	1.8(-4)/1.8(-5)	1.7(-5)/3.1(-6)
(2) 0.5-2 hr - SB/LPZ	1.5(-5)/4.4(-6)	1.7(-5)/3.1(-6)
(3) 2-8 hr - LPZ	4.4(-6)	3.1(-6)
(4) 8-24 hr - LPZ	1.7(-6)	6.7(-7)
(5) 1-4 days - LPZ	5.0(-7)	9.9(-8)
(6) 4-30 days - LPZ	1.7(-7)	6.6(-8)

TABLE 15.6.5-8 (Cont'd)

	CONSERVATIVE (NRC) ASSUMPTIONS	REALISTIC (CONSERVATIVE) ENGINEERING ASSUMPTIONS
IV. Dose Data		
A. Method of dose calculation	Regulatory Guide 1.3	Reference 4
B. Dose conversion assumptions	Regulatory Guide 1.3	Reference 4
C. Peak activity concentrations in the containment	Table 15.6.5-5	Table 15.6.5-1
D. Peak activity concentrations in the reactor building	NA	Table 15.6.5-2
E. Doses	Tables 16.5.5-4 and 15.6.5-7	Table 15.6.5-4

15.6.6 Feedwater Line Break

15.6.6.1 Identification of Causes and Frequency Classification

A feedwater line break is assumed without the cause being identified. Frequency applicable to a limiting fault is arbitrarily assigned to this event.

15.6.6.2 Sequence of Events and Systems Operation

Accidents that result in the release of radioactive materials outside the secondary containment are the result of postulated breaches in the reactor coolant pressure boundary. A break spectrum analysis for the complete range of reactor conditions indicates that the design-basis accident for breaks outside the containment is a complete severance of one of the main steamlines.

Sequence of Events	Approximate Elapsed Time
Feedwater pipe breaks circumferentially between the last high-pressure heater and the outboard feedwater check valve	0.0
Feedwater flow into vessel reaches zero and feedwater check valves in the broken line isolate the reactor from the break.	4 seconds
Low reactor vessel water level scrams the reactor.	8 seconds
The feedwater pipe break reduces the reactor feed pump suction pressure or the condensate pump discharge pressure sufficiently to trip the condensate and/or condensate booster pumps.	
Low-water level in reactor closes the main steamline isolation valves.	30 seconds
Steam for the turbine-driven feed pumps exhausts either from the main turbine cross-around piping or the steamlines between the main steamline isolation valves and the main turbine stop valves. Reactor feed pumps continue to coastdown.	

Inventory of water in the main condenser hotwell is completely pumped out of the break by the condensate and/or condensate booster pumps.	7 minutes
The feedwater lines between the last feedwater heater and the break completely drain out the break.	15 minutes

The operator maintains adequate reactor coolant inventory with RCIC and/or HPCS. The feedwater line check valves isolate the re-ctor from the break; no operator actions are necessary to ef ect reactor isolation.

Sequence of Operator Actions	Approximate Elapsed Time
Event begins - failure occurs.	0
The operator assures that the reactor is shut down and that RCIC and/or HPCS are operating normally.	
The operator initiates the RHR system in the steam condensing mode as needed.	
When the reactor pressure has descreased below 150 psi, the operator can initiate RHR in the shutdown cooling mode to continue reactor cooldown.	

15.6.6.3 Core and System Performance

15.6.6.3.1 Mathematical Model

The accident evaluation considered in this subsection is considered to be a conservative assessment of the consequences of a failure of the feedwater piping external to the containment for the most probable plant operating condition.

15.6.6.3.2 Input Parameters and Initial Conditions

Prior to this event the reactor is operating at normal plant operating full power condition.

A postulated guillotine break of the feedwater system piping outside the containment results in a mass loss of 788,000 pounds from the break. The flow from the break is realistically determined with the following assumptions and conditions.

a. The reactor is operating with 100% feedwater flow.

b. A sudden circumferential break occurs in one of the feedwater lines between the last feedwater heater and the turbine building-reactor building interface.

c. Nuclear system pressure is initially at 1055 psi.

d. The feedwater check valves operate immediately to isolate the break from the reactor pressure vessel.

e. The condensate and/or the condensate booster pumps are assumed to pump all of the water from the hotwell out of the feedwater line break.

f. The mass of water pumped out of the break from the fifth stage feedwater heater, the mass of water which results from the complete drainage of the feedwater piping downsteam of the last feedwater heater, and the trapped condensed steam in the turbine piping are considered negligible compared to the inventory in the hotwell.

The following assumptions are used in the calculations of the quantity and types of radioactive material released from the reactor coolant pressure boundary.

a. The concentrations of biologically significant radionuclides contained in the primary coolant are as follows (Ci/gm):

I-131	0.013
I-132	0.12
I-133	0.089
I-134	0.24
I-135	0.13

Measurements made on current generation BWR's show the activity ratio between the main turbine condensate and reactor coolant is on the order of 0.5% to 2%. For the purposes of this evaluation the conservative assumption is made that the activity per pound of steam is equal to 2% of the activity per pound of reactor water.

b. Noble gas activity in the feedwater is negligible.

c. Because of the short half-life of nitrogen 16, the radiological effects from this isotope are negligible and are not considered in the analysis.

d. It is assumed that as the flow in the condensate feedwater system increases after the pipe break, the high differential pressure across the condensate demineralizers automatically opens the demineralizer bypass flow.

e. Normal operating iodine reduction by the condensate demineralizers is 99.9%.

15.6.6.3.3 Results

For the most probable operating condition prior to the postulated break and using realistic assumptions, the total integrated mass of coolant leaving the break is 788,000 pounds, 21% of which (165,000 pounds) flashes to steam.

There are no cladding perforations as a consequence of this event.

The isotopic activity discharged from the break is presented in Table 15.6.6-2.

An NRC guideline evaluation of this accident was not made. However, those parameters of significance in evaluating the consequences of this event are presented in Table 15.6.6-1.

15.6.6.4 Barrier Performance

No barriers are affected other than the break which is analyzed here.

15.6.6.5 Radiological Consequences

It is conservatively assumed that 50% of the airborne activity released from the break is removed by condensation and plateout prior to release to the environment. The iodine release to the environment is presented in Table 15.6.6-2.

The radiological effects are based on a puff release to the atmosphere using the meteorology presented in Table 15.6.2-4 and the methods presented in Reference 1. The whole body dose results from the gamma radiation emitted by the iodines of interest. The doses are presented in Table 15.6.6-3.

15.6.6.6 References

1. N. R. Horton, W. A. Williams, and J. W. Holtzclaw, "Analytical Methods For Evaluating the Radiological Aspects of the General Electric Boiling Water Reactor," APED 5756, March 1969.

TABLE 15.6.6-1

FEEDWATER LINE BREAK ACCIDENT - PARAMETERS

TO BE TABULATED FOR POSTULATED ACCIDENT ANALYSES

	NRC ASSUMPTIONS	CONSERVATIVE ASSUMPTIONS
I. Data and assumptions used to estimate radioactive source from postulated accidents		
A. Power level corresponding to 105% NBR steam flow	NA	3458 MWt
B. Burnup	NA	NA
C. Fuel damaged	NA	None
D. Release of activity by nuclide	NA	Subsection 15.6.6.3.3
E. Iodine fractions		
(1) Organic	NA	0
(2) Elemental	NA	1
(3) Particulate	NA	0
F. Reactor coolant activity before the accident	NA	Subsection 15.6.6.3.3
II. Data and assumptions used to estimate activity released		
A. Containment leak rate (%/day)	NA	NA
B. Secondary containment leak rate (%/day)	NA	NA
C. Isolation valve closure time (sec)	NA	30
D. Adsorption and filtration efficiencies		
(1) Organic iodine	NA	NA
(2) Elemental iodine	NA	NA
(3) Particulate iodine	NA	NA
(4) Particulate fission products	NA	NA
E. Recirculation system parameters		
(1) Flow rate	NA	NA
(2) Mixing efficiency	NA	NA
(3) Filter efficiency	NA	NA
F. Containment spray parameters (flow rate, drop size, etc.)	NA	NA
G. Containment volumes	NA	NA
H. All other pertinent data and assumptions	NA	None
III. Dispersion Data		
A. Boundary and LPZ distance (meters)	NA	509/6400
B. χ/Q's for time intervals of		
(1) 0-2 hr - SB/LPZ	NA	8.3(-4)/1.1(-4)
IV. Dose Data		
A. Method of dose calculation	NA	Reference 1
B. Dose conversion assumptions	NA	Reference 1
C. Peak activity concentrations in containment	NA	NA
D. Doses	NA	Table 15.6.6-3

TABLE 15.6.6-2

FEEDWATER LINE BREAK

ACTIVITY RELEASED FROM THE BREAK (curies)

(Realistic Analysis)

ISTOPE	ACTIVITY
I-131	9.7E-03
I-132	9.0E-02
I-133	6.7E-02
I-134	1.8E-01
I-135	9.7E-02
TOTAL	4.4E-01

TABLE 15.6.6-3

FEEDWATER LINE BREAK
RADIOLOGICAL EFFECTS (PUFF RELEASE)

			10 CFR 100		CONSERVATIVE	
			(2 hours)	(30 days)	(2 hours)	(30 days)
A. Exclusion Boundary	(509 meters)	Whole Body Dose (rem)	25	N/A	1.1E-05	--
		Thyroid Dose (rem)	300	N/A	[illegible].4E-03	--
B. Point of Interest	(915 meters)	Whole Body Dose (rem)	N/A	N/A	--	--
		Thyroid Dose (rem)	N/A	N/A	--	--
C. Low Population Zone	(6400 meters)	Whole Body Dose (rem)	N/A	25	N/A	1.3E-06
		Thyroid Dose (rem)	N/A	300	N/A	1.2E-03

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MARCH 1979

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

CHAPTER 16.0*

FSAR SECTION	QUESTION NUMBER				
16.0	031.20	212.15			
16.2	031.180				
16.2.2	031.178	031.179			
16.3	031.187	031.189	031.181	031.185	031.194
	031.199	031.234	031.251	031.254	
16.3.3	031.192	031.193	031.198		
16.3.5	031.202				
16.3.6	031.197				
16.4	031.192	031.184	031.186	031.199	
16.4.5	031.201	031.203			
16.4.6	031.195	031.196	031.200		

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 PRIMARY CONTAINMENT

PRIMARY CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1.1 PRIMARY CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: CONDITIONS 1, 2* and 3.

ACTION:

Without PRIMARY CONTAINMENT INTEGRITY, restore PRIMARY CONTAINMENT INTEGRITY within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.1 PRIMARY CONTAINMENT INTEGRITY shall be demonstrated:

a. At least once per 31 days by verifying that;

   1. All penetrations[1] not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves secured in position, except as provided in Table 3.6.3.1-1 of Specification 3.6.3.1, and

   2. All equipment hatches are closed and sealed.

b. By verifying each containment air lock OPERABLE per Specification 3.6.1.3.

c. By verifying the suppression chamber OPERABLE per Specification 3.6.2.1.

*See Special Test Exception 3.10.1.

[1]Except valves, blind flanges, and deactivated automatic valves which are located inside the containment, and are locked, sealed or otherwise secured in the closed position. These penetrations shall be verified closed during each COLD SHUTDOWN except such verification need not be performed more often than once per 92 days.

PRIMARY CONTAINMENT LEAKAGE

LIMITING CONDITION FOR OPERATION

3.6.1.2 Primary containment leakage rates shall be limited to:

a. An overall integrated leakage rate (excluding MSIV) of:

1. L_a = 0.635 percent by weight of the containment air per 24 hours at P_a, 32.5 psig, or

2. L_t = 0.498 percent by weight of the containment air per 24 hours at a reduced pressure of P_t, 20.0 psig.

b. A combined leakage rate of $\leq$ 0.60 L_a for all penetrations and valves, except for main steam isolation valves, subject to Type B and C tests when pressurized to P_a.

c. 87.7 scf per hour for any one main steam isolation valve when tested at 25 psig.*

APPLICABILITY: When PRIMARY CONTAINMENT INTEGRITY is required per Specification 3.6.1.1.

ACTION:

With:

(a) the measured overall integrated containment leakage rate exceeding 0.75 L_a or 0.75 L_t, as applicable, or

(b) the measured combined leakage rate for all penetrations and valves, except for main steam isolation valves, subject to Type B and C tests exceeding 0.60 L_a, or

(c) the measure leak rate exceeding 87.7 scf per hour for any one main steam isolation valve.

restore:

(a) the overall integrated leakage rate(s) to $\leq$ 0.75 L_a or < 0.75 L_t, as applicable, and

(b) the combined leakage rate for all penetrations and valves, except for main steam isolation valves, subject to Type B and C tests to $\leq$ 0.60 L_a, and

*Exception to Appendix J of 10 CFR 50.

REGULATORY GUIDE 1.108

Initial Issue: Revision 0, August 1976

Current Issue: Revision 1, August 1977

La Salle C.P. Issued: September 10, 1973

PERIODIC TESTING OF DIESEL GENERATORS USED AS ONSITE ELECTRIC POWER SYSTEMS AT NUCLEAR POWER PLANTS

Regulatory Guide 1.108 describes a method acceptable to the NRC for preoperational and periodic testing of diesel electric power units to ensure their availability requirements (0.99 reliability at 50% confidence).

The design of the HPCS diesel-generator units and the standby diesel-generator units enables testing during operation of the plant as well as while the plant is shut down.

The preoperational test program (Table 14.2-36) is designed to show functional compliance to the operational requirements set forth in this guide. A separate demonstration test program is exercised on a one-time basis to show compliance with the availability requirements of this guide.

From these two test programs the following test objectives are covered: initial start; loss of a-c power; rated load; load shedding; load transfer; and, stability of long-term operation.

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Paragraph C.2.c of the August 1977 version of this Regulatory Guide 1.108. The demonstration test program of Paragraphs C.2.a and C.2.b are not repeated every 18 months.

NRC Implementation: Current practice is claimed.

FSAR SECTION/NRC QUESTION CROSS REFERENCE GUIDE:

APPENDIX G*

FSAR SECTION	QUESTION NUMBER			
Appendix G	031.208	212.132	212.135	212.143

*The complete text of the questions and responses is given in the FSAR volumes entitled "Responses to NRC Questions."

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APPENDIX G

REACTOR RECIRCULATION SYSTEM

LIST OF TABLES

APPENDIX G

REACTOR RECIRCULATION SYSTEM

LIST OF FIGURES

.3 Recirculation Pump Seizure Accident

(THIS SECTION DELETED)

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DELETED

APPENDIX K - INTERIM OFFSITE POWER ARRANGEMENT

K.1 INTRODUCTION

Section 8.2 of this FSAR describes the offsite power system that ultimately will connect to the station. It presents the dual 345-kV lines that tie into the Edison grid from each generator unit at La Salle. Each unit has two 345-kV lines with separate system auxiliary transformers. The routing of transmission lines and the criteria and functional ties to MAIN are discussed. That section represents the 1981 interconnections of part of Edison's transmission system. It also shows the single-line drawings of the switchyard with the ultimate configuration of the offsite power system interface with La Salle Station.

Because of transmission right-of-way problems, it is necessary that an interim supply of 138 kV be temporarily brought into La Salle in lieu of one of the 345-kV paired lines. The second pair of 345-kV lines will have temporary terminations, one at Dresden and one at Pontiac Mid Point, instead of the ultimate terminations at Braidwood Station. A description of this interim configuration is provided in this Appendix. By this formatting technique it is Edison's intent to retain the information on the ultimate dual 345-kV lines and update it with current information as progress is made toward its completion. At the same time, this Appendix will be utilized to describe the interim set-up and its details. The comparison of the two systems is enabled such that licensing decisions can be made for both systems and the change-over to the ultimate configuration can be made without further review. This special appendix can then be rescinded.

The station equipment beyond the switchyard has equivalent functions fromeither configuration, hence safety issues are not involved.

K.2 (8.2) OFFSITE POWER SYSTEM

K.2.1 (8.2.1) Description

Electric energy generated at the station is transformed from generator voltage to a nominal 345-kV transmission system voltage by the main power transformers. The main power transformers are connected via intermediate transmission towers to the station's 345-kV transmission terminal consisting of circuit breakers, disconnect switches, buses, support structures, and associated relay protection equipment. The 345-kV terminal is connected to the 138-kV transmission system at La Salle through one 345-kV-138-kV transformer, and a 138-kV transmission terminal. A one-line diagram of the 345-kV and 138-kV bus arrangement is shown in Figure K.2-1. Two 345-kV overhead lines exit the transmission terminal on one right-of-way and are connected to Commonwealth Edison Company's 345-kV system at Dresden Station, and Pontiac Mid Point. Two 138-kV transmission lines are routed on a separate right-of-way as shown in Figure K.2-2 and are connected to Commonwealth Edison Company's 138-kV system at Streator and Mazon/Dresden.

K.2.1.1 (8.2.1.1) Transmission Lines

One 345-kV transmission line to Dresden, one 345-kV transmission line to Pontiac Mid Point, one 138-kV line to Mazon, and one 138-kV line to Streator will be placed in service prior to fuel loading of Unit 1. Figure K.2-3 indicates transmission line routing on the site property, and Figure K.2-4 shows the proximity of other transmission lines.

The 345-kV transmission structures are designed for heavy ice, high wind and broken wire loadings, and dampers are installed on all static wires to control high frequency vibration. The 138-kV line to Mazon/Dresden consists of 3.5 miles of new wood pole construction and 30 miles of steel tower structures. The 138-kV line to Streator consists of 3.5 miles of new wood pole construction and 21.5 miles of steel tower structures.

K.2.1.2 (8.2.1.2) Power Sources

The station's 345-kV transmission terminal buses are continuously energized and serve as the preferred power source for the station's safety loads. Two physically independent lines are provided for the station from the transmission terminal buses. Each line emanates from a separate and distinct bus section, and is brought to the plant via separate intermediate transmission towers. The system auxiliary transformers step the 345-kV system voltage down to the station 4160-volt and 6900-volt power systems. Each system auxiliary transformer is sized to provide the total auxiliary power for one unit plus the ESF auxiliary power for the other unit. In an emergency, there are two breakers to allow 4160-volt switchgear 141y of Unit 1 to be tied to 214y of Unit 2, and two breakers to allow 4160-volt switchgear 142y of Unit 1 to be tied to 242y of Unit 2. This configuration provides the availability of redundant sources of offsite power. In addition, the main generator leads contain removable links that can make a third source of offsite auxiliary power available for each unit by backfeeding the unit auxiliary transformer through the main power transformers. Further discussion concerning the relationship between the station's offsite power system and the onsite auxiliary power system can be found in Subsection 8.3.1.

K.2.1.3 (8.2.1.3) Transmission System

The probability of losing the offsite electric power supply has been minimized by the design of the Commonwealth generation and transmission system. Increased reliability is provided through interconnections to neighboring systems. In 1978, the Commonwealth transmission system consisted, in part, of 74 345-kV lines totaling 2249 miles, and 3 765-kV lines totaling 152 miles. The transmission system is interconnected with neighboring electric utilities over 28 tie lines: 12 at 138 kV, 15 at 345 kV, and 1 at 765 kV.

Commonwealth is a member of Mid-America Interpool Network (MAIN). In general, all electric utilities in Illinois, northern and eastern Missouri, Upper Michigan, and the eastern half of Wisconsin are members of MAIN. The transmission within MAIN currently consists of 125 345-kV lines totaling 4933 miles and 3 765-kV lines totaling 152 miles.

The reliability of the 345-kV transmission grid is demonstrated by the performance data of the 345-kV transmission lines. The average 345-kV line in the MAIN grid experienced 1.85 forced outages per year, with an average duration of 53 hours per forced outage during 1975 through 1977 covering 220 line years of exposure (References 1, 2 and 4). For the 12 years between January 1, 1965, and December 31, 1977, the average Commonwealth 345-kV line experienced 1.9 forced outages per year, with an average duration of 7.8 hours per forced outage. This 13-year period represents 428 line years of experience. The causes of the forced line outages may be summarized as follows:

	% of Forced Outages
a. terminal-related	
1. storm damage	3.4
2. equipment failure	18.4
3. human error	7.3
4. false trip	13.7
5. other	14.5

7. Sudden outage of any transmission station, including all generating capacity associated with such a station.

8. Sudden dropping of a large load or a major load center.

9. Any credible contingency which might lead to system cascading.

"The studies conducted to test the effect of the above contingencies should give due consideration to the following:

a. Steady-state, dynamic and transient stability consideration, including three-phase faults at the most critical locations.

b. The effect of slow fault clearing as a consequence of improper relay operation or failure of a circuit breaker to open.

c. Possible occurrence of the above contingencies not only on the interconnected MAIN network, but also on the network of adjacent power systems, where a major contingency might involve MAIN or portions thereof in a cascading incident.

d. Expected normal and emergency power flow conditions."

The generation and transmission system at Commonwealth is designed to meet all of these criteria.

The capacity of the Commonwealth generation and transmission system to withstand the loss of transmission lines connecting the La Salle 345-kV switchyard to the network has been investigated through stability studies to demonstrate adequacy of the transmission system during conditions before and after the installation of the Braidwood generation and its associated transmission. By 1983, two 1120-MW units will have been installed at Braidwood, and two additional 345-kV lines will emanate from that station.

The studies demonstrated the adequacy of the transmission system under various line contingencies of the La Salle 345-kV lines. Contingencies studied were three-phase faults near the 345-kV switchyard, which are the most severe as concerns the stability of the units. Included were single-line faults with normal clearing of the line protective systems, and abnormal clearing involving the failure of a relay or circuit breaker. All units remained stable throughout all of the line outages mentioned.

For double-line tower faults on the La Salle 345-kV lines, or a single line fault during a planned outage of the other line, Unit 1 will trip and the offsite power will be provided from the 138-kV system via the 345-kV-138-kV transformer.

The output of La Salle County Station will be limited to 700 MWe until the permanent line connections are made to Braidwood-East Frankfort.

K.2.3 (8.2.3) References

1. MAIN report entitled "Summary of MAIN Transmission Line Performance for the year 1975--345 kV and 765 kV."

2. MAIN report entitled "Summary of MAIN Transmission Line Performance for the year 1976--345 kV and 765 kV."

3. MAIN Guide No. 2, "Criteria for Simulation Testing of the Reliability and Adequacy of the MAIN Bulk Power Transmission System."

4. MAIN report entitled, "Summary of MAIN Transmission Line Performance for the Year 1977 - 345 kV and 765 kV."

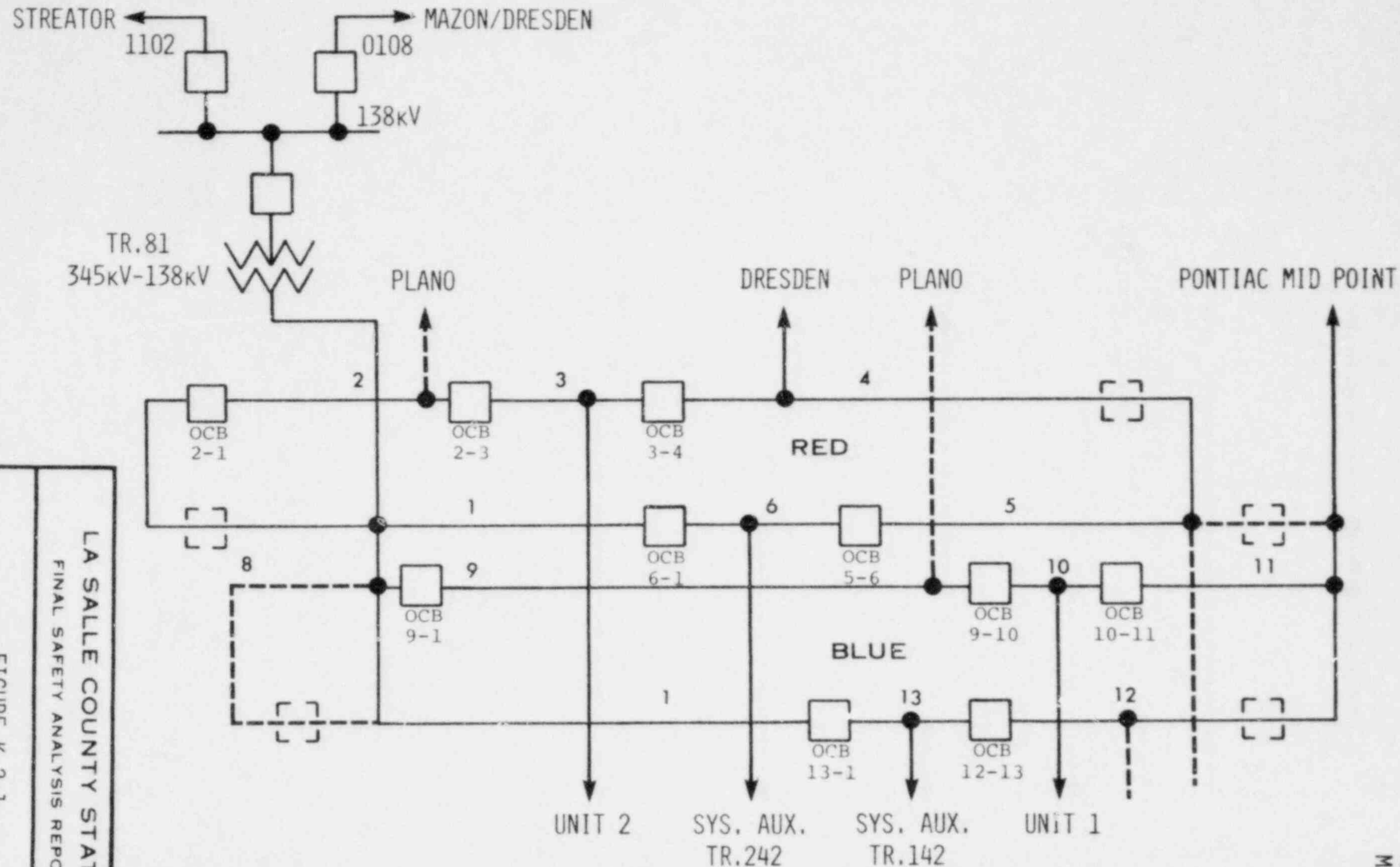

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FIGURE K.2-1
SINGLE-LINE DIAGRAM - 345 AND 138-kV SWITCHYARD

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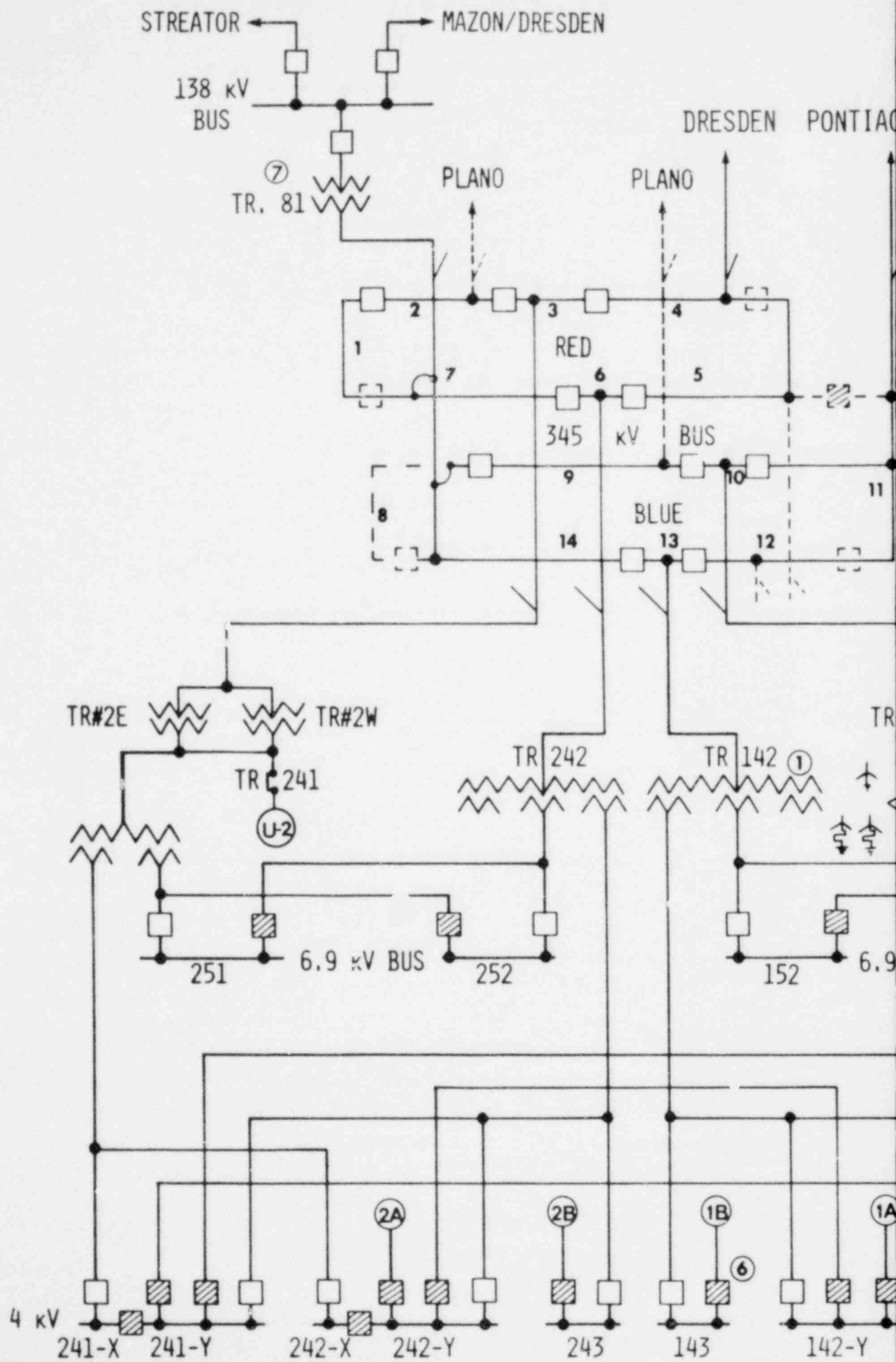
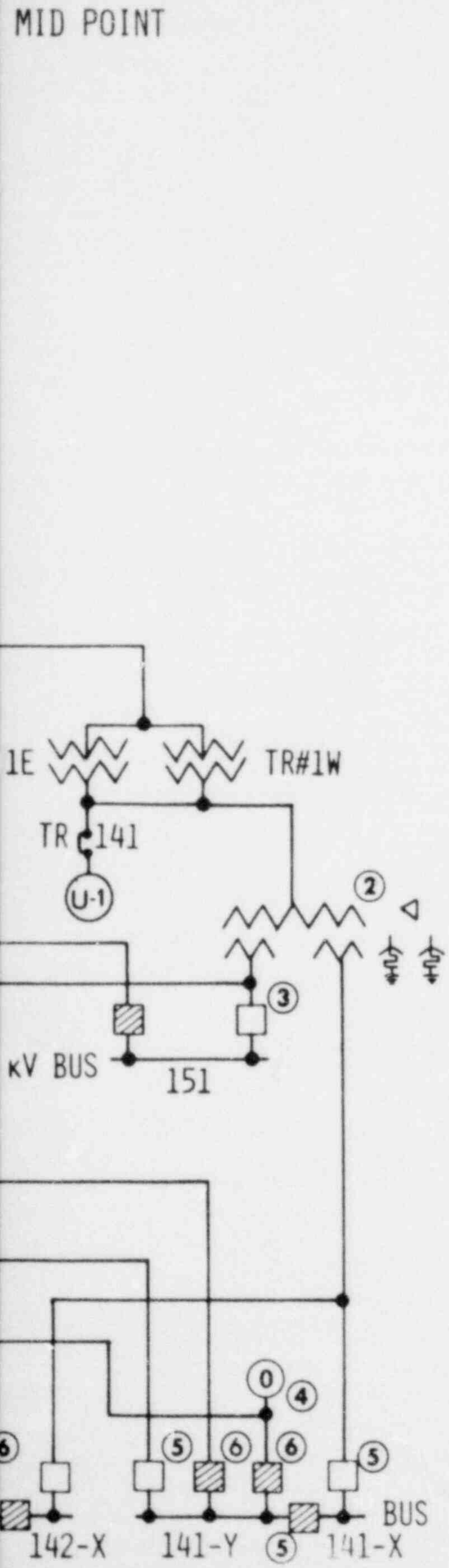


STREATOR
MAZON/DRESDEN
138 KV
BUS
7
TR. 81
PLANO
PLANO
DRESDEN
PONTIAC
1
2
3
4
5
6
7
RED
345 KV BUS
8
9
10
11
12
13
14
BLUE
TR#2E
TR#2W
TR 241
U-2
TR 242
TR 142
1
TR
251
6.9 KV BUS
252
152
6.9
2A
2B
1B
1A
6
4 KV
241-X
241-Y
242-X
242-Y
243
143
142-Y



NOTES

1. 65 MVA 345 Y/199.2 - 6.9Y/3.98 - 4.16Y/2.4 - 4.16 kV 3ϕ SYS. AUX. TR., X (6.9 kV) 36 MVA, Y (4.16 kV) 29 MVA: IMPED. ON 39 MVA BASE: H-X 12.75%, H-Y 18.75%, X-Y 28%. 2 ± 2 1/2% TAPS IN THE 345 kV WINDING.
2. 65 MVA 23.7-6.9Y/3.98 - 4.16Y/2.4 kV 3ϕ UNIT AUX. POWER TR. X (6.9 kV) 36 MVA, Y (4.16 kV) 29 MVA; IMPED. ON 39 MVA BASE: H-X 14.0%, H-Y 19.5%, X-Y 33.5%. 2 ± 2 1/2% TAPS IN 23.7 kV WIND.
3. 500 MVA, 2000 AMP 6.9 kV CIRCUIT BREAKER.
4. 2500 kW, 3125 kVA DIESEL DRIVEN GENERATOR 0.8 P.F, 4.16 kV.
5. 350 MVA, 3000 AMP 4 kV CIRCUIT BREAKER.
6. 350 MVA, 1200 AMP 4 kV CIRCUIT BREAKER.
7. 300 MVA, 345kV-138kV AUTO-TRANSFORMER.

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FIGURE K.2-2

ONE-LINE DIAGRAM STATION AUXILIARY POWER


DRESDEN
MAZON
138 kV
L.7413
138 kV
L.0108
RIVER
ILLINOIS
RIVER
SCREEN
HSE.
138 kV SERVICE
TO PUMPS
138 kV
L.6102
MAKE UP &
BLOW DOWN LINES
COOLING LAKE
BLOW DOWN
WATER DISCHARGE
FLUME
STREATOR
PROPERTY LINE

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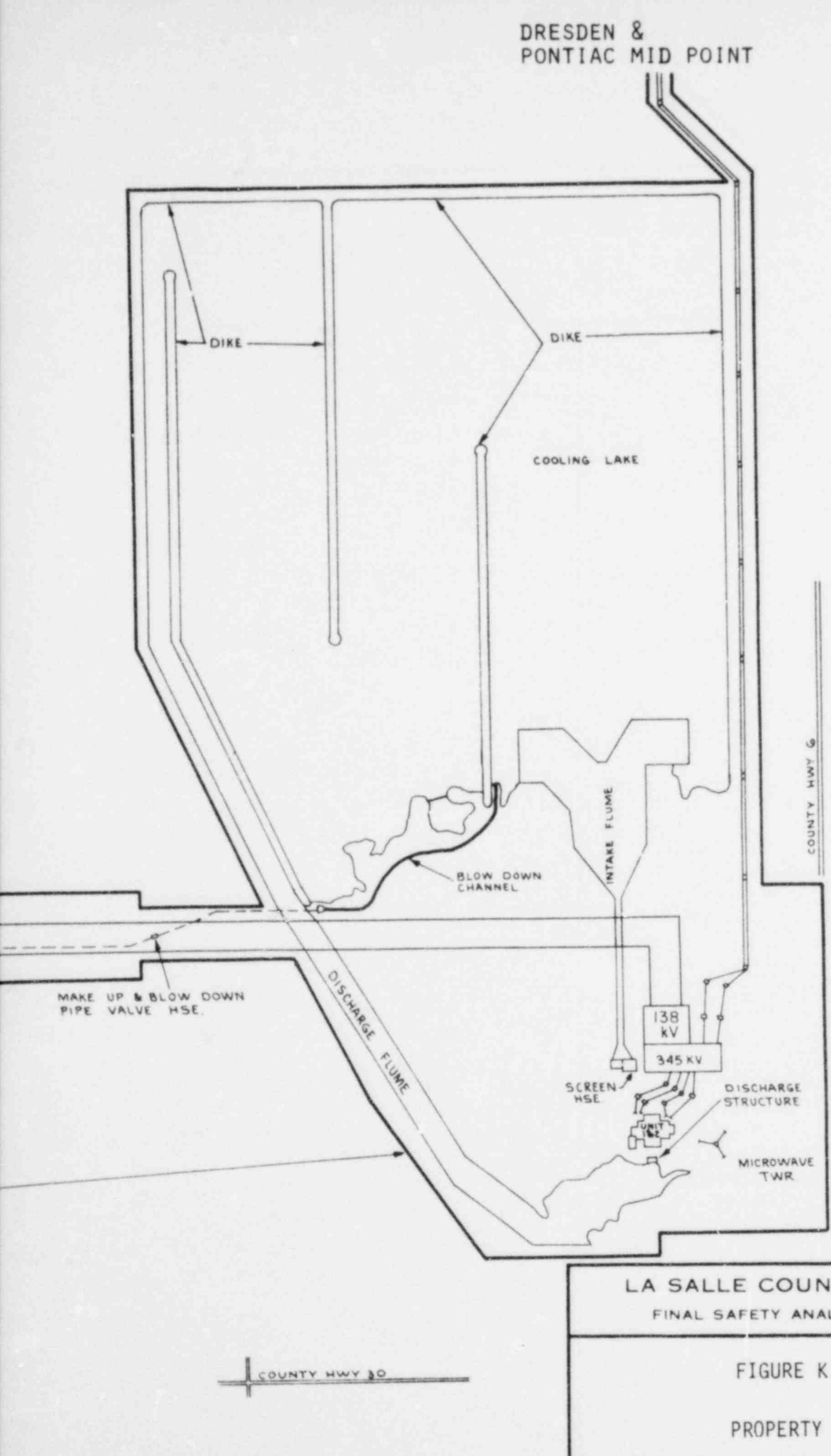

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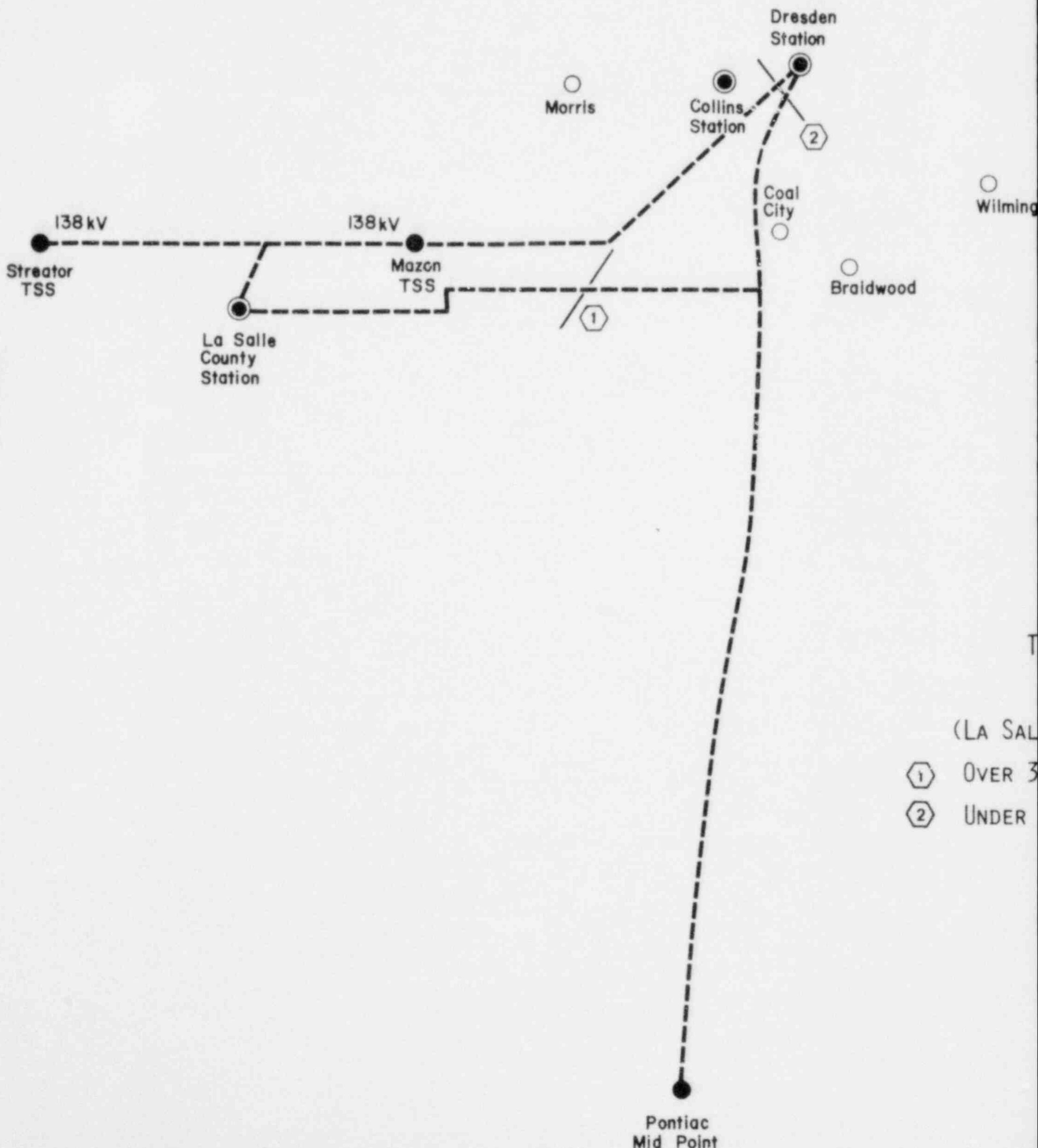
FIGURE K.2-3

PROPERTY PLAN



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(LA SAL

1 OVER 3

2 UNDER

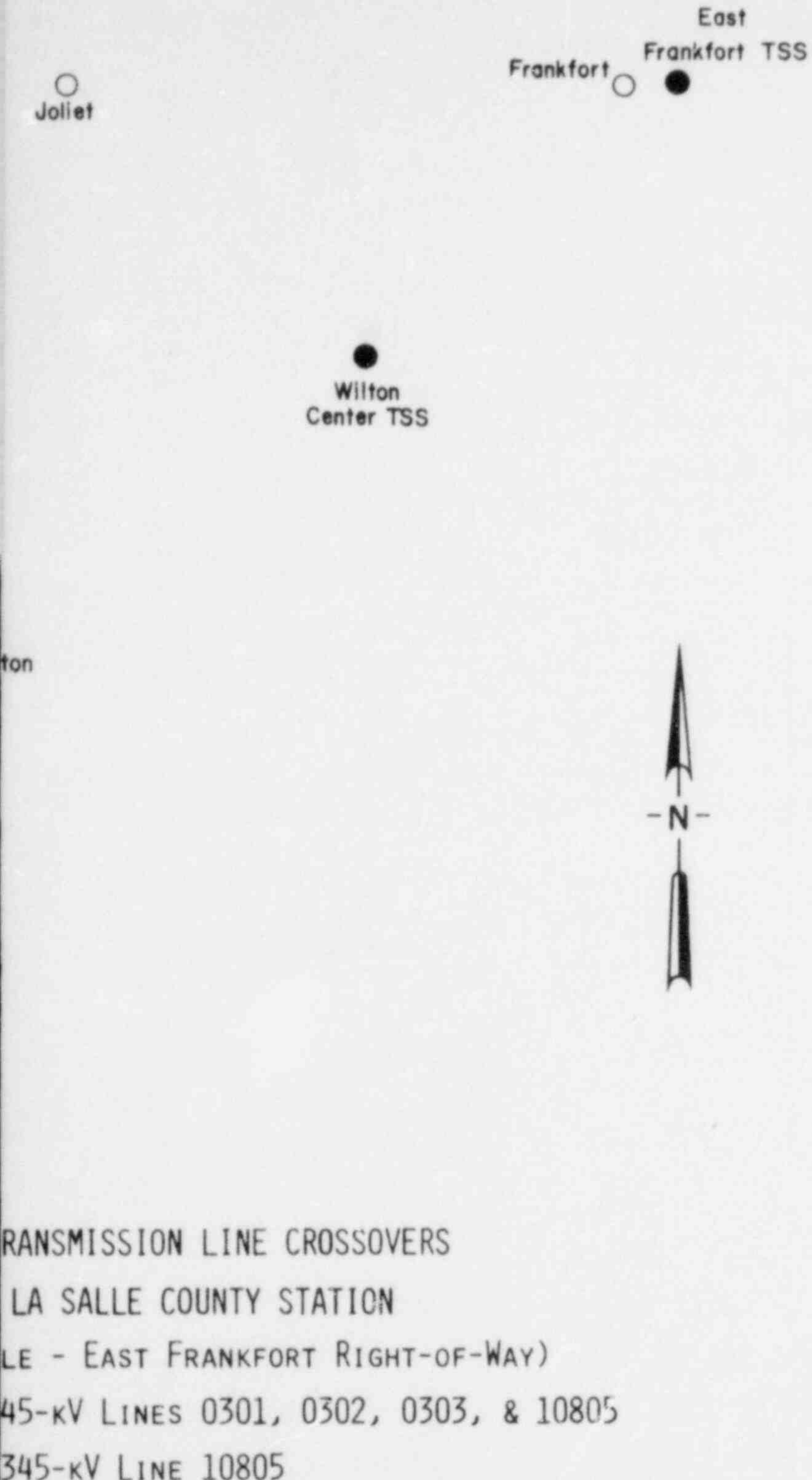

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FIGURE K.2-4

ROUTING OF TRANSMISSION CORRIDORS
1979 CONDITIONS

Q10 AUXILIARY AND POWER CONVERSION SYSTEMS (Cont'd)

QUESTION NUMBER	DATE	APPLICABLE SECTION(s)	PAGE
Q010.24	2-2-78	3.4	Q10.24-1
Q010.25	2-2-78	3.5.1	Q10.25-11
Q010.26	2-2-78	3.6	Q10.26-1
Q010.27	2-2-78	3.6	Q10.27-1
Q010.28	2-2-78	9.1.2	Q10.28-1
Q010.29	2-2-78	9.1.3	Q10.29-1
Q010.30	2-2-78	9.4.1	Q10.30-1
Q010.31	2-2-78	9.0	Q10.31-1
Q010.32	2-16-79	9.5	
Q010.33	2-16-79	9.5	
Q010.34	2-16-79	9.5	
Q010.35	2-16-79	9.5	
Q010.36	2-16-79	9.5	
Q010.37	2-16-79	9.5	
Q010.38	2-16-79	9.5	
Q010.39	2-16-79	9.5	
Q010.40	2-16-79	9.5	
Q010.41	2-16-79	9.5	
Q010.42	2-16-79	9.5	
Q010.43	2-16-79	9.5	
Q010.44	2-16-79	9.5	
Q010.45	2-16-79	9.5	
Q010.46	2-16-79	9.5	
Q010.47	2-16-79	9.5	

Q10 AUXILIARY AND POWER CONVERSION SYSTEMS (Cont'd)

QUESTION 010.23

"The proposed control room area ventilation system does not meet the single failure criteria, in that a failure of one of the intake or exhaust isolation valves or dampers on a high radiation or chlorine gas signal could prevent normal shutdown. Modify your design so that the ventilation system can perform its safety function assuming a single failure."

RESPONSE

The following is a failure analysis for the outside air and exhaust air dampers of the control room HVAC system on high radiation or chlorine detection in the outside air intakes.

One of the redundant HVAC equipment trains and associated dampers is considered in an operational mode (see Figure 9.4-1) for the purpose of explanation.

The minimum outside air dampers OVC01YA, OVC05YA and OVC52YA are installed in series and are designed to automatically close on chlorine detection. All of these dampers will get a signal from chlorine detectors to close thus ensuring the isolation from the outside air while the control room HVAC system operates in a recirculating mode.

The maximum outdoor air dampers OVC08YA and OVC53YA are installed in series and when the system is operating normally, they are deenergized in a closed position together with the exhaust air damper OVC14YA. All of these dampers are energized to open in the purging mode and will get a signal from chlorine, ammonia, and radiation detectors to automatically close.

On high radiation detection in the outside air inlet, outside air dampers OVC05YA and OVC52YA automatically close and the emergency makeup air filter unit fan OVC03CA starts, inducing the outdoor air to flow through the emergency makeup air filter train. Dampers OVC05YA and OVC52YA are installed in series, ensuring closure of the air intake on radiation detection in case of single failure of a damper.

Q30 ELECTRICAL INSTRUMENTATION AND CONTROL SYSTEMS (Cont'd)

QUESTION NUMBER	DATE	APPLICABLE SECTION(s)	PAGE
Q31.232	8-14-78	7.3	Q31.232-1
Q31.233	8-14-78	-	Q31.233-1
Q31.234	8-14-78	16.3	Q31.234-1
Q31.235	8-14-78	6.2.4.2/7.3	Q31.235-1
Q31.236	9-5-78	3.10	Q31.236-1
Q31.237	9-5-78	7.3.2.2	Q31.237-1
Q31.238	9-5-78	6.4/9.4.1	Q31.238-1
Q31.239	9-5-78	9.4	Q31.239-1
Q31.240	10-5-78	7.8	
Q31.241	10-5-78	7.3.2.2	Q31.241-1
Q31.242	10-5-78	9.2	Q31.242-1
Q31.243	10-5-78		Q31.243-1
Q31.244	10-5-78	3.10	Q31.244-1
Q31.245	10-5-78	8.3.1.4	Q31.245-1
Q31.246	10-5-78	7.3.1.1	Q31.246-1
Q31.247	10-5-78	7.3.1.1	Q31.247-1
Q31.248	10-5-78	8.3	Q31.248-1
Q31.249	10-5-78	3.11	Q31.249-1
Q31.250	1-3-79	3.11	
Q31.251	1-3-79	16.3	Q31.251-1
Q31.252	1-3-79	7.2	
Q31.253	1-3-79	7.3	
Q31.254	1-3-79	16.3	Q31.254-1
Q31.255	1-3-79	7.7	

Q30 ELECTRICAL INSTRUMENTATION AND CONTROL SYSTEMS (Cont'd)

QUESTION NUMBER	DATE	APPLICABLE SECTION(s)	PAGE
Q31.256	1-3-79	7.7	
Q31.257	1-3-79	7.7	
Q31.258	1-3-79	3.11	Q31.258-1
Q31.259	1-3-79	6.2.4.2	Q31.259-1
Q31.260	1-3-79	7.3.2.2	
Q31.261	1-10-79	7.4.1	Q31.261-1
Q31.262	1-10-79	7.3.2.7	Q31.262-1

QUESTION 031.258

"State the temperature which was used in the accelerated aging process."

RESPONSE

Accelerated aging of the referenced valve actuators (Question 031.156) was conducted at a temperature of 180° C (356° F).

QUESTION 031.262

"The third paragraph of your response to Question 010.23 contradicts the last paragraph of your response to Question 031.239 and the design criteria for the essential ventilation system which is presented in FSAR Section 7.3.2.7.2.a42.

It also contradicts information which is presented in FSAR Figure 9.4-1 Sheets 1 and 9. Therefore:

(1) Clarify the discrepancies as noted above.

(2) Describe the consequences of a failure of relay OFZ/VC009X to drop out when required.

(3) Modify the design and/or FSAR documentation as is necessary to demonstrate compliance with the requirements of General Design Criteria 19 and 21."

RESPONSE

(1) The response to Question 010.23 and Subsection 7.3.2.7(a.42) have been revised to be consistent with the current design presented in the response to Question 031.239.

(2) Redundant relay is provided to ensure closing of dampers OVCO8YA, OVC53YA, and OVC14YA in the event OF2-VCOO9X fails to drop out when a signal from ammonia, chlorine, or radiation detector is received during purging mode. The following figures are being revised to show this information:

Figure 9.4-1 Sheets 1 and 9

Figure 9.4-2 Sheets 1 and 9

Figure 1E-0-4432

Figure 1E-0-4434

(3) The control room and the auxiliary electric equipment room HVAC system design meets the requirements of General Design Criteria 19 and 21.

Q110 MECHANICAL ENGINEERING (Cont'd)

QUESTION NUMBER	DATE	APPLICABLE SECTION(s)	PAGE
111.68	4-14-78	-	Q111.68-1
111.69	4-14-78	-	Q111.69-1
111.70	4-14-78	-	Q111.70-1
111.71	4-14-78	-	Q111.71-1
111.72	4-14-78	3.6.2	Q111.71-1
111.73	10-5-78	3.9.2	
111.74	10-5-78	3.9, 3.9.2	
111.75	10-5-78	-	Q111.75-1
111.76	10-5-78	-	Q111.76-1
111.77	10-5-78	-	
111.78	10-5-78	3.9.3	
111.79	10-5-78	-	
111.80	10-5-78	3.9.3	
111.81	10-5-78	3.6.2	Q111.81-1
111.82	10-5-78	3.9.3	

QUESTION 111.72

"Your response to our Q111.45 states that your break exclusion piping follows the criteria of Appendix A to Attachment 020-2 of an April 3, 1975, NRC letter to you concerning PSAR Special Report No.3. As you know, La Salle is being reviewed against the NRC Standard Review Plans which were not published until November 24, 1975. We have compared the criteria of the above-mentioned Appendix A against the break exclusion criteria of Brach Technical Position HEB 3-1, attached to SRP Section 3.6.2. We find that the break exclusion criteria of Appendix A, in which you have committed, agrees with the criteria in SRP Section 3.6.2 with one possible exception. Part 6 of Appendix A describes an augmented inservice inspection program for piping within the break exclusion region. This paragraph should be clarified to specify that piping in the break exclusion region will be inspected in accordance with Category B-J of Table IWB-2500 for Class 1 piping and Categories C-F and C-G of Table IWC-2520 for Class 2 piping with the frequency of examination increased beyond the Section XI requirements such that 100% of all weld joints in the process pipe will receive a 100% volumetric examination during each inspection interval. The referenced code tables and categories are defined by the 1974 edition of ASME Section XI including addenda through the 1975 Summer Addendum. We require that you commit to this clarified position on augmented inservice inspection of break exclusion piping which is specified in SRP Sections 3.6.1 and 3.6.2."

RESPONSE

The augmented inservice inspection program described in this question will be implemented on LSCS. In order to clarify those requirements that are above and beyond those of Section XI, the following summary is presented:

a. Table IWB-2500 Category B-J of Section XI requires that only 25% of the circumferential joints and pipe branch connection joints be examined during each inspection interval. The augmented program requires 100% examination of all weld joints in the break exclusion area during each inspection interval.

b. Table IWB-2600, Item numbers B4.7 and B4.8 (Summer of 1975 Addenda), for Category B-J, only require surface examinations of branch pipe connection welds 6-inch diameter and smaller and socket welds. The augmented program requires volumetric examination of these areas.

c. Article IWC-2000 of Section XI requires that Categories C-F and C-G receive 100% volumetric examination of all weld joints only once during the plant life, with partial examinations being performed at each inspection interval to assure all welds are examined by the end of the plant life. The augmented program requires that all weld joints in the exclusion area be examined during each inspection interval.

The preceding summary represents the full extent of the augmented inservice inspection program for break exclusion boundary piping above and beyond that required by ASME Section XI.

QUESTION 111.81

"Your response to 111.72 states that Class 1 piping less than 3 inches in diameter will be exempted from your augmented inspection program for no-break piping in the containment penetration region. Reference to paragraph IWB-1220(b) (1) of ASME Code Section XI (Summer 75 Addenda) is not adequate justification for exempting no-break piping, because the augmented inspection program is not based on Section XI criteria. Provide a commitment to include such piping in the volumetric inservice inspection program for penetration piping or alternatively describe any accessibility problems which prohibit volumetric inspection. For ASME Class 1 no-break piping less than 3 inches in diameter, where volumetric inspection is deemed impractical, provide assurance that if a full circumferential break were to occur anywhere in the uninspectable region, the plant could be safely shut down within 10 CFR Part 100 guidelines assuming a single active failure."

RESPONSE

The following summary is provided to place this inquiry in proper perspective:

a. The LSCS design basis for postulating and evaluating pipe breaks inside and outside containment is Regulatory Guide 1.46 and the A. Giambusso letter of December 15, 1972, respectively, as stated in Section 3.6 and Appendix C. However, since these NRC documents provided no guidance for a break exclusion region, that stated in the J. F. O'Leary letter of July 12, 1973 was utilized. this criteria required only that the piping be "conservatively reinforced and restrained beyond the valve such that...loads will neither impair the operability of the valve nor the integrity of the piping or the containment penetration."

b. Subsequently, additional NRC requirements for the break exclusion area were obtained via the NRC Questions of April 3, 1975 on PSAR Special Report Number 3. These were implemented as described in response to Question 111.45.

c. In Question 111.72, the NRC attempted to impose the additional requirements of Branch Technical Position APCSB 3-1 via the reference to Standard Review Plan 3.6.2 which expanded on the augmented inservice inspection requirements for the break exclusion area. The response to Question 111.72 demonstrated compliance to BTP APCSB 3-1 and BTP MEB 3-1, which required only that the requirements of ASME B&PVC Section XI be extended to provide 100% volumetric examination during each inspection interval.

d. The current question attempts to impose additional requirements on the break exclusion boundary piping, beyond those of Section XI or the BTP's, by requiring that 3-inch and smaller Class 1 piping be subjected to volumetric examination as part of an ever increasing augmented inservice inspection program. Although Section XI is consistently referenced throughout the NRC SRP's and BTP's, this question states that the augmented inservice inspection program is not based on Section XI requirements.

Thus, from a design basis commitment that required simply a conservative design on the break exclusion boundary piping, the requirements have proliferated during the licensing review to a point beyond the NRC's own Standard Review Plans and Branch Technical Positions. Such racheting indicates incomplete or poorly defined NRC treatment of the new subject and a penchant for trivia of no significance to public health and safety.

Only two Class 1 lines on LSCS could be affected by this new requirement, a 3-inch main steam drain line (Penetration M-22) and the 1½-inch standby liquid control discharge line (Penetration M-34).

The standby liquid control line is a moderate energy line for the portion that penetrates primary containment; and therefore, circumferential breaks need not be considered. The maximum postulated through-line leakage crack which could be assumed for this line is comparable in area to the area of the restricting orifices in the reactor coolant pressure boundary instrument lines. Therefore, the analysis to establish whether the plant could be safely shutdown within 10 CFR 100 guidelines for this standby liquid control line is unnecessary because it is bounded by the Instrument Line Failure Analysis already presented in Subsection 15.6.2 where the offsite thyroid dose prediction in less than 3×10^{-4} rem for an instrument line failure. In addition, this piping was a socket welds which cannot be examined by ultrasonic methods.

In conclusion, because the main steam drain line is the only break exclusion boundary line at La Salle which is actually affected by the imposition of this new criteria, and in order to expedite the licensing review, it is agreed that the exemption referenced in the response to Question 111.72

will be deleted. This exemption will not be sought on break exclusion boundary piping. A revised response to Question 111.72 is included, deleting the reference to the exemption stated in paragraph IWB-1220(b)(1) of Section XI.

Q210 REACTOR SYSTEMS (Cont'd)

Q210 REACTOR SYSTEMS (Cont'd)

QUESTION NUMBER	DATE	APPLICABLE SECTION(S)	PAGE
212.135	11-13-78	G.6.3	Q212.135-1
212.136	11-13-78	5.2.2	Q212.136-1
212.137	11-13-78	5.2.5	
212.138	11-13-78	5.2.5	Q212.138-1
212.139	11-13-78	3.5.1	Q212.139-1
212.140	11-13-78	4.6	Q212.140-1
212.141	11-13-78	5.4.6, 15.2	Q212.141-1
212.142	11-13-78	15.1.1	Q212.142-1
212.143	11-13-78	6.3, G.3	Q212.143-1
212.144	11-13-78	15.0	Q212.144-1
212.145	11-13-78		

TABLE Q212.105-1

MODERATE FREQUENCY EVENTS

FSAR SECTION	TRANSIENT	NON-SAFETY GRADE SYSTEM OR COMPONENT
15.1.1	Loss of Feedwater Heating - Manual	None
15.1.1	Loss of Feedwater Heating - Auto	Level 8 turbine trip
15.1.2	Feedwater Controller Failure, Max Demand	Turbine bypass, relief valves
15.1.3	Pressure Regulator Failure, Open	Level 8 turbine trip, turbine bypass, relief valves
15.2.2	Load Rejection	Turbine bypass, relief valves
15.2.3	Turbine Trip	Turbine bypass, relief valves
15.2.4	Closure of All MSIV's	Relief valves
15.2.5	Loss of Condenser Vacuum	Turbine bypass, relief valves
15.2.6	Loss of AC Power	Turbine bypass, relief valves
15.2.7	Loss of All Feedwater Flow	Recirculation runback, relief valves
15.3.1	Trip of Both Recirculation Pumps	Level 8 turbine trip, turbine bypass, relief valves
15.3.2	Recirculation Control Failure, Decreasing Flow	Level 8 turbine trip, turbine bypass, relief valves
15.4.4	Abnormal Startup of Recirculation Pump	Level 8 turbine trip, turbine bypass
15.4.5	Recirculation Control Failure - Increasing Flow	Level 8 turbine trip, turbine bypass
15.5.1	Inadvertent Startup of HPCS	Level 8 turbine trip, turbine bypass

INFREQUENT EVENTS

15.2.3	Turbine Trip w/o Bypass	Relief valves
15.2.2	Load Rejection w/o Bypass	Relief valves

QUESTION 212.128

"Significant dimensional non-conformities were reported for La Salle County Station RHR, HPCS and LPCS pumps which were dismantled to ascertain damage as a result of flooding. The staff is concerned with proper operation of all ECCS pumps; those having dimensional deficiencies add to that concern.

Provide assurance that ECCS pumps will operate as required including the RHR pumps in the long-term post-LOCA cooling mode. Operating histories of identical pumps, in other facilities, in both testing and/or operating modes are required in the justification with due note taken of any differences in conditions under which pumps in other plants operated from the conditions expected for operation the La Salle pumps."

RESPONSE

The Constructor's submittal of a 50.55e report on fiel-disassembled ECCS pumps was based upon field measurements characteristic of horizontal pumps. The alleged nonconformities were not applicable to the specifications for these vertical multistaged pumps. Each ECCS pump had complete acceptable performance test reports showing that the specifications were met, and that performance objectives were fulfilled. These pumps are a new design so there was no prior experience with them among the construction crew.

The pumps have now been reassembled with specification-conforming replacements used in place of damaged or consumed parts. Replacement impellers were purchased for two pumps where manufacturer repaired impellers had previously been accepted.

A special audit of the pump vendor's facility was performed to assure compliance with the approved QA porgram. No significant deficiencies nor deviations were found, several minor record keeping updates were underway following the last NRC audit of this same facility.

Following the September 1977 flood, the ECCS pumps have undergone disassembly, cleaning, rework, repairs, and reassembly. The La Salle RHR Pump A has operated for 113 hours and had an intermittent vibration problem as did RHR Pump C after 53 hours; both pumps have had the bearing housing replaced. RHR Pump C has operated for 291 hours with no problems. The HPCS and LPCS pumps have operated for 27 and 88 hours, respectively.

Operating experience of other similar Ingersoll Rand pumps in nuclear plants is as follows:

Hatch 2	RHR Pump 2A	864 horus
	2B	1112 hours
	2C	629 hours
	2D	569 hours
	LPCS Pump 2A	13.5 hours
	2B	11.8 hours
Chinshan 1	RHR Pump	100 hours
	Core Spray Pump	30 hours
Chinshan 2	RHR Pump	75 hours
	Core Spray Pump	20 hours

No problems have been reported on these pumps.

The vertical pumps used for ECCS functions at La Salle are sized at 7800 to 8400 gpm. They are multistaged axial pumps. A partial list of the application history for similar pumps made by the same vendor is as follows:

Year	Size Range-gpm	Number of Pumps
1963	<4,000	12
1964	<3,000	24
1965	<5,000	32
1966	<4,500	39
1967	<5,000	39
	8,000	3
1968	<6,500	25
	9,000	6
	11,000	9
1969	<6,500	39
	8,000-9,000	9
1970	<6,500	33
	8,000	14
	12,000	6
1971	<6,500	53
	9,000	3
	10,000-12,000	12
1972	6,500	44
	8,000	18
	10,000-12,000	18

1973	<6,500	41
	8,000	8
	10,000-13,800	20
1974	<6,500	32
	8,000	2
	10,000-13,800	30
1975	<7,500	76
	8,500	18
	10,000-13,800	50
1976	8,500	9

Although the operating experience in nuclear applications is just beginning, the postoperating experience in non-nuclear applications with these vertical pumps is very extensive. It indicates that the La Salle ECCS pumps can be expected to operate as required.

In reviewing this table, the generic pump design should be recalled because larger capacity pumps are configured from stages that comprise the smaller capacity pumps. Design refinements are evident in the capacity growth of these stages, whether in single, double, or multiple axial stackups.

QUESTION 212.133

"Your response to Question 212.92 is incomplete. In it you show the times at which cooling is reestablished but no mention is made of the time within which operator action is necessary in order to maintain adequate cooling. Provide the time the operator has to initiate and complete necessary actions in each case."

RESPONSE

Elevation head of water in the reactor vessel was taken to be 5 feet above the steamline nozzles. Suppression pool water is pumped into the vessel by a low pressure pump (RHR-C) until the steamlines are flooded. The resultant enthalpy per pound of homogeneous vessel water is 204 Btu/lb. Saturation temperature of this water is 236° F, and the saturation (dome) pressure is 23.26 psia. The elevation of the relief valve outlet nozzles is about 24 feet below the steamline discharge nozzles, providing a small amount of subcooling at the relief valve inlet nozzle.

Calculation of flow per valve assumes no liquid back-pressure from the relief valve discharge line as the line-flow area is much larger than the port size. Some minor flashing may occur but the effect on back pressure is insignificant. The flashing liquid is handled as such by a correction factor obtained from Fisher Control Handbook page 81.

The flowrate per valve is calculated to be about 1400 gpm under the conditions stated.

See also new Subsection 5.4.7.3.1 and 5.4.7.3.2.

QUESTION 212.143

"You have analyzed the effect on the DBA-LOCA of instantaneous closure of the flow control valve (FCV) in the unbroken loops, in SAR Appendix G, Section 3.1.2. This overly conservative result indicated an increase in peak clad temperature (PCT) of 300 F which, if added to the DBA-LOCA PCT, would be in excess of the maximum PCT criterion of 10 CFR 50.46. Provide an analysis showing the effect of realistic maximum FCV closing rate upon the DBA, indicate which single failure of ESF was taken and discuss the details of the analysis and results."

RESPONSE

Recirculation flow control valve closure is not an expected consequence of a LOCA event. The flow control valve, hydraulic actuator, hydraulic power unit, and the flow control system are classified as inactive components for the LOCA event. As inactive components, operability for the LOCA event is not required and consequently not evaluated. The flow control valve is assumed to remain in the as-is position.

See Subsection G.3.3.3.7 and Attachment G.B.2 to Appendix G.

for a 1 year period (October 1, 1976 through September 30, 1977) was provided in response to Question 372.46. It should be noted that for LSCS operations, the primary meteorological base is the 375-foot wind data and the 33-375 foot temperature gradient data. The second of the two consecutive annual cycles of onsite meteorological data at 375-foot level has been provided in revised Section 2.3.

With respect to the recovery of joint frequency of wind and stability data, it is nearly impossible to achieve 90% data recovery for the following reasons. In order to have valid joint frequency data for a given hour, all three parameters, wind speed, wind direction, and delta-temperature, must be present. If any one entry is missing, the data for that hour cannot be used in a three-way table. In addition, if the wind direction during an hour is non-steady, that is, if the wind is blowing with velocities near, but not less than, the anemometer sensing threshold of the equipment, the numeral 777 is entered in the wind direction field rather than a wind direction entry when the directional vane is not responding. These 777 data, which account for a small percentage of the observations during a year, are treated as missing data when preparing a wind rose table. Thus, the data recovery for a wind rose table is given by:

$$\begin{aligned} \text{Recovery} &= R_{WD} \cdot R_{WS} \cdot R_{T} - L_{777/WD} \\ &= (1 - L_{WD})(1 - L_{WS})(1 - L_{T}) - L_{777/WD} \\ &= 1 - (L_1 + L_2 + L_3) + (L_1L_2 + L_2L_3 + L_1L_3) - \\ &\quad L_1L_2L_3 - L_{777/WD} \end{aligned}$$

where:

R is the recovery fraction for each parameter and L is the fractional data loss for each parameter ($L = 1 - R$) and $L_{777/WD}$ is the loss due to 777 entries in the WD field.

$$L_1 = L_{WD}$$

$$L_2 = L_{WS}$$

$$L_3 = L_T$$

QUESTION 372.22

"Temperature gradient measurement over a layer of 33-feet to 200-feet may not be representative of stability conditions in the layer into which effluents from the stack would be released. Explain the rationale for not measuring temperature gradient over an interval of 33-feet to 375-feet."

RESPONSE

At the time of equipment installation on the La Salle meteorological tower, differential temperature (referenced to 33 feet) was measured at 200-feet to represent stability conditions for the LSCS stack effluent dispersion analysis assuming ground level releases. The differential temperature measurements at 200-feet would also yield conservative estimates of stability conditions if an elevated release were assumed in the dispersion analysis. This concept was applied in this case due to lack of guidance available at that time with regard to stack heights and associated release models.

The as-built LSCS stack is an elevated, continuously emitting point source. Differential temperature measurements at 375-feet (referenced to 33-feet) were initiated on October 1, 1976. Future analyses are expected to more realistically represent actual effluent dispersion from the LSCS stack. Current analyses are relatively more conservative as an upper bound estimate. Analysis utilizing 375-foot level joint frequency data by atmospheric stability (defined by the vertical temperature gradient between the 33-foot and 375-foot levels) for a 2 year period (October 1, 1976 through September 30, 1978) are included in Section 2.3. These analyses realistically represent actual effluent dispersion from the LSCS stack.

In the LSCS-PSAR (Subsection 2.3.6) CECo committed to the initiation of onsite meteorological monitoring 2 years prior to Unit 1 operations.

For LSCS operations, the primary meteorological base is the 375 foot wind data and the 33-375 foot temperature gradient data. The 33-375 foot temperature gradient measurements were initiated on October 1, 1976. Two annual cycles of data for the period October 1, 1976, through September 30, 1978, are provided in revised Section 2.3.