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RADIOLOGICAL IMPACT ASSESSMENT

BROWNS FERRY NUCLEAR PLANT

JULY-DECEMBER, 1975

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Introduction

Potential doses to individuals and populations have been calculated for the time period July 1 through December 31, 1975. The calculations have been made using the measured releases listed in Tables 1 and 2 for radioactivity in both gaseous and liquid effluents. Dispersion in the environment has been calculated using meteorological data and river flow data measured during this period.

Meteorological Data

Meteorological data were measured, and average quarterly joint-frequency distirbutions (JFD's) appropriate for ground-level releases were calculated. The ground-level JFD was derived from wind speeds and directions measured with a sensor located 33 feet above ground level and from the vertical temperature gradient between 33 and 150 feet. Atmospheric stability was classified as indicated in Table 3.

The wind speeds were divided into nine ranges. For calculational purposes, calms were distributed in the lowest wind speed range (0-0.5 mph) according to the directional probabilities in the 0.6-1.4 mph range. The quarterly JFD's are listed in Tables 4 and 5 for ground-level releases. JFD's for elevated releases are not listed because the stack was not operated during this semiannual period.

Gaseous Effluents

The standard ground-level (building wake) dispersion model was used to estimate radioactivity concentrations in the environment. Radionuclides in gaseous effluents were assumed to be released continuously. Dose estimates for external exposure and inhalation were made for a hypothetical adult constantly standing unsheltered at the site boundary. Adult ingestion doses were calculated for radioiodines in leafy vegetables produced at the site boundary, and milk produced at the most critical real cow. Potential child-thyroid ingestion doses from milk ingestion were calculated for the real-cow pathway. The child inhalation dose was calculated assuming constant exposure at the site boundary.

Population doses and average individual doses were calculated for an estimated 627,000 persons living within a 50-mile radius of the plant site. Population ingestion doses were calculated assuming that each individual drinks fresh milk and eats leafy vegetables produced near his residence. For comparison, a population thyroid dose estimate was calculated based on data for milk production within 50 miles of the plant site.

Dose estimates for the gaseous effluents are presented in Tables 6 and 7.

Liquid Effluents

Doses from liquid effluents were calculated using measured hydraulic data. The average river flows at the plant site were 108,000 cfs for the third quarter and 51,200 cfs for the fourth quarter. Radioactivity concentrations in the Tennessee River were calculated assuming that releases in liquid effluents were continuous.

Doses were calculated for recreation, eating fish, and drinking water from public water supplies between the plant site and the mouth of the Tennessee River. The maximum individual dose from drinking water was assumed to be that calculated for the nearest downstream public water supply (Champion Paper Company). The maximum potential recreation dose was calculated for a location immediately downstream from the plant outfall.

Dose estimates for the liquid effluents are presented in Tables 8 and 9.

Direct Radiation

Statistical analysis of thermoluminescent dosimetry (TLD) data accumulated during the third and fourth quarters at onsite and offsite locations has indicated no significant increase in dose rate levels attributable to direct radiation from plant equipment and to gaseous effluents. Large fluctuations in natural background dose rates and in TLD readings tend to mask any small increments which may be due to plant operations.

A project has been initiated to relate reactor power level to direct radiation dose rates offsite using high-pressure ionization chamber measurements. However, because the plant has not operated since March 22, 1975, results of this work are not yet available for estimating dose rates during this reporting period.

Dose Summary

In the third quarter, the maximum site boundary doses were calculated to be 3.1 mrem to the skin and 1.3 mrem to the total body. A potential child's thyroid dose was calculated to be 0.06 mrem. Population doses were estimated to be 7.7 man-rem to the skin and 0.9 man-rem

to the total body. An average individual within a 50-mile radius received an estimated 0.01 mrem to the skin and 0.001 mrem to the total body from radioactive effluents released during the third quarter.

For the fourth quarter, calculations indicated that potential site boundary doses were 0.06 mrem to the skin and 0.02 mrem to the total body. Potential child thyroid doses were calculated to be 0.03 mrem. Potential skin and total body doses to the population were estimated to be 0.11 and 0.02 man-rem, respectively. An average individual within a 50-mile radius received an estimated 0.0002 and 0.00003 mrem to the skin and total body, respectively, from effluents released during the fourth quarter, 1975.

The majority of the doses were due to gaseous effluents released from the plant. The doses from liquid effluents and direct radiation were very small. The potential doses are well below the limits specified in the Browns Ferry Nuclear Plant technical specifications for plant operation.

LIST OF TABLES

TABLE 1

BFNP GASEOUS EFFLUENT RELEASES

Radionuclide	Ground-Level Releases		Elevated Releases	
	Third Quarter, 1975 (Ci)	Fourth Quarter, 1975 (Ci)	Third Quarter, 1975 (Ci)	Fourth Quarter, 1975 (Ci)
H-3	1.56E-01	1.43E-01		
Ar-41	<1.78E+02	<1.59E+00	(The Browns Ferry stack was not operated during this semiannual period).	
Sr-89	1.02E-05	1.46E-06		
Sr-90	1.32E-06	2.93E-06		
Kr-85	<1.45E+04	<2.23E+02		
Kr-85m	<6.52E+01	<7.28E-01		
Kr-87	<9.99E+01	<9.97E-01		
Kr-88	<1.72E+02	<1.70E+00		
I-131	<1.36E-03	<6.30E-04		
I-133	<3.22E-03	<3.61E-03		
I-135	<6.91E-02	<8.72E-02		
Xe-133	<9.52E+01	<9.78E-01		
Xe-135	<6.48E+01	<6.95E-01		
Xe-135m	<2.75E+03	<8.34E+00		
Xe-138	<3.15E+03	<1.35E+01		
Cs-134	<4.27E-03	<8.95E-04		
Cs-137	<1.13E-03	<3.03E-04		
Ba-140	<2.86E-03	<1.53E-03		
La-140	<2.86E-03	<1.53E-03		
Zr-95	<3.00E-03	<5.89E-04		
Nb-95	<4.69E-03	<3.60E-04		
Co-58	<5.56E-03	<2.70E-04		
Mn-54	<3.79E-03	<2.92E-04		
Zn-65	<7.39E-03	<9.40E-04		
Fe-59	<1.20E-03	<4.41E-04		
Co-60	<1.76E-02	<5.85E-04		

TABLE 2

BFNP LIQUID EFFLUENTS RELEASES

Nuclide	Activity (Ci) Third Quarter	Fourth Quarter
H-3	2.8E-00	6.4E-01
Na-24	<4.2E-03	<2.4E-03
Cr-51	<6.5E-02	<3.6E-02
Mn-54	<8.4E-03	<5.0E-03
Mn-56	<1.3E-03	<9.7E-04
Fe-59	<1.4E-02	<7.1E-03
Co-58	<1.8E-02	<1.3E-02
Co-60	<1.6E-02	<1.3E-02
Zn-65	<3.1E-02	<1.6E-02
Sr-89	<1.4E-04	<1.0E-03
Sr-90	<4.7E-04	<2.7E-04
Zr-95	<2.5E-02	<7.0E-03
Nb-95	<2.5E-02	<7.0E-03
Mo-99	<2.7E-03	<3.0E-03
Tc-99m	<2.7E-03	<3.0E-03
I-131	<7.9E-03	<4.3E-03
I-133	<5.8E-03	<3.2E-03
Xe-133	<1.2E-02	<6.7E-03
Cs-134	<1.6E-02	<1.5E-02
Cs-136	<6.4E-03	<3.6E-03
Cs-137	<4.0E-02	<1.5E-02
Ba-140	<2.9E-03	<1.9E-03
La-140	<2.9E-03	<1.9E-03
Ce-141	<1.3E-03	<7.5E-04
Totals	3.1E-00	8.1E-01

TABLE 3

CLASSIFICATION OF ATMOSPHERIC STABILITY

Stability Classification	Ground-Level Releases (building vents) Pasquill Categories	Temperature Change with Height (°C/100m)
Extremely unstable	A	<-1.9
Moderately unstable	B	-1.9 to -1.7
Slightly unstable	C	-1.7 to -1.5
Neutral	D	-1.5 to -0.5
Slightly stable	E	-0.5 to 1.5
Moderately stable	F	1.5 to 4.0
Extremely stable	G	>4.0

Stability Classification	Elevated Releases (stack) TVA Categories	Temperature Change with Height (°C/100m)
Neutral 1	D1	<-1.0
Neutral 2	D2	-1.0 to -0.8
Neutral 3	D3	-0.8 to -0.5
Slightly stable 1	E1	-0.5 to 0.0
Slightly stable 2	E2	0.0 to 0.5
Stable	EF	0.5 to 4.0
Extremely stable	G	>4.0

TABLE 4

BROWNS FERRY NUCLEAR PLANT METFOROLOGICAL DATA*

JOINT FREQUENCY DISTRIBUTION IN PRECENT

GROUND-LEVEL RELEASES - THIRD QUARTER, 1975

STABILITY CLASS A

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.0	0.0	0.0	0.090	0.090	0.090	0.0	0.0
NNE	0.0	0.0	0.0	0.0	0.0	0.460	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.0	0.090	0.0	0.0	0.0
ENE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.280	1.480	0.280	0.140	0.0	0.0	0.0
SSE	0.0	0.0	0.320	0.920	0.050	0.050	0.0	0.0	0.0
S	0.0	0.0	0.090	0.280	0.050	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.0	0.090	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.050	0.0	0.140	0.0	0.0	0.0	0.0
W	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.0	0.050	0.0	0.280	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.0	0.0	0.230	0.140	0.0	0.0
NNW	0.0	0.0	0.0	0.0	0.0	0.090	0.370	0.0	0.0
TOTALS	0.0	0.0	0.840	2.870	0.660	1.430	0.600	0.0	0.0

STABILITY CLASS B

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.0	0.0	0.090	0.050	0.370	0.0	0.0	0.0
NNE	0.0	0.0	0.0	0.140	0.140	0.320	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.050	0.180	0.050	0.0	0.0	0.0
ENE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.050	0.050	0.050	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.650	0.830	0.140	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.510	0.140	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.0	0.280	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.050	0.050	0.050	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.050	0.0	0.090	0.0	0.0	0.0
WNW	0.0	0.0	0.050	0.180	0.180	0.230	0.090	0.0	0.0
NW	0.0	0.0	0.050	0.230	0.050	0.370	0.140	0.0	0.0
NNW	0.0	0.0	0.0	0.0	0.140	0.230	0.230	0.0	0.0
TOTALS	0.0	0.0	1.460	2.090	0.980	1.660	0.460	0.0	0.0

*Lost Record = 4.0 percent
Percent calm in each stability class appears as total under first wind speed.

TABLE 4 (Continued)

STABILITY CLASS C

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.0	0.0	0.140	0.180	0.370	0.050	0.0	0.0
NNE	0.0	0.0	0.0	0.140	0.090	0.090	0.0	0.0	0.0
NE	0.0	0.0	0.0	0.0	0.050	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.050	0.140	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.0	0.140	0.050	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.320	0.140	0.050	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.180	0.140	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.050	0.0	0.140	0.0	0.0
WNW	0.0	0.0	0.140	0.090	0.0	0.050	0.140	0.0	0.0
NW	0.0	0.0	0.090	0.140	0.090	0.090	0.280	0.0	0.0
NNW	0.0	0.0	0.0	0.090	0.090	0.090	0.420	0.0	0.0
TOTALS	0.0	0.0	0.880	1.260	0.650	0.690	1.030	0.0	0.0

STABILITY CLASS D

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.0	0.140	0.600	0.740	2.030	0.280	0.0	0.0
NNE	0.0	0.0	0.280	0.280	0.550	0.370	0.0	0.0	0.0
NE	0.0	0.0	0.550	0.370	0.180	0.140	0.090	0.0	0.0
ENE	0.0	0.050	0.650	0.420	0.0	0.050	0.0	0.0	0.0
E	0.0	0.0	0.320	0.320	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.600	0.790	0.420	0.600	0.0	0.0	0.0
SE	0.0	0.050	1.430	0.690	0.230	0.510	0.0	0.0	0.0
SSE	0.0	0.050	0.790	0.460	0.0	0.050	0.0	0.0	0.0
S	0.0	0.0	0.600	0.880	0.090	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.050	0.180	0.050	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.090	0.090	0.050	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.230	0.420	0.320	0.280	0.140	0.0	0.0
W	0.0	0.0	0.510	0.920	0.920	1.110	0.140	0.0	0.0
WNW	0.0	0.0	0.140	0.230	0.420	0.690	0.230	0.0	0.0
NW	0.0	0.0	0.090	0.230	0.280	0.690	0.370	0.0	0.0
NNW	0.0	0.0	0.180	0.140	0.600	3.140	1.340	0.050	0.0
TOTALS	0.0	0.150	6.650	7.020	4.850	9.660	2.590	0.050	0.0

TABLE 4 (Continued)

STABILITY CLASS E

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.180	0.230	0.550	0.420	0.460	0.0	0.0	0.0
NNE	0.0	0.0	0.920	0.320	0.230	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.790	0.550	0.180	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.510	0.280	0.140	0.0	0.0	0.0	0.0
E	0.0	0.0	1.060	0.650	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	1.160	1.430	0.550	0.0	0.0	0.0	0.0
SE	0.0	0.180	2.400	2.630	0.830	0.370	0.0	0.0	0.0
SSE	0.0	0.140	0.880	0.690	0.090	0.050	0.0	0.0	0.0
S	0.0	0.050	0.650	0.370	0.600	0.180	0.0	0.0	0.0
SSW	0.0	0.050	0.230	0.140	0.320	0.050	0.0	0.0	0.0
SW	0.0	0.0	0.090	0.0	0.050	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.090	0.050	0.0	0.0	0.0	0.0	0.0
W	0.0	0.050	0.280	0.180	0.050	0.090	0.0	0.0	0.0
WNW	0.0	0.0	0.140	0.090	0.140	0.0	0.0	0.0	0.0
NW	0.0	0.0	0.050	0.180	0.0	0.050	0.0	0.0	0.0
NNW	0.0	0.050	0.370	0.830	0.280	0.180	0.140	0.0	0.0
TOTALS	0.0	0.700	9.850	8.940	3.880	1.430	0.140	0.0	0.0

STABILITY CLASS F

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.050	0.180	0.460	0.140	0.0	0.0	0.0	0.0
NNE	0.0	0.0	0.230	0.180	0.090	0.0	0.0	0.0	0.0
NE	0.0	0.0	0.460	0.230	0.140	0.0	0.0	0.0	0.0
ENE	0.0	0.090	0.550	0.140	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	1.620	0.600	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.050	1.160	0.600	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.280	2.540	1.160	0.230	0.0	0.0	0.0	0.0
SSE	0.0	0.180	0.970	0.420	0.180	0.140	0.0	0.0	0.0
S	0.0	0.140	0.550	0.230	0.420	0.050	0.0	0.0	0.0
SSW	0.0	0.090	0.090	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.180	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.180	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0	0.0
NNW	0.0	0.0	0.370	0.280	0.0	0.0	0.0	0.0	0.0
TOTALS	0.0	0.880	9.130	4.350	1.200	0.190	0.0	0.0	0.0

TABLE 4 (Continued)

STABILITY CLASS G

SECTOR	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR) 0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.38 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
N	0.0	0.140	0.420	0.0	0.0	0.0	0.0	0.0	0.0
NNE	0.0	0.090	0.880	0.140	0.0	0.0	0.0	0.0	0.0
NE	0.0	0.180	0.600	0.0	0.0	0.0	0.0	0.0	0.0
ENE	0.0	0.050	0.600	0.090	0.0	0.0	0.0	0.0	0.0
E	0.0	0.090	1.340	0.230	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.050	0.600	0.050	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.230	1.390	0.140	0.0	0.0	0.0	0.0	0.0
SSE	0.0	0.370	1.110	0.280	0.140	0.050	0.0	0.0	0.0
S	0.0	0.230	0.550	0.050	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.090	0.090	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.090	0.050	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.140	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NNW	0.0	0.090	0.140	0.050	0.0	0.0	0.0	0.0	0.0
TOTALS	0.0	1.890	7.770	1.030	0.140	0.050	0.0	0.0	0.0

TABLE 5

BROWNS FERRY NUCLEAR PLANT METEOROLOGICAL DATA*

JOINT FREQUENCY DISTRIBUTION IN PERCENT

GROUND-LEVEL RELEASES - FOURTH QUARTER, 1975

STABILITY CLASS A

WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)

SECTOR	0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.88 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
N	0.0	0.0	0.0	0.240	0.140	0.240	0.0	0.0	0.0
NNE	0.0	0.0	0.140	0.140	0.0	0.240	0.0	0.0	0.0
NE	0.0	0.0	0.050	0.190	0.090	0.050	0.0	0.0	0.0
ENE	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.0	0.570	0.330	0.050	0.0	0.0	0.0
SE	0.0	0.0	0.190	2.450	0.420	0.090	0.0	0.0	0.0
SSE	0.0	0.0	0.330	1.790	0.140	0.0	0.0	0.0	0.0
S	0.0	0.0	0.190	1.180	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.0	0.050	0.050	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.380	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.140	0.050	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.090	0.0	0.050	0.190	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.090	0.0	0.330	0.0	0.0	0.0
NNW	0.0	0.0	0.0	0.0	0.050	0.140	0.0	0.0	0.0
TOTALS	0.0	0.0	1.040	7.320	1.370	1.330	0.0	0.0	0.0

STABILITY CLASS B

WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)

SECTOR	0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.88 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
N	0.0	0.0	0.050	0.280	0.140	0.140	0.050	0.0	0.0
NNE	0.0	0.0	0.140	0.190	0.280	0.090	0.0	0.0	0.0
NE	0.0	0.0	0.090	0.090	0.050	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.0	0.090	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.050	0.190	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.380	0.660	0.0	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.610	0.610	0.050	0.0	0.0	0.0	0.0
S	0.0	0.0	0.140	0.760	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.140	0.190	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.140	0.240	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.710	0.050	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.240	0.330	0.050	0.0	0.0	0.0
WNW	0.0	0.0	0.0	0.240	0.520	0.520	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.140	0.280	0.900	0.0	0.0	0.0
NNW	0.0	0.0	0.0	0.050	0.520	0.470	0.0	0.0	0.0
TOTALS	0.0	0.0	1.790	4.590	2.310	2.170	0.050	0.0	0.0

*Lost Record = 2.0 percent

Percent calm in each stability class appears as total under first wind speed.

TABLE 5 (Continued)

STABILITY CLASS C

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.0	0.0	0.050	0.140	0.050	0.050	0.0	0.0
NNE	0.0	0.0	0.050	0.050	0.050	0.140	0.0	0.0	0.0
NE	0.0	0.0	0.190	0.0	0.0	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.0	0.0	0.050	0.0	0.0	0.0	0.0
E	0.0	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.050	0.140	0.140	0.0	0.0	0.0	0.0
SE	0.0	0.0	0.470	0.140	0.090	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.380	0.050	0.0	0.0	0.0	0.0	0.0
S	0.0	0.0	0.240	0.140	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.090	0.050	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.050	0.140	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.090	0.280	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.280	0.090	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.0	0.190	0.240	0.050	0.0	0.0	0.0
NW	0.0	0.0	0.0	0.140	0.090	0.610	0.140	0.0	0.0
NNW	0.0	0.0	0.0	0.090	0.330	0.420	0.050	0.050	0.0
TOTALS	0.0	0.0	1.610	1.790	1.220	1.270	0.240	0.050	0.0

STABILITY CLASS D

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13	0.45	1.10	1.99	2.88	4.45	6.91	9.59	13.00
	0.0-0.5	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18	19-24	GT 24
SECTOR									
N	0.0	0.050	0.280	0.520	0.570	0.520	0.050	0.0	0.0
NNE	0.0	0.0	0.380	0.610	0.420	0.240	0.0	0.0	0.0
NE	0.0	0.0	0.570	0.570	0.240	0.0	0.0	0.0	0.0
ENE	0.0	0.0	0.190	0.090	0.0	0.050	0.0	0.0	0.0
E	0.0	0.0	0.050	0.140	0.090	0.050	0.0	0.0	0.0
ESE	0.0	0.0	0.760	0.760	0.380	0.330	0.0	0.0	0.0
SE	0.0	0.050	1.270	1.130	0.380	0.380	0.0	0.0	0.0
SSE	0.0	0.0	1.510	0.610	0.090	0.0	0.0	0.0	0.0
S	0.0	0.0	1.230	0.380	0.050	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.710	0.240	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.610	0.190	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	1.040	0.850	0.190	0.0	0.0	0.0	0.0
W	0.0	0.0	0.570	1.320	0.660	0.0	0.0	0.0	0.0
WNW	0.0	0.0	0.050	0.660	0.280	0.090	0.0	0.0	0.0
NW	0.0	0.0	0.050	0.240	0.380	0.280	0.140	0.0	0.0
NNW	0.0	0.0	0.380	0.710	0.520	0.240	0.050	0.0	0.0
TOTALS	0.0	0.100	9.650	9.020	4.250	2.180	0.240	0.0	0.0

TABLE 5 (Continued)

STABILITY CLASS E

WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)

SECTOR	0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.88 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
N	0.0	0.140	0.990	0.610	0.420	0.420	0.0	0.0	0.0
NNE	0.0	0.050	0.330	0.380	0.140	0.190	0.0	0.0	0.0
NE	0.0	0.090	0.570	0.420	0.090	0.280	0.0	0.0	0.0
ENE	0.0	0.050	1.040	0.190	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	0.900	0.990	0.190	0.050	0.0	0.0	0.0
ESE	0.0	0.0	0.850	1.370	0.850	0.710	0.0	0.0	0.0
SE	0.0	0.090	2.080	1.930	0.710	0.420	0.0	0.0	0.0
SSE	0.0	0.0	0.610	0.140	0.190	0.0	0.0	0.0	0.0
S	0.0	0.090	0.800	0.240	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.050	0.940	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.090	0.710	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.050	1.040	0.280	0.0	0.050	0.0	0.0	0.0
W	0.0	0.050	0.850	1.180	0.090	0.0	0.0	0.0	0.0
WNW	0.0	0.050	0.050	0.240	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.190	0.380	0.280	0.0	0.090	0.0	0.0	0.0
NNW	0.0	0.050	0.990	0.330	0.190	0.0	0.0	0.0	0.0
TOTALS	0.0	1.040	13.180	8.580	2.870	2.210	0.0	0.0	0.0

STABILITY CLASS F

WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)

SECTOR	0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.88 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
N	0.0	0.190	0.850	0.140	0.190	0.0	0.0	0.0	0.0
NNE	0.0	0.050	0.940	0.140	0.090	0.0	0.0	0.0	0.0
NE	0.0	0.090	0.800	0.240	0.050	0.0	0.0	0.0	0.0
ENE	0.0	0.050	1.420	0.050	0.0	0.0	0.0	0.0	0.0
E	0.0	0.0	1.270	0.660	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.050	0.520	0.090	0.050	0.0	0.0	0.0	0.0
SE	0.0	0.090	0.190	0.090	0.0	0.0	0.0	0.0	0.0
SSE	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
S	0.0	0.190	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.140	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.0	0.090	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.050	0.190	0.0	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.050	0.140	0.050	0.0	0.0	0.0	0.0	0.0
NNW	0.0	0.090	0.470	0.420	0.090	0.0	0.0	0.0	0.0
TOTALS	0.0	0.900	7.070	1.880	0.470	0.0	0.0	0.0	0.0

TABLE 5 (Continued)

STABILITY CLASS G

	WIND SPEED (METERS/SEC) AND RANGE (MILES/HR)								
	0.13 0.0-0.5	0.45 0.6-1.4	1.10 1.5-3.4	1.99 3.5-5.4	2.80 5.5-7.4	4.45 7.5-12.4	6.91 12.5-18	9.59 19-24	13.00 GT 24
SECTOR									
N	0.0	0.520	1.460	0.240	0.050	0.0	0.0	0.0	0.0
NNE	0.0	0.240	0.940	0.090	0.050	0.0	0.0	0.0	0.0
NE	0.0	0.140	0.710	0.0	0.0	0.0	0.0	0.0	0.0
ENE	0.0	0.050	1.270	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	0.050	0.420	0.140	0.0	0.0	0.0	0.0	0.0
ESE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SE	0.0	0.090	0.090	0.0	0.0	0.0	0.0	0.0	0.0
SSE	0.0	0.050	0.090	0.0	0.0	0.0	0.0	0.0	0.0
S	0.0	0.050	0.090	0.0	0.0	0.0	0.0	0.0	0.0
SSW	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
SW	0.0	0.140	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WSW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WNW	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NW	0.0	0.140	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NNW	0.0	0.420	0.470	0.090	0.050	0.0	0.0	0.0	0.0
TOTALS	0.0	1.940	5.590	0.560	0.150	0.0	0.0	0.0	0.0

TABLE 6

BFNP GASEOUS EFFLUENT DOSES - THIRD QUARTER 1975*

Adult	Total Body (mrem)	Skin (mrem)	Thyroid (mrem)	Lung (mrem)	GIT (mrem)	Bone (mrem)
Submersion	1.20E+00	3.05E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00
Inhalation	1.37E-02	1.37E-02	1.76E-02	4.46E-02	1.37E-02	2.21E-03
Ingestion	1.93E-04	1.93E-04	1.77E-02	1.93E-04	2.27E-04	1.98E-04
Ground	5.50E-02	6.40E-02	5.50E-02	5.50E-02	5.50E-02	5.50E-02
Total	1.27E+00	3.13E+00	1.29E+00	1.30E+00	1.27E+00	1.26E+00
Child						
Inhalation[a]			7.19E-03			
Ingestion[b]			5.01E-02			
Total			5.73E-02			
Population	Total Body (man-rem)	Skin (man-rem)	Thyroid (man-rem)	Lung (man-rem)	GIT (man-rem)	Bone (man-rem)
Submersion	6.58E-01	7.40E+00	6.58E-01	6.58E-01	6.58E-01	6.58E-01
Inhalation	1.25E-02	1.25E-02	2.62E-02	1.67E-01	1.25E-02	2.79E-03
Ingestion	1.77E-03	1.77E-03	1.40E-01	1.77E-03	1.66E-03	1.81E-03
Ground	2.27E-01	2.66E-01	2.27E-01	2.27E-01	2.27E-01	2.27E-01
Total	8.99E-01	7.68E+00	1.05E+00	1.05E+00	8.99E-01	8.90E-01
Average Individual (mrem)	1.43E-03	1.22E-02	1.67E-03	1.68E-03	1.43E-03	1.42E-03

a. Site boundary, south sector, 2500 meters.
b. Real cow location, SSW sector, 4720 meters.
c. Population thyroid dose = 6.71E-02 man-rem based on milk production data.
* Calculations based on effluent monitoring data and NRC building-wake dispersion model.

TABLE 7

BFNP GASEOUS EFFLUENT DOSES - FOURTH QUARTER 1975*

Adult[a]	Total Body (mrem)	Skin (mrem)	Thyroid (mrem)	Lung (mrem)	GIT (mrem)	Bone (mrem)
Submersion	1.64E-02	5.86E-02	1.64E-02	1.64E-02	1.64E-02	1.64E-02
Inhalation	2.88E-04	2.88E-04	8.96E-04	1.77E-03	2.88E-04	2.60E-04
Ingestion	2.90E-04	2.90E-04	1.96E-02	2.90E-04	4.03E-04	2.95E-04
Ground	4.56E-03	5.35E-03	4.56E-03	4.56E-03	4.56E-03	4.56E-03
Total	2.15E-02	6.45E-02	4.15E-02	2.30E-02	2.17E-02	2.15E-02
Child						
Inhalation[a]			1.10E-02			
Ingestion[b]			1.70E-02			
Total			2.80E-02			
Population	Total Body (man-rem)	Skin (man-rem)	Thyroid (man-rem)	Lung (man-rem)	GIT (man-rem)	Bone (man-rem)
Submersion	5.56E-03	9.86E-02	5.56E-03	5.56E-03	5.56E-03	5.56E-03
Inhalation	4.52E-04	4.52E-04	1.29E-02	4.18E-03	4.52E-04	6.49E-04
Ingestion	1.42E-03	1.42E-03	7.92E-02	1.42E-03	1.52E-03	1.44E-03
Ground	1.19E-02	1.39E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02
Total	1.93E-02	1.14E-01	1.10E-01	2.31E-02	1.94E-02	1.95E-02
Average Individual (mrem)	3.08E-05	1.82E-04	1.75E-04	3.68E-05	3.10E-05	3.12E-05

a. Site boundary, NNW sector, 1480 meters.
b. Real cow location, SSW, 4720 meters.
c. Population thyroid dose = 4.02E-02 man-rem based only on milk production data.
* Calculations based on effluent monitoring data and the NRC building-wake dispersion model.

TABLE 8

LIQUID EFFLUENT DOSES - THIRD QUARTER 1975

	Bone	G.I. Tract	Thyroid	Total Body	Skin	
I. Water Ingestion						
A. Maximum Individual Dose Champion Paper Company	<3.4E-04	<3.6E-04	<6.3E-04	<2.1E-04	<2.1E-04	mrem
B. Total Population Dose Tennessee River	<2.0E-02	<1.8E-02	<1.7E-02	<1.3E-02	<1.3E-02	man-rem
II. Fish Consumption						
A. Maximum Individual Dose Wheeler Lake below Browns Ferry	<9.4E-03	<3.6E-02	<1.2E-02	<1.1E-02	<1.1E-02	mrem
B. Total Population Dose Tennessee River	<8.8E-01	<3.3	<1.1	<1.1	<1.1	man-rem

	In-Water		Above-Water		Shoreline		
	Total Body	Skin	Total Body	Skin	Total Body	Skin	
III. Recreation							
A. Maximum Individual Dose Wheeler Lake below Browns Ferry	<5.1E-05	<1.1E-04	<5.0E-05	<1.1E-04	<1.0E-02	<1.2E-02	mrem
B. Total Population Dose Tennessee River	<1.9E-04	<4.0E-04	<4.9E-04	<1.0E-03	<1.2E-01	<1.4E-01	man-rem

	Bone	G.I. Tract	Thyroid	Total Body	Skin	
IV. Total Tennessee River Population Dose	<1.0	<3.4	<1.2	<1.2	<1.3	man-rem

TABLE 9

LIQUID EFFLUENT DOSES - FOURTH QUARTER 1975

	Bone	G.I. Tract	Thyroid	Total Body	Skin	
I. Water Ingestion						
A. Maximum Individual Dose Champion Paper Company	<1.3E-04	<1.5E-04	<2.7E-04	<9.0E-05	<9.0E-05	mrem
B. Total Population Dose Tennessee River	<7.0E-03	<6.7E-03	<7.5E-03	<4.7E-03	<4.7E-03	man-rem
II. Fish Consumption						
A. Maximum Individual Dose Wheeler Lake Below Browns Ferry	<3.5E-03	<9.6E-03	<5.3E-03	<5.0E-03	<5.0E-03	mrem
B. Total Population Dose Tennessee River	<3.1E-01	<8.3E-01	<4.5E-01	<4.4E-01	<4.4E-01	man-rem

	In-Water		Above-Water		Shoreline		
	Total Body	Skin	Total Body	Skin	Total Body	Skin	
III. Recreation							
A. Maximum Individual Dose Wheeler Lake below Browns Ferry	<4.7E-06	<1.0E-05	<4.7E-06	<1.0E-05	<8.7E-04	<1.0E-03	mrem
B. Total Population Dose Tennessee River	<1.6E-05	<3.4E-05	<4.1E-05	<8.8E-05	<9.1E-03	<1.1E-02	man-rem

	Bone	G.I. Tract	Thyroid	Total Body	Skin	
IV. Total Tennessee River Population Dose	<3.3E-01	<8.5E-01	<4.7E-01	<4.5E-01	<4.6E-01	man-rem