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May 14, 2012

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

SUBJECT: 2011 Radioactive Effluent Release Report  
Vermont Yankee Nuclear Power Station  
Docket No. 50-271  
License No. DPR-28

Dear Sir or Madam,

In accordance with Vermont Yankee (VY) Technical Specifications (TS) 6.6.D, attached is a copy of the annual 2011 Radioactive Effluent Release Report.

In addition, VY TS 6.7.B requires reporting of changes to the Off-Site Dose Calculation Manual (ODCM). The changes made to the ODCM during 2011 are provided in Appendix H of the subject report.

There are no new regulatory commitments being made in this submittal.

Should you have any questions or require additional information concerning this submittal, please contact me at (802) 451-3166.

Sincerely,

[RJW/JTM]

Attachment: 1. Radioactive Effluent Release Report for 2011  
2. Offsite Dose Calculation Manual, Revision 34

cc listing (next page)

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RADIOACTIVE EFFLUENT  
RELEASE REPORT  
FOR 2011  
INCLUDING ANNUAL RADIOLOGICAL  
IMPACT ON MAN

Entergy Nuclear Vermont Yankee, LLC  
Docket No. 50-271  
License No. DPR-28

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# **Radiological Effluent Release Report for 2011**

[Including Annual Radiological Impact on Man]

Entergy Nuclear Vermont Yankee, LLC

## **1.0 INTRODUCTION**

Tables 1 through 3 list the recorded radioactive liquid and gaseous effluents and solid waste shipments for the year, with data summarized on a quarterly basis for both liquids and gases. Table 4A summarizes the estimated radiological dose commitments from all radioactive liquid and gaseous effluents released during the year 2011 in response to the ALARA objectives of 10CFR50, Appendix I. Also included in Table 4A is the estimate of direct dose from fixed station sources along the limiting west site boundary line. Tables 5A through 6H report the cumulative joint frequency distributions of wind speed, wind direction, and atmospheric stability for the 12-month period, January to December 2011. Radioactive effluents reported in Tables 1 and 2 were used to determine the dose to the maximum exposed individual for 2011.

As required by ODCM Section 10.1, (Reference 1) dose commitments resulting from the release of radioactive materials in liquids and gases during the reporting period were estimated in accordance with the plant's "Off-Site Dose Calculation Manual" (ODCM). These dose estimates were made using a "Method II" analysis as described in the ODCM, and as reported in Tables 4A and 4B of this report. A "Method II" analysis incorporates the methodology of Regulatory Guide 1.109 (Reference 2) and actual measured meteorological data recorded concurrently with the quarterly reporting period.

As required by ODCM Section 10.1, this report shall also include an assessment of the radiation doses from radioactive effluents to member(s) of the public due to allowed recreational activities inside the site boundary during the year. During this reporting period, no recreational activity was permitted and, therefore, there is no associated dose assessment as stated in Section 3.6.

Assessment of radiation doses (including direct radiation) to the likely most exposed real member(s) of the public for the calendar year for the purposes of demonstrating conformance with 40CFR190, "Environmental Radiation Protection Standards for Nuclear Power Operations," are also required to be included in this report if the conditions indicated in ODCM 3/4.4, "Total Dose," have been exceeded during the year. Since the conditions indicated in the action statement under ODCM 3/4.4 were not entered into during the year, no additional radiation dose assessments are required. However, Table 4B does provide the combination of doses and dose commitments from plant effluents and direct radiation sources for the limiting member of the public off-site as a demonstration of compliance with the dose standards of 40CFR190.

All calculated dose estimates for members of the public at the site boundary or beyond for the 2011 annual reporting period are below the dose criteria of 10CFR Part 50, Appendix I, and 40CFR190.

Appendices B through H indicate the status of reportable items per the requirements of ODCM Section 10.1.

## 2.0 METEOROLOGICAL DATA

Meteorological data were collected in 2011 from the site's 300-foot meteorological tower located approximately 2,200 feet northwest of the reactor building, and about 1,400 feet from the plant stack. The 300-foot tower is approximately the same height as the primary plant stack (308 feet) and is designed to meet the requirements of Regulatory Guide 1.23 for meteorological monitoring. In mid-2009, the tower was moved to a location approximately 200 feet northwest of the original location.

$\chi/Q$  and  $D/Q$  values for elevated releases were derived for all receptor points from the site meteorological record for each quarter using a straight-line airflow model. All dispersion factors have been calculated employing appropriate source configuration considerations, as described in Regulatory Guide 1.111 (Reference 3). A source depletion model as described in "Meteorology and Atomic Energy - 1968" (Reference 4) was used to generate deposition factors, assuming a constant deposition velocity of 0.01 m/sec for all stack (elevated) releases. Changes in terrain elevations in the site environment were also factored into the meteorological models as appropriate.

In the event of a ground-level release,  $X/Q$  and  $D/Q$  values would be derived for the site boundary receptor points from the site meteorological record for each quarter using a straight-line airflow model. During this reporting period, there were no ground level releases and therefore no associated dose impact.

Table 4C lists the distances from the plant stack to the nearest site boundary, resident, and milk animal in each of the 16 principle compass directions as determined during the 2011 land use census. These locations were used in the calculation of atmospheric dispersion factors. The meteorological model was also executed for each calendar quarter to determine the location of the predicted maximum ground level air concentration from elevated releases from the plant's primary vent stack. These locations were included in the assessment of effluent doses along with identified points of interest from the annual land use census.

### 3.0 DOSE ASSESSMENT

#### 3.1 Doses From Liquid Effluents

ODCM 3/4.2.2 limits total body doses (1.5 mrem per quarter, and 3 mrem per year) and organ doses (5 mrem per quarter, and 10 mrem per year) from liquid effluents to a member of the public to those specified in 10CFR Part 50, Appendix I. By implementing the requirements of 10CFR Part 50, Appendix I, ODCM 3/4.2.2 assures that the release of radioactive material in liquid effluents will be kept "as low as is reasonably achievable."

There were no recorded routine liquid radioactive waste discharges during the report period. However, an abnormal release to the Connecticut River is postulated due to a leak in an underground pipe tunnel that runs between the Advanced Offgas (AOG) system building and other plant buildings which allowed accumulated piping system leakage to enter the subsurface groundwater adjacent to the plant structures. The existence of the leak was first recognized in January 2010, when a river shoreline Protected Area Boundary monitoring well sample was reported to have detectable tritium. The addition of other monitoring wells and subsequent analysis defined the extent of the affected groundwater plume moving toward the river and helped locate the source of the leak, which was stopped in February 2010.

Estimates of tritium-contaminated ground water released from the site are based on Protected Area Boundary monitoring well data collected throughout 2011, and hydrological modeling of ground water movement in the affected zone impacted by the pipe tunnel leak. Using a conservative estimate of groundwater flow through the affected area toward the river on a quarterly basis, an estimate of the total potential tritium released from the site during each quarter of 2011 was generated and reported in Table 2A.

For the projected ground water flow into the Connecticut River in 2011, the dose impact to the maximum exposed individual (MEI) assumed the following exposure pathways: (1) ingestion of fish (taken from Vernon Pond), (2) ingestion of vegetables and fresh leafy produce irrigated by water taken from the river below Vernon Dam, (3) ingestion of milk and meat from animals that were fed irrigated crops and drinking water taken from the river below Vernon Dam, and (4) potable water for a hypothetical individual drawing drinking water fed by the river below Vernon Dam. For Vernon Pond (river area adjacent to the plant property), the near shore mixing zone associated with the fish ingestion pathway is conservatively taken as 1% of the minimum recorded monthly river flow (4,323 cfs in July 2011) for dilution. All irrigation exposure pathways for the consumption of food products grown with irrigated water occur below Vernon Dam and assume the lowest 2011 quarterly average growing season river flow value (12,112 cfs in the third quarter) for environmental mixing. For the drinking water pathway, river flow mixing is assumed to occur below Vernon Dam and uses the lowest annual quarterly average river flow (11,067 cfs in the first quarter) as a conservative estimate of river dilution for all four quarters of the year. The dose models are taken from US NRC Regulatory Guide 1.109, Revision 1, and use environmental parameters for exposure pathways listed in Tables 4D and 4F.

The maximum estimated quarterly and annual whole body and organ doses to the limiting age group from liquid releases are reported in Table 4A. These estimated doses are well below the 10CFR Part 50, Appendix I dose criteria of ODCM 3/4.2.2. Table 4B provides an estimate of the total annual dose impact (including contributions from liquids) associated with the highest exposed member of the public for demonstration of compliance to the dose standard contained in 40CFR Part 190 for the uranium fuel cycle.

### 3.2 Doses From Noble Gases

ODCM 3/4.3.2 limits the gamma air dose (5 mrad per quarter, and 10 mrad per year) and beta air (10 mrad per quarter, and 20 mrad per year) dose from noble gases released in gaseous effluents from the site to areas at and beyond the site boundary to those specified in 10CFR Part 50, Appendix I. By implementing the requirements of 10CFR Part 50, Appendix I, ODCM 3/4.3.2 assures that the releases of radioactive noble gases in gaseous effluents will be kept "as low as is reasonably achievable."

There were no recorded noble gas releases during the report period, and therefore, no dose impact.

### 3.3 Doses From Iodine-131, Iodine-133, Tritium, Carbon-14, and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days

ODCM 3/4.3.3 limits the organ dose to a member of the public from iodine-131, iodine-133, tritium, carbon-14, and radionuclides in particulate form with half-lives greater than 8 days (hereafter called iodines and particulates) in gaseous effluents released from the site to areas at and beyond the site boundary to those specified in 10CFR Part 50, Appendix I (7.5 mrem per quarter, and 15 mrem per year). By implementing the requirements of 10CFR Part 50, Appendix I, ODCM 3/4.3.3 assures that the releases of iodines and particulates in gaseous effluents will be kept "as low as is reasonably achievable."

During 2011, a single frac tank was used on the Vermont Yankee site to temporarily store (outdoors) tritium-contaminated water extracted from onsite groundwater wells. The quantity of tritium released to the atmosphere through the evaporation of water from this frac tank was estimated, and the dose consequence to the maximally exposed individual was calculated.

Exposure pathways that could exist as a result of the release of iodines and particulates to the atmosphere include external irradiation from activity deposited onto the ground surface, inhalation, and ingestion of vegetables, meat and milk. Dose estimates were made at the site boundary and nearest resident in each of the sixteen principal compass directions, as well as all milk animal locations within five miles of the plant. The nearest resident and milk animals in each sector were identified by the most recent Annual Land Use Census as required by ODCM 3/4.5.2 (see Table 4C). Conservatively, a vegetable garden was assumed to exist at each milk animal and nearest resident location. Furthermore, the meat pathway was assumed to exist at each milk cow location since this data category is not part of the annual land use census. Doses were also calculated at the point of maximum ground level air concentration of radioactive materials in gaseous effluents and included the assumption that the inhalation, vegetable garden, and ground plane exposure pathways exist for an individual with a 100 percent occupancy factor.

It is assumed that milk and meat animals are free to graze on open pasture during the second and third quarters with no supplemental feeding. This assumption is conservative since most of the milk animals inventoried in the site vicinity are fed stored feed throughout the entire year with only limited grazing allowed during the growing season. It has also been assumed that only 50 percent of the iodine deposited from gaseous effluent is in elemental form ( $I_2$ ) and is available for uptake (see p. 6, Reference 2). During the non-growing season (first and fourth quarters), the milk animals are assumed to receive only stored feed. During the growing season (second and third quarters), all animal feed is assumed to be derived from fresh pasture. Usage factors for gaseous effluents are listed by age group and pathway in Table 4D. Table 4E provides other dose model parameter assumptions used in the dose assessments.

In June 2009, the NRC issued Revision 2 of Regulatory Guide 1.21 (Reference 7) which introduced the term “principal radionuclide” in a risk informed or dose context. A radionuclide can be considered a principal radionuclide if it contributes either (1) greater than 1 percent of the 10 CFR Part 50, Appendix I design objective dose for all radionuclides in the type of effluent being considered, or (2) greater than 1 percent of the activity of all radionuclides in the type of effluent being considered. In addition to natural production in the environment, Carbon-14 is also produced in nuclear reactors as a function of power output, but at amounts much less than those generated naturally or from past weapons testing. Since the time of the earlier publication of Regulatory Guide 1.21 (Revision 1) in 1974, commercial nuclear power plants have decreased total radioactive effluents (other than Carbon-14) through improved fuel performance and waste management practices to the point today that Carbon-14 could be considered a principal radionuclide under today’s definition, and therefore has been included in the assessment of dose to the public from gaseous effluent releases for 2011.

The primary exposure pathways associated with Carbon-14 include inhalation and ingestion of food products that have incorporated Carbon-14 (in the form of CO<sub>2</sub>) via photosynthesis. A full year’s consumption of food products are assumed to be grown from the highest impacted garden during the growing season (2nd and 3rd quarters). It is also assumed that the garden grows sufficient mass to support ingestion throughout the year (i.e., the annual dose to the individual is from consumption during all four quarters).

The resultant organ doses were determined after adding the contributions from all pathways at each location. Doses were calculated for the whole body, GI-tract, bone, liver, kidney, thyroid, lung and skin for adults, teenagers, children, and infants. The maximum estimated quarterly and annual organ doses to any age group due to iodines and particulates at any of the off-site receptor locations are reported in Table 4A. These estimated organ doses are well below the 10CFR Part 50, Appendix I dose criteria of ODCM 3/4.3.3. Table 4B provides an estimation of the total annual dose impact (including contributions from iodine and particulates) associated with the highest exposed member of the public for demonstration of compliance to the dose standard contained in 40CFR Part 190 for the uranium fuel cycle.

### 3.4 Whole Body Doses in Unrestricted Areas From Direct Radiation

The major dose in unrestricted areas occurs at the west site boundary, and mainly consists of direct and skyshine radiation from N-16 decay in the Turbine Building steam cycle during power operations. Because of the orientation of the Turbine Building on the site, and the shielding effects of the adjacent Reactor Building, only the seven westerly sectors (SSW to NNW) see any significant direct radiation.

A correlation method was derived, based directly on site boundary exposure rate and in-plant Main Steam Line Radiation Monitor measurements, that allows changes in the N-16 carryover in the main steam flow to be directly related to changes in the site boundary dose. This correlation is documented in section 6.11.1 (Equation 6-27a) of the ODCM. This method was used to calculate direct dose within the area of the maximum site boundary location from radiation sources in the steam cycle.

The other fixed sources of direct and scatter radiation to the site boundary are from the Independent Spent Fuel Storage Installation (ISFSI), the low level radioactive materials stored in the North Warehouse, the Low Level Waste Storage Pad Facility, and old turbine rotors and casings in the Turbine Storage Facility. The annual dose is based on dose rate measurements in these storage facilities and is determined to

occur at the same most restrictive site boundary dose location as that for N-16 shine from the Turbine Building.

The estimated direct radiation dose from all major sources combined for the most limiting site boundary location is listed in Table 4A. These site boundary doses assume a 100 percent occupancy factor, and take no credit for the shielding effect of any residential structure, and no credit for actual occupancy time is taken (i.e., occupancy is equal to 100%).

Table 4B lists the combination of direct radiation doses at the limiting site boundary location and the maximum offsite dose from gaseous and liquid effluents for the purpose of demonstrating compliance with the dose standards contained in 40 CFR Part 190. For 2011, this dose was below the 25 mrem total body and organ limit (75 mrem thyroid) of 40 CFR Part 190.

### 3.5 Doses From On-Site Disposal of Septic Waste, Cooling Tower Silt and Soil

Off-Site Dose Calculation Manual, Appendices B, F, and I require that all applications of septage, cooling tower silt, and sand/soil within the approved designated disposal areas be limited to ensure the dose to a maximally exposed individual during the period of Vermont Yankee site control be maintained at less than 1 mrem/year to the whole body and any organ. After the period associated with Vermont Yankee operational control, the dose to the inadvertent intruder is to be maintained at less than 5 mrem/year. The projected dose from on-site disposals of septic waste, cooling tower silt and sand/soil mixes is given in Appendix J of this report.

The dose limits applicable to the on-site spreading of materials were met for the single spreading of septic waste in 2011, based on the combined dose from this spreading and all past spreadings.

### 3.6 On-Site Recreational Activities

During 2011, no access for employees, their families and guests to the boat launching ramp located on-site just north of the intake structure was permitted. As such, no recreational activities were permitted on-site during the report period and, therefore, no associated dose impact to members of the public.

## REFERENCES

1. Off-site Dose Calculation Manual (ODCM), Revision 34, Entergy Nuclear Vermont Yankee, LLC , dated 07/08/2011.
2. Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Release of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR Part 50, Appendix I", U. S. Nuclear Regulatory Commission, Office of Standards Development, Revision 1, October 1977.
3. Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors", U.S. Nuclear Regulatory Commission, Office of Standards Development, March 1976.
4. Meteorology and Atomic Energy, 1968, Section 5-3.2.2, "Cloud Depletion", pg. 204. U. S. Atomic Energy Commission, July 1968.
5. Regulatory guide 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Revision 2, June 2009.

**TABLE IA**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Summation of All Releases**

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
<b>A. Fission and Activation Gases</b>				
1. Total release	Ci	ND	ND	
2. Average release rate for period	μCi/sec	ND	ND	
3. Percent of ODCM limit (1)	%	ND	ND	
<b>B. Iodines</b>				
1. Total Iodine	Ci	ND	4.80E-06	±1.80E+01
2. Average release rate for period	μCi/sec	ND	6.04E-07	
3. Percent of ODCM limit (2)	%	8.27E-04	1.02E-02	
<b>C. Particulates</b>				
1. Particulates with T-1/2>8 days	Ci	ND	ND	
2. Average release rate for period	μCi/sec	ND	ND	
3. Percent of ODCM limit (3)	%	(3)	(3)	
4. Gross alpha radioactivity	Ci	ND	ND	
<b>D. Tritium (4)</b>				
1. Total release	Ci	1.30E-01	5.70E-01	±1.80E+01
2. Average release rate for period	μCi/sec	1.63E-02	7.17E-02	
3. Percent of ODCM limit (3)	%	(3)	(3)	
<b>E. Carbon-14</b>				
1. Total release	Ci	1.92E+00	1.93E+00	(6)
2. Average release rate for period	μCi/sec	2.47E-01	2.45E-01	
3. Percent of ODCM limit (5)	%	7.46E+00	7.50E+00	

ND = Not Detected

- (1) ODCM Control 3.3.2. for the most limiting of beta air or gamma air dose. Percentage of ODCM limit calculated using Method I dose results.
- (2) ODCM Control 3.3.3. for dose from I-131, I-133, Tritium, and radionuclides in particulate form. Percentage of ODCM limit calculated using Method I dose results.
- (3) Per ODCM Control 3.3.3, dose contribution from Tritium and particulates are included with Iodine above in Part B.
- (4) Tritium released through evaporation from the onsite frac tank is included in these totals.
- (5) ODCM Control 3.3.3. for dose from I-131, I-133, Tritium, and radionuclides in particulate form. Percentage of ODCM limit calculated using Method II dose results, for Carbon-14 only.
- (6) The total Carbon-14 release is calculated, based on EPRI Technical Report 1021106, "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents." The "Estimated Total Error" is therefore not applicable.

**TABLE 1A**  
(Continued)

**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report for 2011**  
**Gaseous Effluents - Summation of All Releases**

	Unit	Quarter 3	Quarter 4	Est. Total Error, %
<b>A. Fission and Activation Gases</b>				
1. Total release	Ci	ND	ND	
2. Average release rate for period	μCi/sec	ND	ND	
3. Percent of ODCM limit (1)	%	ND	ND	
<b>B. Iodines</b>				
1. Total Iodine	Ci	ND	ND	
2. Average release rate for period	μCi/sec	ND	ND	
3. Percent of ODCM limit (2)	%	4.82E-03	1.41E-03	
<b>C. Particulates</b>				
1. Particulates with T-1/2>8 days	Ci	ND	1.04E-05	±1.80E+01
2. Average release rate for period	μCi/sec	ND	1.31E-06	
3. Percent of ODCM limit (3)	%	(3)	(3)	
4. Gross alpha radioactivity	Ci	ND	ND	
<b>D. Tritium (4)</b>				
1. Total release	Ci	7.55E-01	2.19E-01	±1.80E+01
2. Average release rate for period	μCi/sec	9.50E-02	2.75E-02	
3. Percent of ODCM limit (3)	%	(3)	(3)	
<b>E. Carbon-14</b>				
1. Total release	Ci	1.87E+00	1.37E+00	(6)
2. Average release rate for period	μCi/sec	2.35E-01	1.72E-01	
3. Percent of ODCM limit (5)	%	7.27E+00	5.32E+00	

ND = Not Detected

- (1) ODCM Control 3.3.2. for the most limiting of beta air or gamma air dose. Percentage of ODCM limit calculated using Method I dose results.
- (2) ODCM Control 3.3.3. for dose from 1-131, 1-133, Tritium, and radionuclides in particulate form. Percentage of ODCM limit calculated using Method I dose results.
- (3) Per ODCM Control 3.3.3, dose contribution from Tritium and particulates are included with Iodine above in Part B.
- (4) Tritium released through evaporation from the onsite frac tank is included in these totals.
- (5) ODCM Control 3.3.3. for dose from 1-131, 1-133, Tritium, and radionuclides in particulate form. Percentage of ODCM limit calculated using Method II dose results, for Carbon-14 only.
- (6) The total Carbon-14 release is calculated, based on EPRI Technical Report 1021106, "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents." The "Estimated Total Error" is therefore not applicable.

**TABLE IB**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Elevated Releases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter		Quarter	
		1	2	1	2
<b>1. Fission Gases</b>					
Argon-41	Ci	ND	ND		
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-133m	Ci	ND	ND		
Xenon-135	Ci	ND	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Unidentified	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>ND</b>	<b>(1)</b>	<b>(1)</b>
<b>2. Iodines</b>					
Iodine-131	Ci	ND	4.80E-06		
Iodine-133	Ci	ND	ND		
Iodine-135	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>4.80E-06</b>	<b>(1)</b>	<b>(1)</b>
<b>3. Particulates</b>					
Strontium-89	Ci	ND	ND		
Strontium-90	Ci	ND	ND		
Cesium-134	Ci	ND	ND		
Cesium-137	Ci	ND	ND		
Barium-Lanthanum-140	Ci	ND	ND		
Manganese-54	Ci	ND	ND		
Chromium-51	Ci	ND	ND		
Cobalt-57	Ci	ND	ND		
Cobalt-60	Ci	ND	ND		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>ND</b>	<b>(1)</b>	<b>(1)</b>

ND Not Detected at the plant stack

(1) There were no batch mode gaseous releases for this reporting period.

**TABLE IB**  
(Continued)

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Elevated Releases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter		Quarter	
		3	4	3	4
<b>1. Fission Gases</b>					
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-133m	Ci	ND	ND		
Xenon-135	Ci	ND	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Unidentified	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>ND</b>	(1)	(1)
<b>2. Iodines</b>					
Iodine-131	Ci	ND	ND		
Iodine-133	Ci	ND	ND		
Iodine-135	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>ND</b>	(1)	(1)
<b>3. Particulates</b>					
Strontium-89	Ci	ND	ND		
Strontium-90	Ci	ND	ND		
Cesium-134	Ci	ND	ND		
Cesium-137	Ci	ND	ND		
Barium-Lanthanum-140	Ci	ND	ND		
Manganese-54	Ci	ND	ND		
Chromium-51	Ci	ND	ND		
Cobalt-58	Ci	ND	ND		
Cobalt-60	Ci	ND	1.04E-05		
Cerium-141	Ci	ND	ND		
Cerium-144	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>1.04E-05</b>	(1)	(1)

ND Not Detected at the Plant Stack

(1) There were no batch mode gaseous releases for this reporting period.

**TABLE 1C**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Ground Level Releases <sup>(2)</sup>**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter		Quarter	
		1	2	1	2
<b>1. Fission Gases</b>					
Krypton-85	Ci				
Krypton-85m	Ci				
Krypton-87	Ci				
Krypton-88	Ci				
Xenon-133	Ci				
Xenon-135	Ci				
Xenon-135m	Ci				
Xenon-138	Ci				
Unidentified	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)
<b>2. Iodines</b>					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-135	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)
<b>3. Particulates</b>					
Strontium-89	Ci				
Strontium-90	Ci				
Cesium-134	Ci				
Cesium-137	Ci				
Barium-Lanthanum-140	Ci				
Manganese-54	Ci				
Chromium-51	Ci				
Cobalt-58	Ci				
Cobalt-60	Ci				
Cerium-141	Ci				
Zinc-65	Ci				
Iron-55	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)

(1) There were no ground level gaseous releases for this reporting period.  
(2) No radioactively contaminated used oil was burned during 2011.

**TABLE IC**  
(Continued)

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Ground Level Releases<sup>(2)</sup>**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter		Quarter	
		3	4	3	4
<b>1. Fission Gases</b>					
Krypton-85	Ci				
Krypton-85m	Ci				
Krypton-87	Ci				
Krypton-88	Ci				
Xenon-133	Ci				
Xenon-135	Ci				
Xenon-135m	Ci				
Xenon-138	Ci				
Unidentified	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)
<b>2. Iodines</b>					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-135	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)
<b>3. Particulates</b>					
Strontium-89	Ci				
Strontium-90	Ci				
Cesium-134	Ci				
Cesium-137	Ci				
Barium-Lanthanum-140	Ci				
Manganese-54	Ci				
Chromium-51	Ci				
Cobalt-58	Ci				
Cobalt-60	Ci				
Cerium-141	Ci				
Zinc-65	Ci				
Iron-55	Ci				
<b>Total for Period</b>	<b>Ci</b>	(1)	(1)	(1)	(1)

- (1) There were no ground level gaseous releases for this reporting period.  
(2) No radioactively contaminated used oil was burned during 2011.

TABLE 1D

Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Gaseous Effluents - Nonroutine Releases

There were no non-routine or accidental gaseous releases during this reporting period.

**TABLE 2A**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Liquid Effluents - Summation of All Releases**

	Units	Quarter 1	Quarter 2	Est. Total Error, %
<b>A. Fission and Activation Products</b>				
1. Total Release (not including tritium, gases, alpha)	Ci	ND	ND	
2. Average Diluted Concentration During Period	μCi/ml	ND	ND	
3. Percent of Applicable Limit (1)	%	ND	ND	
<b>B. Tritium</b>				
1. Total Release	Ci	2.17E+00	5.63E-01	±2.00E+01
2. Average Diluted Concentration During Period	μCi/ml	1.73E-04	9.04E-05	
3. Percent of Applicable Limit (1)	%	1.01E-02	2.61E-03	
<b>C. Dissolved and Entrained Gases</b>				
1. Total Release	Ci	ND	ND	
2. Average Diluted Concentration During Period	μCi/ml	ND	ND	
3. Percent of Applicable Limit	%	ND	ND	
<b>D. Gross Alpha Radioactivity</b>				
1. Total Release	Ci	ND	ND	
<b>E. Volume of Waste Release (prior to dilution)</b>				
	Liters	(2)	(2)	
<b>F. Volume of Dilution Water Used During Period</b>				
	Liters	3.89E+06	3.89E+06	(3)

ND Not detected in liquid effluents.

- (1) The percent of limit is based on the ODCM Control 3.2.2 limiting dose (1.5 mrem/quarter) from liquid effluents and is related to the abnormal leakage of tritiated plant water into the underground environment.  
The percent of the concentration limits specified in Appendix B to 10CFR20.1001 – 20.2402, Table 2, Column 2 (ODCM Control 3.2.1) were estimated to be 17.3%, 9.0%, 1.4%, and 0.8% for the first, second, third, and fourth quarters, respectively.
- (2) Leakage of contaminated plant water to subsurface areas was stopped in February 2010. The release of contaminated ground water to the Connecticut River is based on site boundary monitoring well data collected during 2011.
- (3) Dilution due to groundwater flow through the affected subsurface plume area toward the Connecticut River was estimated to be 7.83 gpm (or 3.89E+06 liters per quarter) during 2011. An Estimated Total Error is not applicable.

**TABLE 2A**  
(Continued)

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Liquid Effluents - Summation of All Releases**

	Units	Quarter 3	Quarter 4	Est. Total Error, %
<b>A. Fission and Activation Products</b>				
1. Total Release (not including tritium, gases, alpha)	Ci	ND	ND	
2. Average Diluted Concentration During Period	μCi/ml	ND	ND	
3. Percent of Applicable Limit (1)	%	ND	ND	
<b>B. Tritium</b>				
1. Total Release	Ci	5.48E-02	3.44E-02	±2.00E+01
2. Average Diluted Concentration During Period	μCi/ml	1.43E-05	8.45E-06	
3. Percent of Applicable Limit (1)	%	2.54E-04	1.59E-04	
<b>C. Dissolved and Entrained Gases</b>				
1. Total Release	Ci	ND	ND	
2. Average Diluted Concentration During Period	μCi/ml	ND	ND	
3. Percent of Applicable Limit	%	ND	ND	
<b>D. Gross Alpha Radioactivity</b>				
1. Total Release	Ci	ND	ND	
<b>E. Volume of Waste Release (prior to dilution)</b>				
	Liters	(2)	(2)	
<b>F. Volume of Dilution Water Used During Period</b>				
	Liters	3.89E+06	3.89E+06	(3)

ND Not detected in liquid effluents.

(1) The percent of limit is based on the ODCM Control 3.2.2 limiting dose (1.5 mrem/quarter) from liquid effluents and is related to the abnormal leakage of tritiated plant water into the underground environment.

The percent of the concentration limits specified in Appendix B to 10CFR20.1001 – 20.2402, Table 2, Column 2 (ODCM Control 3. 2.1) were estimated to be 17.3%, 9.0%, 1.4%, and 0.8% for the first, second, third, and fourth quarters, respectively.

(2) Leakage of contaminated plant water to subsurface areas was stopped in February 2010. The release of contaminated ground water to the Connecticut River is based on site boundary monitoring well data collected during 2011.

(3) Dilution due to groundwater flow through the affected subsurface plume area toward the Connecticut River was estimated to be 7.83 gpm (or 3.89E+06 liters per quarter) during 2011. An Estimated Total Error is not applicable.

**TABLE 2B**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2011  
Liquid Effluents - Routine Releases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Strontium-89	Ci	-	-	-	-
Strontium-90	Ci	-	-	-	-
Cesium-134	Ci	-	-	-	-
Cesium-137	Ci	-	-	-	-
Iodine-131	Ci	-	-	-	-
Cobalt-58	Ci	-	-	-	-
Cobalt-60	Ci	-	-	-	-
Iron-59	Ci	-	-	-	-
Zinc-65	Ci	-	-	-	-
Manganese-54	Ci	-	-	-	-
Zirconium-Niobium-95	Ci	-	-	-	-
Molybdenum-99	Ci	-	-	-	-
Technetium-99	Ci	-	-	-	-
Barium-Lanthanum-140	Ci	-	-	-	-
Cerium-141					
Other (specify)	Ci	-	-	-	-
	Ci	-	-	-	-
	Ci	-	-	-	-
Unidentified	Ci	-	-	-	-
Total for Period (above)	Ci	-	-	-	-
Xe-133	Ci	-	-	-	-
Xe-135	Ci	-	-	-	-

---

ND Not detected in liquid effluents.  
- Dash indicates no release of this type.

**TABLE 2B**  
(Continued)

**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report for 2011**  
**Liquid Effluents<sup>(a)</sup> - Routine Releases**

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Strontium-89	Ci	-	-	-	-
Strontium-90	Ci	-	-	-	-
Cesium-134	Ci	-	-	-	-
Cesium-137	Ci	-	-	-	-
Iodine-131	Ci	-	-	-	-
Cobalt-58	Ci	-	-	-	-
Cobalt-60	Ci	-	-	-	-
Iron-59	Ci	-	-	-	-
Zinc-65	Ci	-	-	-	-
Manganese-54	Ci	-	-	-	-
Zirconium-Niobium-95	Ci	-	-	-	-
Molybdenum-99	Ci	-	-	-	-
Technetium-99	Ci	-	-	-	-
Barium-Lanthanum-140	Ci	-	-	-	-
Cerium-141					
Other (specify)	Ci	-	-	-	-
	Ci	-	-	-	-
	Ci	-	-	-	-
Unidentified	Ci	-	-	-	-
Total for Period (above)	Ci	-	-	-	-
Xe-133	Ci	-	-	-	-
Xe-135	Ci	-	-	-	-

---

ND Not detected in liquid effluents.  
- Dash indicates no release of this type.

**Table 3**  
**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report**  
**First and Second Quarters for 2011**  
**Solid Waste and Irradiated Fuel Shipments**

**A. Solid Waste Shipped Off-Site for Burial or Disposal (not irradiated fuel)**

**1. Type of Waste**

Shipped from VY for Burial	Unit	1st & 2nd Quarters	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	None	N/A
	Cl	None	N/A
b. Dry Compressible waste, equipment, etc.	m3	None	N/A
	Cl	None	N/A
c. Irradiated components, control rods, etc.	m3	None	N/A
	Cl	None	N/A

Shipped from Processor(s) for Burial	Unit	1st & 2nd Quarters	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	1.06E+01	±25%
	Cl	3.73E+01	±25%
b. Dry Compressible waste, equipment, etc.	m3	6.64E+01	±25%
	Cl	1.55E+00	±25%
c. Irradiated components, control rods, etc.	m3	0.00E+00	±25%
	Cl	0.00E+00	±25%

**2. Estimate of Major Nuclide Composition (By Type of Waste)**

a. Spent resins filter sludges		b. Dry Compressible waste, equip, etc.		c. Irradiated components, control rods, etc.	
Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)
Carbon-14	1.18%	Chromium 51	6.62%	None	N/A
Manganese-54	4.64%	Manganese-54	2.16%		
Iron-55	26.42%	Iron-55	46.35%		
Cobalt 58	0.51%	Iron 59	0.57%		
Cobalt-60	28.21%	Cobalt 58	0.67%		
Nickel-63	4.53%	Cobalt-60	29.18%		
Zinc-65	24.23%	Nickel-63	0.62%		
Strontium-89	0.43%	Zinc-65	13.37%		
Cesium 137	13.56%	Zirconium 95	0.12%		
Tritium	100%	Niobium 95	0.24%		
		Silver 110m	0.10%		
		Antimony 124	0.10%		
		Cesium 137	28.35%		

(1) Includes only those nuclides that are greater than 0.1% of the total activity

**3. Disposition of Solid Waste Shipments (1st & 2nd Quarters)**

No. of Shipments	From VY	From Processor	Mode	To Processor	To Burial
11	X		Truck	ES-GR / ES BCO, TN	
9		X	Truck		ES Clve

**B. Irradiated Fuel Shipments (Disposition): None**

**C. Additional Data (1st & 2nd Quarters)**

Supplemental Information	VY to Processor	VY to Burial	Processors to Burial
Class of Solid Waste Shipped	AU	none	AU
Type of Containers Used	GDC, Type A	none	GDC, Type A
Solidification Agent or Absorbent Used	none	none	none

GR = Gallaher Road  
BCO = Bear Creek Operations  
E/S = Energy Solutions

Completed By: *Michael Gibson*

Reviewed By: *A. R. Derting*

*L.R. DERTING*

5/3/12

**Table 3**  
**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report**  
**Third and Fourth Quarters for 2011**  
**Solid Waste and Irradiated Fuel Shipments**

**A. Solid Waste Shipped Off-Site for Burial or Disposal (not irradiated fuel)**

**1. Type of Waste**

Shipped from VY for Burial	Unit	3rd & 4th Quarters	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	None	N/A
	Cl	None	N/A
b. Dry Compressible waste, equipment, etc.	m3	None	N/A
	Cl	None	N/A
c. Irradiated components, control rods, etc.	m3	None	N/A
	Cl	None	N/A

Shipped from Processor(s) for Burial	Unit	3rd & 4th Quarters	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	4.55E+01	±25%
	Cl	4.11E+01	±25%
b. Dry Compressible waste, equipment, etc.	m3	2.19E+01	±25%
	Cl	4.17E+00	±25%
c. Irradiated components, control rods, etc.	m3	0.00E+00	±25%
	Cl	0.00E+00	±25%

**2. Estimate of Major Nuclide Composition (By Type of Waste)**

a. Spent resins filter sludges		b. Dry Compressible waste, equip, etc.		c. Irradiated components, control rods, etc.	
Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)
Chromium 51	2.47%	Chromium 51	7.63%	None	N/A
Manganese-54	4.56%	Manganese-54	2.18%		
Iron-55	22.33%	Iron-55	46.24%		
Cobalt 58	0.79%	Iron 59	0.62%		
Cobalt-60	22.62%	Cobalt 58	0.71%		
Nickel-63	5.49%	Cobalt-60	26.02%		
Zinc-65	27.29%	Nickel-63	0.61%		
Strontium-90	0.18%	Zinc-65	15.95%		
Cesium 137	16.06%	Zirconium 95	0.13%		
		Niobium 95	0.26%		
		Silver 110m	0.10%		
		Antimony 124	0.10%		

(1) includes only those nuclides that are greater than 0.1% of the total activity

**3. Disposition of Solid Waste Shipments (1st & 2nd Quarters)**

No. of Shipments	From VY	From Processor	Mode	To Processor	To Burial
7	X		Truck	ES-GR / ES BCO, TN	
11		X	Truck		ES Clive

**B. Irradiated Fuel Shipments (Disposition): None**

**C. Additional Data (1st & 2nd Quarters)**

Supplemental Information	VY to Processor	VY to Burial	Processors to Burial
Class of Solid Waste Shipped	AU	none	AU
Type of Containers Used	GDC, Type A	none	GDC, Type A
Solidification Agent or Absorbent Used	none	none	none

GR = Gallaher Road  
 BCO = Bear Creek Operations  
 E/S = Energy Solutions

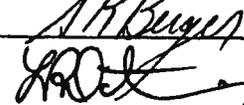
Completed By:   
 Reviewed By:   
 L.R.DERTING 5/3/12

TABLE 4A

Entergy Nuclear Vermont Yankee  
Maximum\* Off-Site Doses/Dose Commitments to Members of the Public  
from Liquid and Gaseous Effluents for 2011  
(10CFR50, Appendix I)

Source	Dose (mrem) <sup>(a)</sup>				
	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter	Year <sup>(b)</sup>
<b>Liquid Effluents</b>					
Total Body Dose	1.51E-04	3.92E-05	3.81E-06	2.39E-06	1.96E-04
Footnotes	(c)	(c)	(c)	(c)	(c)
Organ Dose	1.51E-04	3.92E-05	3.81E-06	2.39E-06	1.96E-04
Footnotes	(c)	(c)	(c)	(c)	(c)
<b>Airborne Effluents</b>					
Iodines, H-3, C-14, and Particulates	2.50E-01	2.50E-01	2.51E-01	2.50E-01	1.00E+00
Footnotes	(f)	(f)	(f)	(f)	
<b>Noble Gases</b>					
Beta Air (mrad)	--	--	--	--	--
Footnotes	(d)	(d)	(d)	(d)	(d)
Gamma Air (mrad)	--	--	--	--	--
Footnotes	(d)	(d)	(d)	(d)	(d)
<b>Direct Radiation</b>					
	4.29	4.37	4.73	3.53	16.92 (e)

- \* "Maximum" means the largest fraction of the corresponding 10CFR50, Appendix I dose design objective.
- (a) The numbered footnotes indicate the age group, organ, and location of the dose receptor, where appropriate.
- (b) The yearly dose is the sum of the doses for each quarter, or a full annual assessment.
- (c) The critical age group/organ for the Maximum Exposed Individual (MEI) is the Adult/Total Body.
- (d) There were no noble gas releases in this quarter.
- (e) Maximum direct dose point located on the old west site boundary, approximately 208 meters from the Turbine Building (per ODCM, Rev. 34, Sect. 6.11.1).
- (f) The critical age group/organ for the MEI is the Child/Bone, at a location WNW, 2400 meters from the stack.

TABLE 4B

Entergy Nuclear Vermont Yankee  
 Maximum Annual Dose Commitments from Direct External Radiation,  
 Plus Liquid and Gaseous Effluents for 2011<sup>(\*)</sup>  
 (40CFR190)

Pathway	Total Body (mrem)	Maximum Organ (mrem)	Thyroid (mrem)
Direct External (a) (b)	16.92	16.92	16.92
Liquids (c)	1.96E-04	1.96E-04	1.96E-04
Gases (c)	2.00E-01	1.00E+00	2.00E-01
Annual Total (d)	17.12	17.92	17.12

- (\*) The location of the projected maximum individual doses from combined direct radiation plus liquid and gaseous effluents correspond to residences at the southwest boundary relative to the Turbine Hall.
- (a) No occupancy time fraction (assumed 100%) or residential shielding credit is assumed which would reduce real doses below the calculated values. Expected direct external radiation doses would be reduced by about 54% with a realistic residential shielding credit and occupancy time (0.7 shielding factor from Regulatory Guide 1.109 and annual occupancy time 6760 hours).
- (b) The direct dose reported here was calculated using the current ODCM methodology and represents the dose to the former nearest residence, which was located in the S sector at 385 meters from the stack prior to the vacancy of this residence in 2008 and the purchase of land by Vermont Yankee.
- (c) Maximum dose to any organ over all age groups for each release.
- (d) Annual dose limits contained in the EPA Radiation Protection Standards (40CFR190) equal 25 mrem to the total body and any organ, except 75 mrem to the thyroid of a real member of the public.

TABLE 4C

Receptor Locations  
Entergy Nuclear Vermont Yankee

Sector	Site Boundary <sup>(1)</sup> (Meters)	Nearest Resident <sup>(2)</sup> (Meters)	Nearest Milk Animal <sup>(2)</sup> Within 10 km (Meters)
N	400	1400	--
NNE	350	1384	5520 (cows)
NE	350	1255	--
ENE	400	966	--
E	500	933	--
ESE	700	1915	--
SE	750	1963	3600 (cows)
SSE	850	2044	--
S	385	644	2220 (cows)
SSW	300	451	--
SW	250	418	8200 (cows)
WSW	250	451	9730 (cows)
W	300	628	820 (cows)
WNW	400	1062	--
NW	550	2253	--
NNW	550	1738	--

(1) Vermont Yankee UFSAR Figure 2.2-5.

(2) The location(s) given are based on information from the Vermont Yankee 2011 Land Use Census and are relative to the plant stack. Gardens are assumed to be present at all resident locations.

TABLE 4D

Usage Factors for Environmental Pathways  
Entergy Nuclear Vermont Yankee

Age Group	Fish (kg/yr)	Potable Water (l/yr)	Veg. (kg/yr)	Leafy Veg. (kg/yr)	Milk (l/yr)	Meat (kg/yr)	Inhalation (m <sup>3</sup> /yr)
Adult	21	730	520	64	310	110	8,000
Teen	16	510	630	42	400	65	8,000
Child	6.9	510	520	26	330	41	3,700
Infant	0	330	0	0	330	0	1,400

\* Regulatory Guide 1.109, Table E-5 (Reference 2).

TABLE 4E

Environmental Parameters for Gaseous Effluents \*  
 Entergy Nuclear Vermont Yankee

Variable	Vegetables		Cow Milk		Goat Milk		Meat	
	Stored	Leafy	Pasture	Stored	Pasture	Stored	Pasture	Stored
YV Agricultural Productivity (kg/m <sup>2</sup> )	2	2	0.70	2	0.70	2	0.70	2
P Soil Surface Density (kg/m <sup>2</sup> )	240	240	240	240	240	240	240	240
T Transport Time to User (hrs)			48	48	48	48	480	480
TB Soil Exposure Time <sup>(a)</sup> (hrs)	131,400	131,400	131,400	131,400	131,400	131,400	131,400	131,400
TE Crop Exposure Time to Plume (hrs)	1,440	1,440	720	1,440	720	1,440	720	1,440
TH Holdup After Harvest (hrs)	1,440	24	0	2,160	0	2,160	0	2,160
QF Animals Daily Feed (kg/day)			50	50	6	6	50	50
FP Fraction of Year on Pasture			(b)		(b)		(b)	
FS Fraction Pasture Feed When on Pasture <sup>(c)</sup>			1	1	1	1	1	1

Note: Footnotes on following page.

TABLE 4E (Continued)  
 Environmental Parameters for Gaseous Effluents  
 Entergy Nuclear Vermont Yankee

Variable	Vegetables		Cow Milk		Goat Milk		Meat	
	Stored	Leafy	Pasture	Stored	Pasture	Stored	Pasture	Stored
FG Fraction of Stored Vegetables Grown in Garden	0.76							
FL Fraction of Leafy Vegetables Grown in Garden		1.0						
FI Fraction Elemental Iodine = 0.5								
H Absolute Humidity = 5.6 <sup>(d)</sup>								

\* From VY ODCM, Table 6.9.1 (Reference 1).

- (a) For Method II dose/dose rate analyses of identified radioactivity releases of less than one year, the soil exposure time for that release may be set at 8,760 hours (one year) for all pathways.
- (b) For Method II dose/dose rate analyses performed for releases occurring during the first or fourth calendar quarters, the fraction of time animals are assumed to be on pasture is zero (non-growing season). For the second and third calendar quarters, the fraction of time on pasture (FP) will be set at 1.0. FP may also be adjusted for specific farm locations if this information is so identified and reported as part of the land use census.
- (c) For Method II analyses, the fraction of pasture feed while on pasture may be set to less than 1.0 for specific farm locations if this information is so identified and reported as part of the land use census.
- (d) For all Method II analyses, an absolute humidity value equal to 5.6 (gm/m<sup>3</sup>) shall be used to reflect conditions in the Northeast (Reference: Health Physics Journal, Volume 39 (August), 1980; Pages 318-320, Pergamon Press).

TABLE 4F

Environmental Parameters for Liquid Releases (Tritium) Via Groundwater  
Entergy Nuclear Vermont Yankee

Variable Name (Units)	Potable Water	Aquatic Food	Stored Veg.	Leafy Veg.	Meat	Cow Milk
Mixing Ratio	1.58E-06	4.04E-04	1.44E-06	1.44E-06	1.44E-06	1.44E-06
Transit Time (hrs)*	12	24	0	0	0	0
Water Uptake** (animal) (L/day)					50.0	60.0
Feed Uptake*** (animal) (kg/day)					50.0	50.0

\* Values are from Regulatory Guide 1.109, Table E-15 (Reference 2)

\*\* Values are from Regulatory Guide 1.109, Table E-3 (Reference 2)

TABLE 5A

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = .52

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ESE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
(1)	4.55	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.55
(2)	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
C-3	1	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	7
(1)	2.27	4.55	4.55	.00	4.55	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	15.91
(2)	.01	.02	.02	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08
4-7	0	0	1	0	3	4	1	3	0	0	0	0	0	0	1	4	0	17
(1)	.00	.00	2.27	.00	6.82	9.09	2.27	6.82	.00	.00	.00	.00	.00	.00	2.27	9.09	.00	38.64
(2)	.00	.00	.01	.00	.04	.05	.01	.04	.00	.00	.00	.00	.00	.00	.01	.05	.00	.20
8-12	0	0	0	0	1	4	0	8	3	0	0	0	0	0	0	1	0	17
(1)	.00	.00	.00	.00	2.27	9.09	.00	18.18	6.82	.00	.00	.00	.00	.00	.00	2.27	.00	38.64
(2)	.00	.00	.00	.00	.01	.05	.00	.10	.04	.00	.00	.00	.00	.00	.00	.01	.00	.20
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.27	.00	2.27
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	3	2	3	0	4	10	1	11	3	0	0	0	0	0	1	6	0	44
(1)	6.82	4.55	6.82	.00	9.09	22.73	2.27	25.00	6.82	.00	.00	.00	.00	.00	2.27	13.64	.00	100.00
(2)	.04	.02	.04	.00	.05	.12	.01	.13	.04	.00	.00	.00	.00	.00	.01	.07	.00	.52

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5B

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = 1.09

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.10	.00	.00	.00	.00	1.10
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.01
4-7	8	2	0	0	7	13	12	7	1	0	0	0	0	0	0	0	0	55
(1)	8.79	2.20	.00	.00	7.69	14.29	13.19	7.69	1.10	.00	.00	.00	.00	.00	.00	.00	.00	60.44
(2)	.10	.02	.00	.00	.08	.16	.14	.08	.01	.00	.00	.00	.00	.00	.00	.00	.00	.66
8-12	0	2	0	0	0	0	3	7	3	0	0	0	0	0	0	0	0	32
(1)	.00	2.20	.00	.00	.00	.00	3.30	7.69	3.30	.00	.00	.00	.00	.00	.00	.00	.00	35.16
(2)	.00	.02	.00	.00	.00	.00	.04	.08	.04	.00	.00	.00	.00	.00	.00	.00	.00	.38
13-18	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.10	.00	2.20	.00	.00	3.30
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.02	.00	.00	.04
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	8	4	0	0	7	13	15	14	4	0	0	0	2	0	2	22	0	91
(1)	8.79	4.40	.00	.00	7.69	14.29	16.48	15.38	4.40	.00	.00	.00	2.20	.00	2.20	24.18	.00	100.00
(2)	.10	.05	.00	.00	.08	.16	.18	.17	.05	.00	.00	.00	.02	.00	.02	.26	.00	1.09

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5C

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 2.72

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	MNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	2	0	1	1	3	3	0	0	1	0	0	0	0	1	0	2	0	15
(1)	.88	.00	.44	.44	1.32	1.32	.00	.00	.44	.00	.00	.00	.00	.44	.00	.88	.00	6.58
(2)	.02	.00	.01	.01	.04	.04	.00	.00	.01	.00	.00	.00	.00	.01	.00	.02	.00	.18
4-7	19	6	4	6	15	14	7	20	9	3	3	0	0	1	3	17	0	127
(1)	8.33	2.63	1.75	2.63	6.58	6.14	3.07	8.77	3.95	1.32	1.32	.00	.00	.44	1.32	7.46	.00	55.70
(2)	.23	.07	.05	.07	.18	.17	.08	.24	.11	.04	.04	.00	.00	.01	.04	.20	.00	1.51
8-12	9	1	1	0	0	1	3	11	9	4	4	0	5	0	2	20	0	70
(1)	3.95	.44	.44	.00	.00	.44	1.32	4.82	3.95	1.75	1.75	.00	2.19	.00	.88	8.77	.00	30.70
(2)	.11	.01	.01	.00	.00	.01	.04	.13	.11	.05	.05	.00	.06	.00	.02	.24	.00	.84
13-18	0	0	0	0	0	0	0	2	1	0	0	0	0	2	10	1	0	16
(1)	.00	.00	.00	.00	.00	.00	.00	.88	.44	.00	.00	.00	.00	.88	4.39	.44	.00	7.02
(2)	.00	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00	.00	.00	.02	.12	.01	.00	.19
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	30	7	6	7	16	18	13	33	20	7	7	0	5	4	15	40	0	228
(1)	13.16	3.07	2.63	3.07	7.02	7.89	5.70	14.47	8.77	3.07	3.07	.00	2.19	1.75	6.58	17.54	.00	100.00
(2)	.36	.08	.07	.08	.19	.21	.16	.39	.24	.08	.08	.00	.06	.05	.18	.48	.00	2.72

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

# TABLE 5D

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA      STABILITY CLASS D      CLASS FREQUENCY (PERCENT) = 42.81

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.03	.00	.06
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.02
C-3	94	57	56	52	74	74	62	53	45	29	35	23	25	33	62	119	0	893
(1)	2.62	1.59	1.56	1.45	2.06	2.06	1.73	1.48	1.25	.81	.98	.64	.70	.92	1.73	3.32	.00	24.88
(2)	1.12	.68	.67	.62	.88	.88	.74	.63	.54	.35	.42	.27	.30	.39	.74	1.42	.00	10.65
4-7	133	40	20	17	54	98	159	277	116	21	16	25	58	52	177	334	0	1597
(1)	3.71	1.11	.56	.47	1.50	2.73	4.43	7.72	3.23	.59	.45	.70	1.62	1.45	4.93	9.31	.00	44.50
(2)	1.59	.48	.24	.20	.64	1.17	1.90	3.30	1.38	.25	.19	.30	.69	.62	2.11	3.98	.00	19.05
8-12	63	6	3	1	0	24	14	101	93	15	11	15	98	115	129	204	0	892
(1)	1.76	.17	.08	.03	.00	.67	.39	2.81	2.59	.42	.31	.42	2.73	3.20	3.59	5.68	.00	24.85
(2)	.75	.07	.04	.01	.00	.29	.17	1.20	1.11	.18	.13	.18	1.17	1.37	1.54	2.43	.00	10.64
13-18	3	0	0	0	1	0	0	6	12	6	0	0	11	64	53	39	0	195
(1)	.08	.00	.00	.00	.03	.00	.00	.17	.33	.17	.00	.00	.31	1.78	1.48	1.09	.00	5.43
(2)	.04	.00	.00	.00	.01	.00	.00	.07	.14	.07	.00	.00	.13	.76	.63	.47	.00	2.33
19-24	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	4	0	10
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.06	.08	.11	.00	.28
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.04	.05	.00	.12
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	293	103	79	70	129	196	235	437	266	71	62	63	193	266	425	701	0	3589
(1)	8.16	2.87	2.20	1.95	3.59	5.46	6.55	12.18	7.41	1.98	1.73	1.76	5.38	7.41	11.84	19.53	.00	100.00
(2)	3.50	1.23	.94	.84	1.54	2.34	2.80	5.21	3.17	.85	.74	.75	2.30	3.17	5.07	8.36	.00	42.81

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5E

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 35.05

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	1	0	0	2	1	1	1	0	1	1	0	1	0	2	1	0	0	13
(1)	.03	.00	.00	.07	.03	.03	.03	.00	.03	.03	.00	.03	.00	.07	.03	.00	.00	.44
(2)	.01	.00	.00	.02	.01	.01	.01	.00	.01	.01	.00	.01	.00	.02	.01	.00	.00	.16
C-3	52	34	21	29	25	51	53	94	118	97	200	186	183	184	205	176	0	1708
(1)	1.77	1.16	.71	.99	.85	1.74	1.80	3.20	4.02	3.30	6.81	6.33	6.23	6.26	6.98	5.99	.00	58.13
(2)	.62	.41	.25	.35	.30	.61	.63	1.12	1.41	1.16	2.39	2.22	2.18	2.19	2.45	2.10	.00	20.37
4-7	27	5	3	1	9	23	58	97	79	40	26	39	87	65	158	187	0	904
(1)	.92	.17	.10	.03	.31	.78	1.97	3.30	2.69	1.36	.88	1.33	2.96	2.21	5.38	6.36	.00	30.77
(2)	.32	.06	.04	.01	.11	.27	.69	1.16	.94	.48	.31	.47	1.04	.78	1.88	2.23	.00	10.78
8-12	7	1	0	0	3	0	3	28	23	2	0	3	27	50	40	73	0	260
(1)	.24	.03	.00	.00	.10	.00	.10	.95	.78	.07	.00	.10	.92	1.70	1.36	2.48	.00	8.85
(2)	.08	.01	.00	.00	.04	.00	.04	.33	.27	.02	.00	.04	.32	.60	.48	.87	.00	3.10
13-18	0	0	0	0	0	0	0	2	6	0	0	0	6	18	17	3	0	52
(1)	.00	.00	.00	.00	.00	.00	.00	.07	.20	.00	.00	.00	.20	.61	.58	.10	.00	1.77
(2)	.00	.00	.00	.00	.00	.00	.00	.02	.07	.00	.00	.00	.07	.21	.20	.04	.00	.62
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.03
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	87	40	24	32	38	75	115	221	227	140	227	228	304	319	422	439	0	2938
(1)	2.96	1.36	.82	1.09	1.29	2.55	3.91	7.52	7.73	4.77	7.73	7.76	10.35	10.86	14.36	14.94	.00	100.00
(2)	1.04	.48	.29	.38	.45	.89	1.37	2.64	2.71	1.67	2.71	2.72	3.63	3.81	5.03	5.24	.00	35.05

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5F

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 13.65

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.09	.00	.00	.09	.00	.26
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.01	.00	.04
C-3	12	9	3	4	8	5	22	31	71	107	247	223	146	63	84	34	0	1069
(1)	1.05	.79	.26	.35	.70	.44	1.92	2.71	6.21	9.35	21.59	19.49	12.76	5.51	7.34	2.97	.00	93.44
(2)	.14	.11	.04	.05	.10	.06	.26	.37	.85	1.28	2.95	2.66	1.74	.75	1.00	.41	.00	12.75
4-7	0	1	0	1	1	2	5	6	6	1	6	5	8	6	12	12	0	72
(1)	.00	.09	.00	.09	.09	.17	.44	.52	.52	.09	.52	.44	.70	.52	1.05	1.05	.00	6.29
(2)	.00	.01	.00	.01	.01	.02	.06	.07	.07	.01	.07	.06	.10	.07	.14	.14	.00	.86
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	12	10	3	5	9	7	27	37	77	108	253	229	155	69	96	47	0	1144
(1)	1.05	.87	.26	.44	.79	.61	2.36	3.23	6.73	9.44	22.12	20.02	13.55	6.03	8.39	4.11	.00	100.00
(2)	.14	.12	.04	.06	.11	.08	.32	.44	.92	1.29	3.02	2.73	1.85	.82	1.15	.56	.00	13.65

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5G

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 4.16

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	9	7	3	5	5	8	8	14	22	46	45	54	37	25	24	16	0	328
(1)	2.58	2.01	.86	1.43	1.43	2.29	2.29	4.01	6.30	13.18	12.89	15.47	10.60	7.16	6.88	4.58	.00	93.98
(2)	.11	.08	.04	.06	.06	.10	.10	.17	.26	.55	.54	.64	.44	.30	.29	.19	.00	3.91
4-7	0	0	0	1	0	0	0	0	1	2	2	2	2	2	4	5	0	21
(1)	.00	.00	.00	.29	.00	.00	.00	.00	.29	.57	.57	.57	.57	.57	1.15	1.43	.00	6.02
(2)	.00	.00	.00	.01	.00	.00	.00	.00	.01	.02	.02	.02	.02	.02	.05	.06	.00	.25
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	9	7	3	6	5	8	8	14	23	48	47	56	39	27	28	21	0	349
(1)	2.58	2.01	.86	1.72	1.43	2.29	2.29	4.01	6.59	13.75	13.47	16.05	11.17	7.74	8.02	6.02	.00	100.00
(2)	.11	.08	.04	.07	.06	.10	.10	.17	.27	.57	.56	.67	.47	.32	.33	.25	.00	4.16

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5H

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS ALL CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ESE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	3	0	0	2	1	1	1	0	1	1	1	1	2	2	2	2	0	20
(1)	.04	.00	.00	.02	.01	.01	.01	.00	.01	.01	.01	.01	.02	.02	.02	.02	.00	.24
(2)	.04	.00	.00	.02	.01	.01	.01	.00	.01	.01	.01	.01	.02	.02	.02	.02	.00	.24
C-3	170	109	86	91	113	143	148	192	257	279	527	486	392	306	375	347	0	4021
(1)	2.03	1.30	1.03	1.09	1.35	1.71	1.77	2.29	3.07	3.33	6.29	5.80	4.68	3.65	4.47	4.14	.00	47.97
(2)	2.03	1.30	1.03	1.09	1.35	1.71	1.77	2.29	3.07	3.33	6.29	5.80	4.68	3.65	4.47	4.14	.00	47.97
4-7	187	54	28	26	89	154	242	410	212	67	53	71	155	126	355	564	0	2793
(1)	2.23	.64	.33	.31	1.06	1.84	2.89	4.89	2.53	.80	.63	.85	1.85	1.50	4.23	6.73	.00	33.32
(2)	2.23	.64	.33	.31	1.06	1.84	2.89	4.89	2.53	.80	.63	.85	1.85	1.50	4.23	6.73	.00	33.32
8-12	79	10	4	1	4	29	23	155	131	21	15	18	130	165	171	315	0	1271
(1)	.94	.12	.05	.01	.05	.35	.27	1.85	1.56	.25	.18	.21	1.55	1.97	2.04	3.76	.00	15.16
(2)	.94	.12	.05	.01	.05	.35	.27	1.85	1.56	.25	.18	.21	1.55	1.97	2.04	3.76	.00	15.16
13-18	3	0	0	0	1	0	0	10	19	6	0	0	18	84	82	44	0	267
(1)	.04	.00	.00	.00	.01	.00	.00	.12	.23	.07	.00	.00	.21	1.00	.98	.52	.00	3.19
(2)	.04	.00	.00	.00	.01	.00	.00	.12	.23	.07	.00	.00	.21	1.00	.98	.52	.00	3.19
19-24	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	4	0	11
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.05	.05	.00	.13
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.05	.05	.00	.13
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	442	173	118	120	208	327	414	767	620	374	596	576	698	685	989	1276	0	8383
(1)	5.27	2.06	1.41	1.43	2.48	3.90	4.94	9.15	7.40	4.46	7.11	6.87	8.33	8.17	11.80	15.22	.00	100.00
(2)	5.27	2.06	1.41	1.43	2.48	3.90	4.94	9.15	7.40	4.46	7.11	6.87	8.33	8.17	11.80	15.22	.00	100.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C=CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6A

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = .57

SPEED MPH	WIND DIRECTION FROM																TOTAL	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NMW		VRBL
CALM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	2.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.08
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
C-3	2	1	1	0	1	4	6	2	0	1	0	0	1	0	0	0	0	19
(1)	4.17	2.08	2.08	.00	2.08	8.33	12.50	4.17	.00	2.08	.00	.00	2.08	.00	.00	.00	.00	39.58
(2)	.02	.01	.01	.00	.01	.05	.07	.02	.00	.01	.00	.00	.01	.00	.00	.00	.00	.23
4-7	1	1	0	0	0	3	2	1	0	0	0	0	0	0	0	2	0	10
(1)	2.08	2.08	.00	.00	.00	6.25	4.17	2.08	.00	.00	.00	.00	.00	.00	.00	4.17	.00	20.83
(2)	.01	.01	.00	.00	.00	.04	.02	.01	.00	.00	.00	.00	.00	.00	.00	.02	.00	.12
8-12	3	0	0	0	0	2	0	1	2	0	0	0	0	0	0	3	0	11
(1)	6.25	.00	.00	.00	.00	4.17	.00	2.08	4.17	.00	.00	.00	.00	.00	.00	6.25	.00	22.92
(2)	.04	.00	.00	.00	.00	.02	.00	.01	.02	.00	.00	.00	.00	.00	.00	.04	.00	.13
13-18	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	6.25	.00	.00	.00	.00	.00	.00	.00	.00	6.25
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.04
19-24	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	4
(1)	2.08	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	6.25	.00	8.33
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.05
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	8	2	1	0	1	9	8	4	5	1	0	0	1	0	0	8	0	48
(1)	16.67	4.17	2.08	.00	2.08	18.75	16.67	8.33	10.42	2.08	.00	.00	2.08	.00	.00	16.67	.00	100.00
(2)	.10	.02	.01	.00	.01	.11	.10	.05	.06	.01	.00	.00	.01	.00	.00	.10	.00	.57

(1) = PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2) = PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C = CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6B

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = 1.30

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	0	0	1	0	2	2	3	0	0	1	0	0	0	0	0	0	0	9
(1)	.00	.00	.92	.00	1.83	1.83	2.75	.00	.00	.92	.00	.00	.00	.00	.00	.00	.00	8.26
(2)	.00	.00	.01	.00	.02	.02	.04	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.11
4-7	2	2	0	0	2	6	1	1	0	0	0	0	0	0	0	1	0	15
(1)	1.83	1.83	.00	.00	1.83	5.50	.92	.92	.00	.00	.00	.00	.00	.00	.00	.92	.00	13.76
(2)	.02	.02	.00	.00	.02	.07	.01	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.18
8-12	9	2	0	1	2	4	10	9	1	0	0	0	0	0	0	6	0	45
(1)	8.26	1.83	.00	.92	1.83	3.67	9.17	8.26	.92	.00	.00	.00	.00	.00	.00	5.50	.00	41.28
(2)	.11	.02	.00	.01	.02	.05	.12	.11	.01	.00	.00	.00	.00	.00	.00	.07	.00	.54
13-18	6	5	0	0	0	0	0	1	2	0	0	0	0	0	0	7	0	21
(1)	5.50	4.59	.00	.00	.00	.00	.00	.92	1.83	.00	.00	.00	.00	.00	.00	6.42	.00	19.27
(2)	.07	.06	.00	.00	.00	.00	.00	.01	.02	.00	.00	.00	.00	.00	.00	.08	.00	.25
19-24	4	0	0	0	0	0	0	0	0	0	0	0	0	1	4	8	0	17
(1)	3.67	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.92	3.67	7.34	.00	15.60
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.05	.10	.00	.20
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.83	.00	.00	.00	1.83
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.02
ALL SPEEDS	21	9	1	1	5	10	8	12	11	2	0	0	0	3	4	22	0	109
(1)	19.27	8.26	.92	4.59	9.17	7.34	11.01	10.09	1.83	.00	.00	.00	.00	2.75	3.67	20.18	.00	100.00
(2)	.25	.11	.01	.01	.06	.12	.10	.14	.13	.02	.00	.00	.00	.04	.05	.26	.00	1.30

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6C

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 3.41

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1	2	0	1	0	0	3	1	0	0	0	0	0	0	0	2	0	10
(1)	.35	.70	.00	.35	.00	.00	1.05	.35	.00	.00	.00	.00	.00	.00	.00	.70	.00	3.50
(2)	.01	.02	.00	.01	.00	.00	.04	.01	.00	.00	.00	.00	.00	.00	.00	.02	.00	.12
4-7	11	4	4	0	3	21	15	7	3	0	0	0	0	0	2	13	0	83
(1)	3.85	1.40	1.40	.00	1.05	7.34	5.24	2.45	1.05	.00	.00	.00	.00	.00	.70	4.55	.00	29.02
(2)	.13	.05	.05	.00	.04	.25	.18	.08	.04	.00	.00	.00	.00	.00	.02	.16	.00	.99
8-12	20	6	2	1	0	4	8	12	19	5	2	0	2	1	1	14	0	97
(1)	6.99	2.10	.70	.35	.00	1.40	2.80	4.20	6.64	1.75	.70	.00	.70	.35	.35	4.90	.00	33.92
(2)	.24	.07	.02	.01	.00	.05	.10	.14	.23	.06	.02	.00	.02	.01	.01	.17	.00	1.16
13-18	11	3	2	0	0	1	1	1	10	2	6	2	7	6	3	13	0	68
(1)	3.85	1.05	.70	.00	.00	.35	.35	.35	3.50	.70	2.10	.70	2.45	2.10	1.05	4.55	.00	23.78
(2)	.13	.04	.02	.00	.00	.01	.01	.01	.12	.02	.07	.02	.08	.07	.04	.16	.00	.81
19-24	5	0	0	0	0	0	0	0	4	0	0	0	1	3	4	6	0	23
(1)	1.75	.00	.00	.00	.00	.00	.00	.00	1.40	.00	.00	.00	.35	1.05	1.40	2.10	.00	8.04
(2)	.06	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.01	.04	.05	.07	.00	.27
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	0	5
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.05	.35	.35	.00	1.75
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.01	.01	.00	.06
ALL SPEEDS	48	15	8	2	3	26	27	21	36	7	8	2	10	13	11	49	0	286
(1)	16.78	5.24	2.80	.70	1.05	9.09	9.44	7.34	12.59	2.45	2.80	.70	3.50	4.55	3.85	17.13	.00	100.00
(2)	.57	.18	.10	.02	.04	.31	.32	.25	.43	.08	.10	.02	.12	.16	.13	.58	.00	3.41

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6D

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 46.99

SPEED MPH	WIND DIRECTION FROM																TOTAL
	N	NNE	NE	ESE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	VRBL	
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	53	38	32	40	39	41	75	51	27	13	4	11	10	15	23	54	0
(1)	1.35	.96	.81	1.02	.99	1.04	1.90	1.29	.69	.33	.10	.28	.25	.38	.58	1.37	.00
(2)	.63	.45	.38	.48	.47	.49	.89	.61	.32	.16	.05	.13	.12	.18	.27	.64	.00
4-7	104	48	37	38	33	72	127	140	104	13	10	9	19	25	30	189	0
(1)	2.64	1.22	.94	.96	.84	1.83	3.22	3.55	2.64	.33	.25	.23	.48	.63	.76	4.80	.00
(2)	1.24	.57	.44	.45	.39	.86	1.51	1.67	1.24	.16	.12	.11	.23	.30	.36	2.25	.00
8-12	146	36	6	1	8	31	71	169	241	45	22	28	74	73	55	255	0
(1)	3.71	.91	.15	.03	.20	.79	1.80	4.29	6.12	1.14	.56	.71	1.88	1.85	1.40	6.47	.00
(2)	1.74	.43	.07	.01	.10	.37	.85	2.02	2.87	.54	.26	.33	.88	.87	.66	3.04	.00
13-18	85	11	2	3	0	8	12	23	139	28	9	16	73	137	94	227	0
(1)	2.16	.28	.05	.08	.00	.20	.30	.58	3.53	.71	.23	.41	1.85	3.48	2.39	5.76	.00
(2)	1.01	.13	.02	.04	.00	.10	.14	.27	1.66	.33	.11	.19	.87	1.63	1.12	2.71	.00
19-24	20	2	0	0	0	2	3	1	17	6	2	1	7	46	34	94	0
(1)	.51	.05	.00	.00	.00	.05	.08	.03	.43	.15	.05	.03	.18	1.17	.86	2.39	.00
(2)	.24	.02	.00	.00	.00	.02	.04	.01	.20	.07	.02	.01	.08	.55	.41	1.12	.00
GT 24	4	0	0	0	0	0	0	0	0	0	0	0	2	4	6	35	0
(1)	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.10	.15	.89	.00
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.05	.07	.42	.00
ALL SPEEDS	412	135	77	82	80	154	288	384	528	105	47	65	185	300	242	855	0
(1)	10.46	3.43	1.95	2.08	2.03	3.91	7.31	9.75	13.40	2.67	1.19	1.65	4.70	7.62	6.14	21.71	.00
(2)	4.91	1.61	.92	.98	.95	1.84	3.44	4.58	6.30	1.25	.56	.78	2.21	3.58	2.89	10.20	.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6E

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 33.90

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	1	1	1	2	0	0	0	0	0	1	0	0	0	0	0	6
(1)	.00	.00	.04	.04	.04	.07	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00	.21
(2)	.00	.00	.01	.01	.01	.02	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.07
C-3	122	78	52	50	65	102	107	68	40	16	8	9	10	19	36	78	0	860
(1)	4.29	2.74	1.83	1.76	2.29	3.59	3.76	2.39	1.41	.56	.28	.32	.35	.67	1.27	2.74	.00	30.26
(2)	1.46	.93	.62	.60	.78	1.22	1.28	.81	.48	.19	.10	.11	.12	.23	.43	.93	.00	10.26
4-7	131	24	10	9	11	40	134	152	72	29	16	12	21	22	32	296	0	1011
(1)	4.61	.84	.35	.32	.39	1.41	4.71	5.35	2.53	1.02	.56	.42	.74	.77	1.13	10.42	.00	35.57
(2)	1.56	.29	.12	.11	.13	.48	1.60	1.81	.86	.35	.19	.14	.25	.26	.38	3.53	.00	12.06
8-12	79	11	1	1	4	5	26	63	75	35	28	20	48	38	30	206	0	670
(1)	2.78	.39	.04	.04	.14	.18	.91	2.22	2.64	1.23	.99	.70	1.69	1.34	1.06	7.25	.00	23.57
(2)	.94	.13	.01	.01	.05	.06	.31	.75	.89	.42	.33	.24	.57	.45	.36	2.46	.00	7.99
13-18	10	1	1	0	2	4	4	6	42	11	5	1	16	33	8	94	0	238
(1)	.35	.04	.04	.00	.07	.14	.14	.21	1.48	.39	.18	.04	.56	1.16	.28	3.31	.00	8.37
(2)	.12	.01	.01	.00	.02	.05	.05	.07	.50	.13	.06	.01	.19	.39	.10	1.12	.00	2.84
19-24	8	0	1	1	0	0	0	0	15	0	0	0	2	4	2	19	0	52
(1)	.28	.00	.04	.04	.00	.00	.00	.00	.53	.00	.00	.00	.07	.14	.07	.67	.00	1.83
(2)	.10	.00	.01	.01	.00	.00	.00	.00	.18	.00	.00	.00	.02	.05	.02	.23	.00	.62
GT 24	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	5
(1)	.00	.00	.00	.00	.00	.04	.00	.00	.04	.00	.00	.00	.00	.00	.00	.11	.00	.18
(2)	.00	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.00	.00	.00	.04	.00	.06
ALL SPEEDS	350	114	66	62	83	154	271	289	245	91	57	43	97	116	108	696	0	2842
(1)	12.32	4.01	2.32	2.18	2.92	5.42	9.54	10.17	8.62	3.20	2.01	1.51	3.41	4.08	3.80	24.49	.00	100.00
(2)	4.18	1.36	.79	.74	.99	1.84	3.23	3.45	2.92	1.09	.68	.51	1.16	1.38	1.29	8.30	.00	33.90

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE

(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD

C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6F

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 11.74

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	1	1	0	0	2	0	0	0	0	0	0	1	1	0	0	6
(1)	.00	.00	.10	.10	.00	.00	.20	.00	.00	.00	.00	.00	.00	.10	.10	.00	.00	.61
(2)	.00	.00	.01	.01	.00	.00	.02	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.07
C-3	41	31	33	21	30	35	48	32	22	14	7	7	8	13	16	34	0	392
(1)	4.17	3.15	3.35	2.13	3.05	3.56	4.88	3.25	2.24	1.42	.71	.71	.81	1.32	1.63	3.46	.00	39.84
(2)	.49	.37	.39	.25	.36	.42	.57	.38	.26	.17	.08	.08	.10	.16	.19	.41	.00	4.68
4-7	43	7	3	5	11	21	64	71	32	12	9	15	15	14	20	97	0	439
(1)	4.37	.71	.30	.51	1.12	2.13	6.50	7.22	3.25	1.22	.91	1.52	1.52	1.42	2.03	9.86	.00	44.61
(2)	.51	.08	.04	.06	.13	.25	.76	.85	.38	.14	.11	.18	.18	.17	.24	1.16	.00	5.24
8-12	15	1	1	0	1	1	21	12	9	6	8	4	7	7	10	38	0	141
(1)	1.52	.10	.10	.00	.10	.10	2.13	1.22	.91	.61	.81	.41	.71	.71	1.02	3.86	.00	14.33
(2)	.18	.01	.01	.00	.01	.01	.25	.14	.11	.07	.10	.05	.08	.08	.12	.45	.00	1.68
13-18	0	0	0	0	0	0	0	0	3	0	0	0	0	1	1	0	0	6
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.30	.00	.00	.00	.00	.10	.10	.00	.00	.61
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.01	.01	.00	.00	.07
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	99	39	38	27	42	57	135	115	66	32	24	26	30	36	48	170	0	984
(1)	10.06	3.96	3.86	2.74	4.27	5.79	13.72	11.69	6.71	3.25	2.44	2.64	3.05	3.66	4.88	17.28	.00	100.00
(2)	1.18	.47	.45	.32	.50	.68	1.61	1.37	.79	.38	.29	.31	.36	.43	.57	2.03	.00	11.74

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

# TABLE 6G

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA      STABILITY CLASS G      CLASS FREQUENCY (PERCENT) = 2.09

WIND DIRECTION FROM

SPEED MPH	WIND DIRECTION FROM																TOTAL	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		VRBL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	3	1	0	3	2	6	8	2	0	2	1	1	4	2	1	4	2	1
(1)	1.71	.57	.00	1.71	1.14	3.43	4.57	1.14	.00	1.14	.57	.57	2.29	1.14	.57	2.29	1.14	.57
(2)	.04	.01	.00	.04	.02	.07	.10	.02	.00	.02	.01	.01	.05	.02	.01	.05	.02	.01
4-7	3	0	0	1	2	8	13	20	13	2	3	2	4	2	4	2	4	6
(1)	1.71	.00	.00	.57	1.14	4.57	7.43	11.43	7.43	1.14	1.71	1.14	2.29	1.14	2.29	1.14	2.29	3.43
(2)	.04	.00	.00	.01	.02	.10	.16	.24	.16	.02	.04	.02	.05	.02	.05	.02	.05	.07
8-12	0	0	0	0	0	0	6	10	4	2	2	3	5	7	0	7	0	7
(1)	.00	.00	.00	.00	.00	.00	3.43	5.71	2.29	1.14	1.14	1.71	2.86	4.00	.00	4.00	.00	4.00
(2)	.00	.00	.00	.00	.00	.00	.07	.12	.05	.02	.02	.04	.06	.08	.00	.08	.00	.08
13-18	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.57	.00	.00	.00	.00	.57	.00	.00	.00	.57
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.01	.00	.00	.00	.01
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	6	1	0	4	4	14	27	38	20	4	7	6	10	14	6	14	6	14
(1)	3.43	.57	.00	2.29	2.29	8.00	15.43	21.71	11.43	2.29	4.00	3.43	5.71	8.00	3.43	8.00	3.43	8.00
(2)	.07	.01	.00	.05	.05	.17	.32	.45	.24	.05	.08	.07	.12	.17	.07	.17	.07	.17

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE  
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6H

VERMONT YANKEE JAN 11 - DEC 11 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS ALL CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ESE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	1	0	2	2	1	2	2	0	0	0	0	1	0	1	1	1	0	14
(1)	.01	.00	.02	.02	.01	.02	.02	.00	.00	.00	.00	.01	.00	.01	.01	.01	.00	.17
(2)	.01	.00	.02	.02	.01	.02	.02	.00	.00	.00	.00	.01	.00	.01	.01	.01	.00	.17
C-3	222	151	119	115	139	190	250	162	91	45	21	28	30	51	77	169	0	1860
(1)	2.65	1.80	1.42	1.37	1.66	2.27	2.98	1.93	1.09	.54	.25	.33	.36	.61	.92	2.02	.00	22.19
(2)	2.65	1.80	1.42	1.37	1.66	2.27	2.98	1.93	1.09	.54	.25	.33	.36	.61	.92	2.02	.00	22.19
4-7	295	86	54	53	62	171	356	392	224	56	38	38	59	63	88	604	0	2639
(1)	3.52	1.03	.64	.63	.74	2.04	4.25	4.68	2.67	.67	.45	.45	.70	.75	1.05	7.21	.00	31.48
(2)	3.52	1.03	.64	.63	.74	2.04	4.25	4.68	2.67	.67	.45	.45	.70	.75	1.05	7.21	.00	31.48
8-12	272	56	10	4	14	45	136	277	359	94	62	55	136	126	96	529	0	2271
(1)	3.24	.67	.12	.05	.17	.54	1.62	3.30	4.28	1.12	.74	.66	1.62	1.50	1.15	6.31	.00	27.09
(2)	3.24	.67	.12	.05	.17	.54	1.62	3.30	4.28	1.12	.74	.66	1.62	1.50	1.15	6.31	.00	27.09
13-18	112	20	5	3	2	13	17	31	200	41	20	19	96	178	106	342	0	1205
(1)	1.34	.24	.06	.04	.02	.16	.20	.37	2.39	.49	.24	.23	1.15	2.12	1.26	4.08	.00	14.37
(2)	1.34	.24	.06	.04	.02	.16	.20	.37	2.39	.49	.24	.23	1.15	2.12	1.26	4.08	.00	14.37
19-24	38	2	1	1	0	2	3	1	36	6	2	1	10	54	44	130	0	331
(1)	.45	.02	.01	.01	.00	.02	.04	.01	.43	.07	.02	.01	.12	.64	.52	1.55	.00	3.95
(2)	.45	.02	.01	.01	.00	.02	.04	.01	.43	.07	.02	.01	.12	.64	.52	1.55	.00	3.95
GT 24	4	0	0	0	0	1	0	0	1	0	0	0	2	9	7	39	0	63
(1)	.05	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.02	.11	.08	.47	.00	.75
(2)	.05	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.02	.11	.08	.47	.00	.75
ALL SPEEDS	944	315	191	178	218	424	764	863	911	242	143	142	333	482	419	1814	0	8383
(1)	11.26	3.76	2.28	2.12	2.60	5.06	9.11	10.29	10.87	2.89	1.71	1.69	3.97	5.75	5.00	21.64	.00	100.00
(2)	11.26	3.76	2.28	2.12	2.60	5.06	9.11	10.29	10.87	2.89	1.71	1.69	3.97	5.75	5.00	21.64	.00	100.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 (2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD  
 C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

APPENDIX A

SUPPLEMENTAL INFORMATION

Facility: Vermont Yankee Nuclear Power Station

Licensee: Entergy Nuclear Vermont Yankee

1A. ODCM DOSE AND DOSE RATE LIMITS -

<u>ODCM Controls</u>	<u>Dose Limit</u>
a. <u>Noble Gases</u>	
3/4.3.1 Total body dose rate	500 mrem/yr
3/4.3.1 Skin dose rate	3000 mrem/yr
3/4.3.2 Gamma air dose	5 mrad in a quarter
3/4.3.2 Gamma air dose	10 mrad in a year
3/4.3.2 Beta air dose	10 mrad in a quarter
3/4.3.2 Beta air dose	20 mrad in a year
b. <u>Iodine-131, Iodine-133, Tritium and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days</u>	
3/4.3.1 Organ dose rate	1500 mrem/yr
3/4.3.3 Organ dose	7.5 mrem in a quarter
3/4.3.3 Organ dose	15 mrem in a year
c. <u>Liquids</u>	
3/4.2.2 Total body dose	1.5 mrem in a quarter
3/4.2.2 Total body dose	3 mrem in a year
3/4.2.2 Organ dose	5 mrem in a quarter
3/4.2.2 Organ dose	10 mrem in a year

2A. ODCM LIMITS - CONCENTRATION

<u>ODCM Control</u>	<u>Limit</u>
a. <u>Noble Gases</u>	No ECL Limits
b. <u>Iodine-131, Iodine-133, Tritium and Radionuclides in Particulate Form With Half-Lives</u>	
Greater Than 8 Days	No ECL Limits

c. Liquids

3/4.2.1 Sum of the fractions of ECL  
excluding noble gases  
(10CFR20, Appendix B,  
Table 2, Column 2):  $\leq 1.0E+01$

3/4.2.1 Total noble gas concentration:  $\leq 2E-04 \mu\text{Ci/cc}$

3. AVERAGE ENERGY

Provided below are the average energy (E) of the radionuclide mixture in releases of fission and activation gases, if applicable.

- a. Average gamma energy: Not Applicable
- b. Average beta energy: Not Applicable

4. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

Provided below are the methods used to measure or approximate the total radioactivity in effluents and the methods used to determine radionuclide composition.

a. Fission and Activation Gases

Continuous stack monitors monitor the gross Noble Gas radioactivity released from the plant stack. Because release rates are normally below the detection limit of these monitors, periodic grab samples are taken and analyzed for the gaseous isotopes present. These are used to calculate the individual isotopic releases indicated in Table 1B and the totals of Table 1A. The error involved in these steps may be approximately  $\pm 23$  percent.

b. Iodines

Continuous isokinetic samples are drawn from the plant stack through a particulate filter and charcoal cartridge. The filters and cartridges are normally removed weekly and are analyzed for Iodine-131, 132, 133, 134, and 135. The error involved in these steps may be approximately  $\pm 18$  percent.

c. Particulates

The particulate filters described in b. above are also counted for particulate radioactivity. The error involved in this sample is also approximately  $\pm 18$  percent.

d. Tritium

ODCM Table 4.3.1 requires as a minimum that grab samples from the plant stack be taken monthly and analyzed for tritium. The stack tritium collection has been upgraded with silica gel columns and continuous sampling of stack effluents. The error involved in this sample is approximately  $\pm 10$  percent.

e. Waste Oil

Prior to issuing the permit to burn a drum of radioactively contaminated waste oil, one liter of the oil is analyzed by gamma spectroscopy to determine concentrations of radionuclides that meet or exceed the LLD for all of the liquid phase radionuclides listed in ODCM Table 4.2.1.

Monthly, samples from drums that were issued burn permits are sent to the contracted laboratory for compositing and analysis. The lab analyzes for tritium, alpha, Fe-55, Sr-89, and Sr-90 on the composite sample.

The error involved in this sample is approximately  $\pm 15$  percent.

f. Liquid Effluents

If radioactive liquid effluents are to be released from the facility, they are continuously monitored. Measurements are also required on a representative sample of each batch of radioactive liquid effluents released. For each batch, station records are retained of the total activity (mCi) released, concentration ( $\mu\text{Ci/ml}$ ) of gross radioactivity, volume (liters), and approximate total quantity of water (liters) used to dilute the liquid effluent prior to release to the Connecticut River.

Each batch of radioactive liquid effluents to be released is analyzed for gross gamma and gamma isotopic radioactivity. A monthly proportional composite sample, comprising an aliquot of each batch released during a month, is analyzed for tritium and gross alpha radioactivity. A quarterly proportional composite sample, comprising an aliquot of each batch released during a quarter, is analyzed for Sr-89, Sr-90, and Fe-55.

5. **BATCH RELEASES**

a. **Liquid**

There were no routine liquid batch releases during the reporting period.

b. **Gaseous**

There were no routine gaseous batch releases during the reporting period.

6. **ABNORMAL RELEASES**

a. **Liquid**

1) In 2011 there was a continuous release due to a previously undetected leak from a subsurface structure. The leak condition was identified through monitoring well data in January 2010. The leak was stopped in February 2010.

2) For 2011, the total Tritium radioactivity conservatively estimated to be released to the Connecticut River is 2.82 Curies. No other plant-related radionuclides were detected in ground water.

b. **Gaseous**

There were no non-routine gaseous releases (measured) during the reporting period.

## APPENDIX B

### LIQUID HOLDUP TANKS

<b><u>Requirement</u></b>	Technical Specification 3.8.D.1 limits the quantity of radioactive material contained in any outside tank. With the quantity of radioactive material in any outside tank exceeding the limits of Technical Specification 3.8.D.1, a description of the events leading to this condition is required in the next annual Radioactive Effluent Release Report per ODCM Section 10.1.
<b><u>Response:</u></b>	The limits of Technical Specification 3.8.D.1 were not exceeded during this reporting period.

## APPENDIX C

### RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

**Requirement:** Radioactive liquid effluent monitoring instrumentation channels are required to be operable in accordance with ODCM Table 3.1.1. If an inoperable radioactive liquid effluent monitoring instrument is not returned to operable status prior to a release pursuant to Note 4 of Table 3.1.1, an explanation in the next annual Radioactive Effluent Release Report of the reason(s) for delay in correcting the inoperability are required per ODCM Section 10.1.

**Response:** Since the requirements of ODCM Table 3.1.1 governing the operability of radioactive liquid effluent monitoring instrumentation were met for this reporting period, no response is required.

## APPENDIX D

### RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

**Requirement:** Radioactive gaseous effluent monitoring instrumentation channels are required to be operable in accordance with ODCM Table 3.1.2. If inoperable gaseous effluent monitoring instrumentation is not returned to operable status within 30 days pursuant to Note 5 of Table 3.1.2, an explanation in the next annual Radioactive Effluent Release Report of the reason(s) for the delay in correcting the inoperability is required per ODCM Section 10.1.

**Response:** Since the requirements of ODCM Table 3.1.2 governing the operability of radioactive gaseous effluent monitoring instrumentation were met for this reporting period, no response is required.

## APPENDIX E

### RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

**Requirement:** The radiological environmental monitoring program is conducted in accordance with ODCM Control 3/4.5.1. With milk samples no longer available from one or more of the sample locations required by ODCM Table 3.5.1, ODCM 10.1 requires the following to be included in the next annual Radioactive Effluent Release Report: (1) identify the cause(s) of the sample(s) no longer being available, (2) identify the new location(s) for obtaining available replacement samples and (3) include revised ODCM figure(s) and table(s) reflecting the new location(s).

**Response:** No changes were needed in the milk sampling locations as specified in ODCM Table 3.5.1 and implemented in ODCM Table 7.1 during the reporting year.

## APPENDIX F

### LAND USE CENSUS

**Requirement:** A land use census is conducted in accordance with ODCM Control 3/4.5.2. With a land use census identifying a location(s) that yields at least a 20 percent greater dose or dose commitment than the values currently being calculated pursuant to ODCM Control 4.3.3, the new location(s) must be identified in the next Annual Radioactive Effluent Release Report.

**Response:** The Land Use Census was completed during the third quarter of 2011. No locations were identified which yielded a 20 percent greater dose or dose commitment than the values currently being calculated pursuant to ODCM Control 4.3.3.

## APPENDIX G

### PROCESS CONTROL PROGRAM

**Requirement:** ODCM Section 10.1 requires that licensee initiated changes to the Process Control Program (PCP) be submitted to the Commission in the annual Radioactive Effluent Release Report for the period in which the change(s) was made.

**Response:** There were no changes made to the Process Control Program during this reporting period.

## APPENDIX H

### OFF-SITE DOSE CALCULATION MANUAL

**Requirement:** Technical Specification 6.7.B.1 requires that licensee initiated changes to the Off-Site Dose Calculation Manual (ODCM) be submitted to the Commission in the annual Radioactive Effluent Release Report for the period in which the change(s) was made effective.

**Response:** During the reporting period, Revision 34 was made to the ODCM.

Four main sections of the ODCM were modified with significant changes to incorporate the contaminated groundwater discharge pathway to the Connecticut River:

- Section 3 / 4 was revised to include the subsurface groundwater pathway in the Liquids Discharge description. Groundwater monitoring wells used to determine the extent of these releases are listed. The Southwest Well was added as Ground (Potable Drinking) Water sample location in the REMP description of Section 3 / 4.
- Section 5 was revised to include a description of the determination of plant generated radionuclide concentrations in groundwater discharges.
- Section 6 was revised to include methods for calculating radiation dose from plant generated radionuclides in groundwater discharges.
- Section 9 was revised to include the method for determination of groundwater flows in the 17 identified streamtubes flowing from the plant site to the Connecticut River.

In addition to revisions of four main sections of the ODCM, the Table of Contents, Definitions, and References Sections of the ODCM were revised to reflect the additional subsections, figures, tables, definitions and references in the ODCM.

## APPENDIX I

### RADIOACTIVE LIQUID, GASEOUS, AND SOLID WASTE TREATMENT SYSTEMS

**Requirement:** ODCM Section 10.4 requires that licensee initiated major changes to the radioactive waste systems (liquid, gaseous, and solid) be reported to the Commission in the annual Radioactive Effluent Release Report for the period in which the evaluation was reviewed by the Plant Operation Review Committee.

**Response:** There were no licensee-initiated major changes to the radioactive waste systems during this reporting period.

APPENDIX J

ON-SITE DISPOSAL OF SEPTIC/SILT/SOIL WASTE

**Requirement:** Off-Site Dose Calculation Manual, Appendices B, F and I require that the dose impact due to on-site disposal of septic waste, cooling tower silt, and sand/soil type materials during the reporting year and from previous years be reported to the Nuclear Regulatory Commission in the annual Radioactive Effluent Report if disposals occur during the reporting year. Entergy Nuclear Vermont Yankee will report in the Annual Radioactive Effluent Release Report a list of the radionuclides present and the total radioactivity associated with the on-site disposal activities on the Vermont Yankee site.

**Response:** There was one on-site disposal spreading activity of 11,000 gallons of contaminated septic waste during July of the reporting year, and no spreading activities for cooling tower silt or sand/soil type materials. The total radioactivity spread on the 1.9 acres (southern) on-site disposal field from the 2011 spreading and from previous years was as follows:

<u>Radionuclide</u>	Activity Spread in 2011 (Ci)	Activity from 2011, Plus Activity from All Past Disposals Decayed to 7/28/2011 (Ci)
Mn-54	0	3.60E-07
Co-60	4.79E-06	2.12E-05
Zn-65	0	2.82E-07
Cs-134	0	2.77E-09
Cs-137	0	8.26E-05

The maximum organ dose from all past spreading operations, including the material spread in 2011, totaled 1.26E-01 mrem/year. These calculated values are within the 1 mrem/year limit applied during the period of operational control of the site. The projected hypothetical "intruder" dose for the period following the loss of operational control of the site area due to all spreading operations to-date is 5.90E-01 mrem/year versus a 5 mrem/year dose limit. Note that the extension of the plant license has not been factored in to the "intruder dose" at this time.