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May 15, 2013

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

SUBJECT: 2012 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, enclosed is a copy of the annual 2012 Radioactive Effluent Release Report.

In addition, VY TS 6.7.B requires reporting of changes to the Off-Site Dose Calculation Manual (ODCM). There were no changes made to the ODCM during 2012.

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,

A handwritten signature in black ink that reads "Robert J. Wanczyk".

[RJW/plc]

Enclosure: 1. Radioactive Effluent Release Report for 2012

cc listing (next page)

IE48  
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RADIOACTIVE EFFLUENT  
RELEASE REPORT  
FOR 2012  
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 2012**

[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 2012 in response to the ALARA objectives of 10 CFR Part 50, 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 2012. Radioactive effluents reported in Tables 1 and 2 were used to determine the dose to the maximum exposed individual for 2012.

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), Section 10.1 (Reference 1). 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. As discussed in Section 3.6, there were no such recreational activities permitted and, therefore, there is no associated dose assessment.

An 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 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," is 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 assessment is required. However, Table 4B does provide the combination of off-site doses and dose commitments from plant effluents and direct radiation sources for the limiting member of the public as a demonstration of compliance with the dose standards of 40 CFR Part 190.

All calculated dose estimates for members of the public at the site boundary or beyond for the 2012 annual reporting period are below the dose criteria of 10 CFR Part 50, Appendix I, and 40 CFR Part 190.

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 2012 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 Safety Guide 23 (Reference 3) 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 4). A source depletion model as described in "Meteorology and Atomic Energy - 1968" (Reference 5) 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,  $\chi/Q$  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 2012 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 10 CFR Part 50, Appendix I. By implementing the requirements of 10 CFR 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 past 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 2012, 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 2012 was generated and reported in Table 2A.

For the projected ground water flow into the Connecticut River in 2012, 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 (2,675 cfs in August 2012) for dilution. All irrigation exposure pathways for the consumption of food products grown with irrigated water occur below Vernon Dam and assume the lowest 2012 quarterly average growing season river flow value (3,199 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 (3,199 cfs in the third quarter) as a conservative estimate of river dilution for all four quarters of the year. The dose models are taken from Regulatory Guide 1.109 (Reference 2) 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 10 CFR Part 50, Appendix I dose criteria of ODCM 3/4.2.2. Table 4B provides an estimate of the total annual dose impact (including contribution from liquids) associated with the highest exposed member of the public for demonstration of compliance to the dose standard contained in 40 CFR 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 10 CFR Part 50, Appendix I. By implementing these, 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."

Dose estimates due to the release of noble gases to the atmosphere are typically calculated at the site boundary, at the nearest resident in each of the sixteen principal compass directions, at the point of highest off-site ground level air concentration of radioactive materials, and at each of the milk animal locations located within five miles of the plant. For 2012, noble gases were detected in effluents released from the plant stack in the second quarter only.

The maximum estimated quarterly and annual air doses due to noble gases at any of the off-site locations are reported in Table 4A. These estimated air doses are well below the 10 CFR Part 50, Appendix I dose criteria of ODCM 3/4.3.2. Table 4B lists the annual dose impact from gaseous effluents (including noble gases) at the overall highest impacted resident location after consideration of all exposure categories (i.e., liquid, gas, and fixed radiation sources). Table 4B provides an estimation of the total annual dose impact associated with the highest exposed member of the public for demonstration of compliance to the dose standard contained in 40 CFR Part 190 for the uranium fuel cycle.

### 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 10 CFR Part 50, Appendix I (7.5 mrem per quarter and 15 mrem per year). By implementing the requirements of 10 CFR 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 2012, 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 6) 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 2012.

The primary exposure pathways associated with Carbon-14 include inhalation and ingestion of food products that have incorporated Carbon-14 (in the form of  $CO_2$ ) 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 10 CFR 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 iodines and particulates) associated with the highest exposed member of the public for demonstration of compliance with the dose standard contained in 40 CFR 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) are exposed to any significant direct radiation.

A correlation method was derived, based 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 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 projected to impact 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.

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 2012, this annual dose was below the 25 mrem total body and organ limit, as well as the 75 mrem thyroid limit, of 40 CFR Part 190.

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

ODCM Appendices B, F, and I require that all septic waste, cooling tower silt, and sand/soil applied within the approved designated disposal areas be controlled to ensure the dose to a maximally exposed individual during the period of Vermont Yankee site control is limited to 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 limited to 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 2012 (in which no radioactivity was detected), based on the combined dose from this spreading and all past spreadings.

### 3.6 On-Site Recreational Activities

During 2012, no access to the on-site boat launching ramp located north of the intake structure was permitted for employees, their families, and guests. As such, there was 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 July 8, 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 10 CFR Part 50, Appendix I," U. S. Nuclear Regulatory Commission, Office of Standards Development, Revision 1, October 1977.
3. Safety Guide 1.23, "Onsite Meteorological Programs," U.S. Atomic Energy Commission, February 17, 1972.
4. 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.
5. Meteorology and Atomic Energy, 1968, Section 5-3.2.2, "Cloud Depletion," page 204, U. S. Atomic Energy Commission, July 1968.
6. 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 2012  
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	8.02E-02	±2.30E+01
2. Average release rate for period	µCi/sec	ND	1.00E-02	
3. Percent of ODCM limit (1)	%	ND	3.08E-03	
<b>B. Iodines</b>				
1. Total Iodine	Ci	ND	1.65E-04	±1.80E+01
2. Average release rate for period	µCi/sec	ND	2.07E-05	
3. Percent of ODCM limit (2)	%	(3)	(3)	
<b>C. Particulates</b>				
1. Particulates with T-1/2>8 days	Ci	ND	4.54E-05	±1.80E+01
2. Average release rate for period	µCi/sec	ND	5.71E-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	2.33E-01	1.42E+00	±1.00E+01
2. Average release rate for period	µCi/sec	2.93E-02	1.79E-01	
3. Percent of ODCM limit (3)	%	(3)	(3)	
<b>E. Carbon-14</b>				
1. Total release	Ci	1.91E+00	1.93E+00	(6)
2. Average release rate for period	µCi/sec	2.43E-01	2.45E-01	
3. Percent of ODCM limit (5)	%	7.41E+00	7.530E+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, the dose contribution from Tritium, Iodines, and particulates are included with Carbon-14 in Part E.
- (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 2012**  
**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	3.31E-05	7.98E-06	±1.80E+01
2. Average release rate for period	μCi/sec	4.16E-06	1.00E-06	
3. Percent of ODCM limit (2)	%	(3)	(3)	
<b>C. Particulates</b>				
1. Particulates with T-1/2>8 days	Ci	ND	1.76E-05	±1.80E+01
2. Average release rate for period	μCi/sec	ND	2.21E-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	1.56E+00	6.27E-01	±1.00E+01
2. Average release rate for period	μCi/sec	1.96E-01	7.89E-02	
3. Percent of ODCM limit (3)	%	(3)	(3)	
<b>E. Carbon-14</b>				
1. Total release	Ci	1.87E+00	1.88E+00	(6)
2. Average release rate for period	μCi/sec	2.35E-01	2.37E-01	
3. Percent of ODCM limit (5)	%	7.28E+00	7.28E+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, the dose contributions from Tritium, Iodines, and particulates are included with Carbon-14 in Part E.
- (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 IB**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2012  
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	8.02E-02		
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>8.02E-02</b>	<b>(1)</b>	<b>(1)</b>
<b>2. Iodines</b>					
Iodine-131	Ci	ND	1.33E-05		
Iodine-133	Ci	ND	1.52E-04		
Iodine-135	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>1.65E-04</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	4.54E-05		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>4.54E-05</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 2012**  
**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	4.43E-06	7.98E-06		
Iodine-133	Ci	2.87E-05	ND		
Iodine-135	Ci	ND	ND		
<b>Total for Period</b>	<b>Ci</b>	<b>3.31E-05</b>	<b>7.98E-06</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	7.15E-06		
Cerium-141	Ci	ND	ND		
Cerium-144	Ci	ND	ND		
Zinc-65	Ci	ND	1.04E-05		
<b>Total for Period</b>	<b>Ci</b>	<b>ND</b>	<b>1.76E-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 2012  
Gaseous Effluents - Ground Level Releases <sup>(2)</sup>**

	Units	Continuous Mode		Batch Mode	
		Quarter		Quarter	
<b>Nuclides Released</b>		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 2012.

**TABLE IC**  
(Continued)

**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report for 2012**  
**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 2012.

TABLE 1D

Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2012  
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 2012  
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	3.09E-02	2.74E-02	±2.00E+01
2. Average Diluted Concentration During Period	μCi/ml	7.60E-06	6.43E-06	
3. Percent of Applicable Limit (1)	%	3.07E-04	2.72E-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 to the total body) 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 0.76%, 0.64%, 0.63%, and 0.48% 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 2012.
- (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 2012. An Estimated Total Error is not applicable.

**TABLE 2A**  
(Continued)

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2012  
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	2.65E-02	2.14E-02	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	6.34E-06	4.78E-06	
3. Percent of Applicable Limit (1)	%	2.64E-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 to the total body) 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 0.76%, 0.64%, 0.63%, and 0.48% 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 2012.
- (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 2012. An Estimated Total Error is not applicable.

**TABLE 2B**

**Entergy Nuclear Vermont Yankee  
Effluent and Waste Disposal Annual Report for 2012  
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	-	-	-	-

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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 2012**  
**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 2012**  
**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	1.61E+01	±25%
	Cl	6.90E+01	±25%
b. Dry Compressible waste, equipment, etc.	m3	8.20E+01	±25%
	Cl	3.68E-01	±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	0.16%	Chromium 51	5.88%	None	N/A
Chromium 51	2.20%	Manganese-54	2.37%		
Manganese-54	5.11%	Iron-55	44.68%		
Iron-55	29.31%	Iron 59	0.52%		
Cobalt 58	1.30%	Cobalt 58	0.66%		
Cobalt-60	31.42%	Cobalt-60	29.43%		
Nickel-63	5.51%	Nickel-63	0.70%		
Zinc-65	18.48%	Zinc-65	15.30%		
Strontium-89	1.58%	Zirconium 95	0.12%		
Strontium-90	0.15%	Niobium 95	0.21%		
Cesium 137	10.54%	Silver 110m	0.11%		
		Antimony 124	0.31%		

(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
8	X		Truck	ES-GR / ES BCO, TN	
12		X	Truck		ES Clive

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

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

Supplemental Information	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 = Gellaher Road  
 BCO = Bear Creek Operations  
 WCS = Waste Control Specialists  
 ES = Energy Solutions  
 GDC = General Design Container

Completed By:

Reviewed By:

*Mark Y. Vandate* (Tungell)  
*M. Vandate / Mark Y. Vandate*  
 3-27-13



**Table-3**  
**Entergy Nuclear Vermont Yankee**  
**Effluent and Waste Disposal Annual Report**  
**Third and Fourth Quarters for 2012**  
**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	5.03E+01	±25%
	Ci	4.94E+02	±25%
b. Dry Compressible waste, equipment, etc.	m3	None	N/A
	Ci	None	N/A
c. Irradiated components, control rods, etc.	m3	None	N/A
	Ci	None	N/A

Shipped from Processor(s) for Burial	Unit	3rd & 4th Quarters	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	3.64E+00	±25%
	Ci	7.15E+00	±25%
b. Dry Compressible waste, equipment, etc.	m3	2.06E+01	±25%
	Ci	5.88E-01	±25%
c. Irradiated components, control rods, etc.	m3	0.00E+00	±25%
	Ci	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	0.31%	Chromium 51	6.51%	None	N/A
Manganese-54	4.88%	Manganese-54	2.60%		
Iron-55	17.39%	Iron-55	41.95%		
Cobalt 58	1.23%	Iron 59	1.16%		
Cobalt-60	34.12%	Cobalt 58	0.78%		
Nickel-63	8.73%	Cobalt-60	29.90%		
Zinc-65	23.48%	Nickel-63	0.74%		
Zirconium 95	5.29%	Zinc-65	14.89%		
Niobium 95	4.84%	Zirconium 95	0.41%		
Antimony 124	0.15%	Niobium 95	0.36%		
Cesium 137	9.79%	Silver 110m	0.11%		
Cerium 144	0.23%	Tin-113	0.24%		
		Antimony 124	0.30%		
		Antimony 125	1.34%		
		Cesium 137	0.10%		

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

**3. Disposition of Solid Waste Shipments (3rd & 4th Quarters)**

No. of Shipments	From VY	From Processor	Mode	To Processor	To Burial
3	X		Truck	ES-GR / ES-BCD, IN	
2	X		Truck	WCS, TSD, TX	
8	X		Truck		WCS
3		X	Truck		WCS
8		X	Truck		ES Clive

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

**C. Additional Data (3rd & 4th Quarters)**

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

GR = Gallaher Road  
BCD = Bear Creek Operations  
WCS = Waste Control Specialists  
ES = Energy Solutions  
GDC = General Design Container

Completed By:

Reviewed By:

*(Signature)*  
M. Vandate / M. White / V. ...  
3-23-17

TABLE 4A

Entergy Nuclear Vermont Yankee  
 Maximum \* Quarterly and Annual Off-Site Doses from Direct Radiation  
 and Liquid and Gaseous Effluents for 2012  
 (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	4.60E-06	4.08E-06	3.96E-06	2.39E-06	1.58E-05
Footnotes	(c)	(c)	(c)	(c)	(c)
Organ Dose	4.60E-06	4.08E-06	3.96E-06	2.39E-06	1.58E-05
Footnotes	(c)	(c)	(c)	(c)	(c)
<b>Airborne Effluents</b>					
Iodines, H-3, C-14, and Particulates	2.63E-01	2.63E-01	2.64E-01	2.64E-01	1.05E+00
Footnotes	(f)	(f)	(f)	(f)	
<b>Noble Gases</b>					
Beta Air (mrad)	--	6.45E-06	--	--	6.45E-06
Footnotes	(d)	(g)	(d)	(d)	
Gamma Air (mrad)	--	3.98E-06	--	--	3.98E-06
Footnotes	(d)	(h)	(d)	(d)	
<b>Direct Radiation</b>					
	4.11	3.88	4.40	4.34	16.72 (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.
- (g) WNW, 2400 meters from the stack.
- (h) SSE, 600 meters from the stack.

TABLE 4B

Entergy Nuclear Vermont Yankee  
 Maximum \* Annual Off-Site Doses from Direct Radiation  
 and Liquid and Gaseous Effluents for 2012  
 (40CFR190)

Pathway	Total Body (mrem)	Maximum Organ (mrem)	Thyroid (mrem)
Direct External (a) (b)	16.72	16.72	16.72
Liquids (c)	1.58E-05	1.58E-05	1.58E-05
Gases (c)	2.11E-01	1.05E+00	2.12E-01
Annual Total (d)	16.9	17.8	16.9

\* 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 residential shielding credit or occupancy time fraction (i.e., occupancy is assumed to be 100%) is used. Expected direct external radiation doses would be reduced by approximately 54% with a realistic residential shielding credit and occupancy time (i.e., by using a 0.7 shielding factor from Regulatory Guide 1.109 (Reference 2) and an annual occupancy time of 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 South 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 40 CFR Part 190 are 25 mrem to the total body and any organ, and 75 mrem to the thyroid for any 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 2012 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	

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	5.45E-06	6.52E-04	5.45E-06	5.45E-06	5.45E-06	5.45E-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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA		STABILITY CLASS A																CLASS FREQUENCY (PERCENT) = .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	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	
(1)	3.85	.00	.00	.00	.00	3.85	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	7.69	
(2)	.01	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	
4-7	0	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	6	
(1)	.00	.00	3.85	.00	7.69	11.54	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	23.08	
(2)	.00	.00	.01	.00	.02	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	
8-12	1	0	0	0	1	4	3	1	0	0	0	0	0	0	0	0	0	10	
(1)	3.85	.00	.00	.00	3.85	15.38	11.54	3.85	.00	.00	.00	.00	.00	.00	.00	.00	.00	38.46	
(2)	.01	.00	.00	.00	.01	.05	.03	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.11	
13-18	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	
(1)	15.38	.00	.00	.00	.00	.00	.00	.00	3.85	.00	.00	.00	.00	.00	.00	.00	.00	19.23	
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.06	
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	11.54	.00	11.54	
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.03	
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	0	1	0	3	8	3	1	1	0	0	0	0	0	0	3	0	26	
(1)	23.08	.00	3.85	.00	11.54	30.77	11.54	3.85	3.85	.00	.00	.00	.00	.00	.00	11.54	.00	100.00	
(2)	.07	.00	.01	.00	.03	.09	.03	.01	.01	.00	.00	.00	.00	.00	.00	.03	.00	.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 5B

VERMONT YANKEE JAN 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA                      STABILITY CLASS B                      CLASS FREQUENCY (PERCENT) =    .84

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	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3
(1)	1.35	.00	.00	.00	.00	.00	1.35	.00	.00	.00	.00	.00	.00	.00	.00	1.35	.00	4.05
(2)	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.03
4-7	3	0	0	0	8	5	3	2	0	0	0	0	0	0	1	2	0	24
(1)	4.05	.00	.00	.00	10.81	6.76	4.05	2.70	.00	.00	.00	.00	.00	.00	1.35	2.70	.00	32.43
(2)	.03	.00	.00	.00	.09	.06	.03	.02	.00	.00	.00	.00	.00	.00	.01	.02	.00	.27
8-12	3	0	0	0	4	4	7	6	3	0	0	0	0	0	0	1	0	28
(1)	4.05	.00	.00	.00	5.41	5.41	9.46	8.11	4.05	.00	.00	.00	.00	.00	.00	1.35	.00	37.84
(2)	.03	.00	.00	.00	.05	.05	.08	.07	.03	.00	.00	.00	.00	.00	.00	.01	.00	.32
13-18	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	13	0	16
(1)	1.35	.00	.00	.00	.00	.00	.00	1.35	.00	.00	.00	.00	.00	.00	1.35	17.57	.00	21.62
(2)	.01	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01	.15	.00	.18
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.05	.00	4.05
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.03
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	0	0	0	12	9	11	9	3	0	0	0	0	0	2	20	0	74
(1)	10.81	.00	.00	.00	16.22	12.16	14.86	12.16	4.05	.00	.00	.00	.00	.00	2.70	27.03	.00	100.00
(2)	.09	.00	.00	.00	.14	.10	.13	.10	.03	.00	.00	.00	.00	.00	.02	.23	.00	.84

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA                      STABILITY CLASS C                      CLASS FREQUENCY (PERCENT) =    3.65

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	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	5	1	1	4	1	1	0	0	0	2	0	0	0	0	1	0	18
(1)	.63	1.56	.31	.31	1.25	.31	.31	.00	.00	.00	.63	.00	.00	.00	.00	.31	.00	5.63
(2)	.02	.06	.01	.01	.05	.01	.01	.00	.00	.00	.02	.00	.00	.00	.00	.01	.00	.21
4-7	17	2	5	11	26	29	14	13	2	1	1	3	1	2	11	20	0	158
(1)	5.31	.63	1.56	3.44	8.13	9.06	4.38	4.06	.63	.31	.31	.94	.31	.63	3.44	6.25	.00	49.38
(2)	.19	.02	.06	.13	.30	.33	.16	.15	.02	.01	.01	.03	.01	.02	.13	.23	.00	1.80
8-12	10	4	0	1	0	6	4	26	9	0	1	1	3	3	8	27	0	103
(1)	3.13	1.25	.00	.31	.00	1.88	1.25	8.13	2.81	.00	.31	.31	.94	.94	2.50	8.44	.00	32.19
(2)	.11	.05	.00	.01	.00	.07	.05	.30	.10	.00	.01	.01	.03	.03	.09	.31	.00	1.17
13-18	3	0	0	0	0	0	0	2	2	0	0	0	1	3	11	17	0	39
(1)	.94	.00	.00	.00	.00	.00	.00	.63	.63	.00	.00	.00	.31	.94	3.44	5.31	.00	12.19
(2)	.03	.00	.00	.00	.00	.00	.00	.02	.02	.00	.00	.00	.01	.03	.13	.19	.00	.44
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.63	.00	.63
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.02
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	32	11	6	13	30	36	19	41	13	1	4	4	5	8	30	67	0	320
(1)	10.00	3.44	1.88	4.06	9.38	11.25	5.94	12.81	4.06	.31	1.25	1.25	1.56	2.50	9.38	20.94	.00	100.00
(2)	.36	.13	.07	.15	.34	.41	.22	.47	.15	.01	.05	.05	.06	.09	.34	.76	.00	3.65

(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 5D

VERMONT YANKEE JAN 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA

STABILITY CLASS D

CLASS FREQUENCY (PERCENT) = 50.72

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	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3
(1)	.02	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.07
(2)	.01	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.03
C-3	88	55	58	60	71	51	77	72	47	35	29	26	36	48	79	93	0	925
(1)	1.98	1.24	1.30	1.35	1.60	1.15	1.73	1.62	1.06	.79	.65	.58	.81	1.08	1.77	2.09	.00	20.78
(2)	1.00	.63	.66	.68	.81	.58	.88	.82	.54	.40	.33	.30	.41	.55	.90	1.06	.00	10.54
4-7	162	42	24	31	61	114	238	309	123	41	21	46	82	62	195	315	0	1866
(1)	3.64	.94	.54	.70	1.37	2.56	5.35	6.94	2.76	.92	.47	1.03	1.84	1.39	4.38	7.08	.00	41.92
(2)	1.85	.48	.27	.35	.70	1.30	2.71	3.52	1.40	.47	.24	.52	.93	.71	2.22	3.59	.00	21.26
8-12	110	10	1	2	2	13	32	139	107	19	17	28	155	193	156	286	0	1270
(1)	2.47	.22	.02	.04	.04	.29	.72	3.12	2.40	.43	.38	.63	3.48	4.34	3.50	6.43	.00	28.53
(2)	1.25	.11	.01	.02	.02	.15	.36	1.58	1.22	.22	.19	.32	1.77	2.20	1.78	3.26	.00	14.47
13-18	32	2	1	0	0	0	2	13	28	1	2	1	40	88	57	104	0	371
(1)	.72	.04	.02	.00	.00	.00	.04	.29	.63	.02	.04	.02	.90	1.98	1.28	2.34	.00	8.34
(2)	.36	.02	.01	.00	.00	.00	.02	.15	.32	.01	.02	.01	.46	1.00	.65	1.19	.00	4.23
19-24	1	0	0	0	0	0	0	0	0	0	0	0	0	8	1	6	0	16
(1)	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.18	.02	.13	.00	.36
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.01	.07	.00	.18
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	394	109	84	93	134	179	349	533	305	96	69	101	314	399	488	804	0	4451
(1)	8.85	2.45	1.89	2.09	3.01	4.02	7.84	11.97	6.85	2.16	1.55	2.27	7.05	8.96	10.96	18.06	.00	100.00
(2)	4.49	1.24	.96	1.06	1.53	2.04	3.98	6.07	3.48	1.09	.79	1.15	3.58	4.55	5.56	9.16	.00	50.72

(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 5E

VERMONT YANKEE JAN 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA                      STABILITY CLASS E                      CLASS FREQUENCY (PERCENT) = 29.34

## 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	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4
(1)	.00	.04	.04	.04	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.16
(2)	.00	.01	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
C-3	49	20	14	14	15	33	48	73	102	154	198	193	202	156	147	108	0	1526
(1)	1.90	.78	.54	.54	.58	1.28	1.86	2.83	3.96	5.98	7.69	7.50	7.84	6.06	5.71	4.19	.00	59.26
(2)	.56	.23	.16	.16	.17	.38	.55	.83	1.16	1.75	2.26	2.20	2.30	1.78	1.68	1.23	.00	17.39
4-7	24	5	3	0	6	12	61	119	81	30	22	47	77	82	136	148	0	853
(1)	.93	.19	.12	.00	.23	.47	2.37	4.62	3.15	1.17	.85	1.83	2.99	3.18	5.28	5.75	.00	33.13
(2)	.27	.06	.03	.00	.07	.14	.70	1.36	.92	.34	.25	.54	.88	.93	1.55	1.69	.00	9.72
8-12	2	2	1	0	0	0	2	11	29	5	3	1	23	29	30	27	0	165
(1)	.08	.08	.04	.00	.00	.00	.08	.43	1.13	.19	.12	.04	.89	1.13	1.17	1.05	.00	6.41
(2)	.02	.02	.01	.00	.00	.00	.02	.13	.33	.06	.03	.01	.26	.33	.34	.31	.00	1.88
13-18	2	0	1	0	0	0	0	1	7	2	0	0	2	1	6	5	0	27
(1)	.08	.00	.04	.00	.00	.00	.00	.04	.27	.08	.00	.00	.08	.04	.23	.19	.00	1.05
(2)	.02	.00	.01	.00	.00	.00	.00	.01	.08	.02	.00	.00	.02	.01	.07	.06	.00	.31
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	77	28	20	15	21	46	111	204	219	191	223	241	304	268	319	288	0	2575
(1)	2.99	1.09	.78	.58	.82	1.79	4.31	7.92	8.50	7.42	8.66	9.36	11.81	10.41	12.39	11.18	.00	100.00
(2)	.88	.32	.23	.17	.24	.52	1.26	2.32	2.50	2.18	2.54	2.75	3.46	3.05	3.64	3.28	.00	29.34

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA

STABILITY CLASS F

CLASS FREQUENCY (PERCENT) = 12.57

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	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
(1)	.09	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.18
(2)	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
C-3	16	4	3	3	3	4	14	22	52	102	239	226	156	71	38	19	0	972
(1)	1.45	.36	.27	.27	.27	.36	1.27	1.99	4.71	9.25	21.67	20.49	14.14	6.44	3.45	1.72	.00	88.12
(2)	.18	.05	.03	.03	.03	.05	.16	.25	.59	1.16	2.72	2.58	1.78	.81	.43	.22	.00	11.08
4-7	3	0	0	1	2	0	1	4	23	13	11	6	15	13	20	16	0	128
(1)	.27	.00	.00	.09	.18	.00	.09	.36	2.09	1.18	1.00	.54	1.36	1.18	1.81	1.45	.00	11.60
(2)	.03	.00	.00	.01	.02	.00	.01	.05	.26	.15	.13	.07	.17	.15	.23	.18	.00	1.46
8-12	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	.09	.00	.09
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
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	20	4	3	4	5	4	16	26	75	115	250	232	171	84	58	36	0	1103
(1)	1.81	.36	.27	.36	.45	.36	1.45	2.36	6.80	10.43	22.67	21.03	15.50	7.62	5.26	3.26	.00	100.00
(2)	.23	.05	.03	.05	.06	.05	.18	.30	.85	1.31	2.85	2.64	1.95	.96	.66	.41	.00	12.57

(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 5G

VERMONT YANKEE JAN 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA                      STABILITY CLASS G                      CLASS FREQUENCY (PERCENT) = 2.58

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	6	3	2	1	3	1	5	10	22	25	22	40	22	18	14	6	0	200
(1)	2.65	1.33	.88	.44	1.33	.44	2.21	4.42	9.73	11.06	9.73	17.70	9.73	7.96	6.19	2.65	.00	88.50
(2)	.07	.03	.02	.01	.03	.01	.06	.11	.25	.28	.25	.46	.25	.21	.16	.07	.00	2.28
4-7	1	0	0	0	0	0	0	2	2	3	4	2	1	1	2	8	0	26
(1)	.44	.00	.00	.00	.00	.00	.00	.88	.88	1.33	1.77	.88	.44	.44	.88	3.54	.00	11.50
(2)	.01	.00	.00	.00	.00	.00	.00	.02	.02	.03	.05	.02	.01	.01	.02	.09	.00	.30
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	7	3	2	1	3	1	5	12	24	28	26	42	23	19	16	14	0	226
(1)	3.10	1.33	.88	.44	1.33	.44	2.21	5.31	10.62	12.39	11.50	18.58	10.18	8.41	7.08	6.19	.00	100.00
(2)	.08	.03	.02	.01	.03	.01	.06	.14	.27	.32	.30	.48	.26	.22	.18	.16	.00	2.58

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA

STABILITY CLASS ALL

CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED	WIND DIRECTION FROM																	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	
	MPH																	
CALM	2	1	1	1	0	2	1	0	0	0	0	0	1	0	0	0	0	9
(1)	.02	.01	.01	.01	.00	.02	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.10
(2)	.02	.01	.01	.01	.00	.02	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.10
C-3	163	87	78	79	96	91	146	177	223	316	490	485	416	293	278	228	0	3646
(1)	1.86	.99	.89	.90	1.09	1.04	1.66	2.02	2.54	3.60	5.58	5.53	4.74	3.34	3.17	2.60	.00	41.55
(2)	1.86	.99	.89	.90	1.09	1.04	1.66	2.02	2.54	3.60	5.58	5.53	4.74	3.34	3.17	2.60	.00	41.55
4-7	210	49	33	43	105	163	317	449	231	88	59	104	176	160	365	509	0	3061
(1)	2.39	.56	.38	.49	1.20	1.86	3.61	5.12	2.63	1.00	.67	1.19	2.01	1.82	4.16	5.80	.00	34.88
(2)	2.39	.56	.38	.49	1.20	1.86	3.61	5.12	2.63	1.00	.67	1.19	2.01	1.82	4.16	5.80	.00	34.88
8-12	126	16	2	3	7	27	48	183	148	24	21	30	181	225	194	342	0	1577
(1)	1.44	.18	.02	.03	.08	.31	.55	2.09	1.69	.27	.24	.34	2.06	2.56	2.21	3.90	.00	17.97
(2)	1.44	.18	.02	.03	.08	.31	.55	2.09	1.69	.27	.24	.34	2.06	2.56	2.21	3.90	.00	17.97
13-18	42	2	2	0	0	0	2	17	38	3	2	1	43	92	75	139	0	458
(1)	.48	.02	.02	.00	.00	.00	.02	.19	.43	.03	.02	.01	.49	1.05	.85	1.58	.00	5.22
(2)	.48	.02	.02	.00	.00	.00	.02	.19	.43	.03	.02	.01	.49	1.05	.85	1.58	.00	5.22
19-24	1	0	0	0	0	0	0	0	0	0	0	0	0	8	1	14	0	24
(1)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.01	.16	.00	.27
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.01	.16	.00	.27
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	544	155	116	126	208	283	514	826	640	431	572	620	817	778	913	1232	0	8775
(1)	6.20	1.77	1.32	1.44	2.37	3.23	5.86	9.41	7.29	4.91	6.52	7.07	9.31	8.87	10.40	14.04	.00	100.00
(2)	6.20	1.77	1.32	1.44	2.37	3.23	5.86	9.41	7.29	4.91	6.52	7.07	9.31	8.87	10.40	14.04	.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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA                      STABILITY CLASS A                      CLASS FREQUENCY (PERCENT) = .08

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	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4
(1)	.00	42.86	.00	.00	14.29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	57.14
(2)	.00	.03	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
4-7	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2
(1)	.00	.00	.00	.00	.00	14.29	.00	.00	.00	.00	.00	.00	.00	14.29	.00	.00	.00	28.57
(2)	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.02
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	1	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	14.29	.00	14.29
(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	0	3	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	7
(1)	.00	42.86	.00	.00	14.29	14.29	.00	.00	.00	.00	.00	.00	.00	14.29	.00	14.29	.00	100.00
(2)	.00	.03	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.08

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA                      STABILITY CLASS B                      CLASS FREQUENCY (PERCENT) = .17

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	3	0	0	0	0	0	0	0	0	0	0	3
(1)	.00	.00	.00	.00	.00	.00	20.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	20.00
(2)	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
4-7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	4
(1)	6.67	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	20.00	.00	26.67
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.05
8-12	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
(1)	.00	.00	.00	.00	6.67	6.67	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	13.33
(2)	.00	.00	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
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	6.67	.00	6.67
(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	2	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	13.33	.00	13.33
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.02
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	20.00	.00	20.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.03
ALL SPEEDS	1	0	0	0	1	1	3	0	0	0	0	0	0	0	0	9	0	15
(1)	6.67	.00	.00	.00	6.67	6.67	20.00	.00	.00	.00	.00	.00	.00	.00	.00	60.00	.00	100.00
(2)	.01	.00	.00	.00	.01	.01	.03	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.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 6C

VERMONT YANKEE JAN 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA

STABILITY CLASS C

CLASS FREQUENCY (PERCENT) = 1.32

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	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	3
(1)	.86	.00	.00	.00	.86	.00	.00	.86	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.59
(2)	.01	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
4-7	5	0	0	0	1	3	0	0	0	0	0	0	0	0	0	2	0	11
(1)	4.31	.00	.00	.00	.86	2.59	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.72	.00	9.48
(2)	.06	.00	.00	.00	.01	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.13
8-12	3	1	0	0	1	8	1	8	0	0	0	0	1	2	2	9	0	36
(1)	2.59	.86	.00	.00	.86	6.90	.86	6.90	.00	.00	.00	.00	.86	1.72	1.72	7.76	.00	31.03
(2)	.03	.01	.00	.00	.01	.09	.01	.09	.00	.00	.00	.00	.01	.02	.02	.10	.00	.41
13-18	3	0	0	0	0	0	1	3	4	0	0	1	0	0	6	18	0	36
(1)	2.59	.00	.00	.00	.00	.00	.86	2.59	3.45	.00	.00	.86	.00	.00	5.17	15.52	.00	31.03
(2)	.03	.00	.00	.00	.00	.00	.01	.03	.05	.00	.00	.01	.00	.00	.07	.21	.00	.41
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	19	0	24
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.86	3.45	16.38	.00	20.69
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.05	.22	.00	.27
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	6
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.86	4.31	.00	5.17
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.06	.00	.07
ALL SPEEDS	12	1	0	0	3	11	2	12	4	0	0	1	1	3	13	53	0	116
(1)	10.34	.86	.00	.00	2.59	9.48	1.72	10.34	3.45	.00	.00	.86	.86	2.59	11.21	45.69	.00	100.00
(2)	.14	.01	.00	.00	.03	.13	.02	.14	.05	.00	.00	.01	.01	.03	.15	.60	.00	1.32

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA

STABILITY CLASS D

CLASS FREQUENCY (PERCENT) = 52.79

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	1	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.02
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01
C-3	51	50	42	43	47	69	74	53	18	15	7	12	17	12	34	79	0	623
(1)	1.10	1.08	.91	.93	1.01	1.49	1.60	1.14	.39	.32	.15	.26	.37	.26	.73	1.71	.00	13.45
(2)	.58	.57	.48	.49	.54	.79	.84	.60	.21	.17	.08	.14	.19	.14	.39	.90	.00	7.10
4-7	77	23	20	30	65	117	207	178	94	23	18	9	13	19	63	251	0	1207
(1)	1.66	.50	.43	.65	1.40	2.53	4.47	3.84	2.03	.50	.39	.19	.28	.41	1.36	5.42	.00	26.06
(2)	.88	.26	.23	.34	.74	1.33	2.36	2.03	1.07	.26	.21	.10	.15	.22	.72	2.86	.00	13.76
8-12	113	22	12	2	5	43	89	262	223	40	31	46	128	116	94	363	0	1589
(1)	2.44	.47	.26	.04	.11	.93	1.92	5.66	4.81	.86	.67	.99	2.76	2.50	2.03	7.84	.00	34.30
(2)	1.29	.25	.14	.02	.06	.49	1.01	2.99	2.54	.46	.35	.52	1.46	1.32	1.07	4.14	.00	18.11
13-18	69	10	1	1	1	5	14	24	110	12	10	25	120	166	99	232	0	899
(1)	1.49	.22	.02	.02	.02	.11	.30	.52	2.37	.26	.22	.54	2.59	3.58	2.14	5.01	.00	19.41
(2)	.79	.11	.01	.01	.01	.06	.16	.27	1.25	.14	.11	.28	1.37	1.89	1.13	2.64	.00	10.25
19-24	25	1	1	0	2	0	5	7	26	1	0	3	28	49	32	109	0	289
(1)	.54	.02	.02	.00	.04	.00	.11	.15	.56	.02	.00	.06	.60	1.06	.69	2.35	.00	6.24
(2)	.28	.01	.01	.00	.02	.00	.06	.08	.30	.01	.00	.03	.32	.56	.36	1.24	.00	3.29
GT 24	2	0	2	0	0	0	0	2	0	0	0	0	1	3	1	13	0	24
(1)	.04	.00	.04	.00	.00	.00	.00	.04	.00	.00	.00	.00	.02	.06	.02	.28	.00	.52
(2)	.02	.00	.02	.00	.00	.00	.00	.02	.00	.00	.00	.00	.01	.03	.01	.15	.00	.27
ALL SPEEDS	337	106	78	76	120	234	389	526	471	91	67	95	307	365	323	1047	0	4632
(1)	7.28	2.29	1.68	1.64	2.59	5.05	8.40	11.36	10.17	1.96	1.45	2.05	6.63	7.88	6.97	22.60	.00	100.00
(2)	3.84	1.21	.89	.87	1.37	2.67	4.43	5.99	5.37	1.04	.76	1.08	3.50	4.16	3.68	11.93	.00	52.79

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA

STABILITY CLASS E

CLASS FREQUENCY (PERCENT) = 33.77

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	101	71	56	68	98	120	111	57	32	22	14	16	14	12	40	72	0	904
(1)	3.41	2.40	1.89	2.29	3.31	4.05	3.75	1.92	1.08	.74	.47	.54	.47	.40	1.35	2.43	.00	30.51
(2)	1.15	.81	.64	.78	1.12	1.37	1.27	.65	.36	.25	.16	.18	.16	.14	.46	.82	.00	10.30
4-7	98	17	13	8	8	40	140	161	67	28	26	25	34	33	62	372	0	1132
(1)	3.31	.57	.44	.27	.27	1.35	4.72	5.43	2.26	.94	.88	.84	1.15	1.11	2.09	12.55	.00	38.20
(2)	1.12	.19	.15	.09	.09	.46	1.60	1.83	.76	.32	.30	.28	.39	.38	.71	4.24	.00	12.90
8-12	54	5	0	0	0	5	31	92	63	34	15	24	55	73	48	196	0	695
(1)	1.82	.17	.00	.00	.00	.17	1.05	3.10	2.13	1.15	.51	.81	1.86	2.46	1.62	6.61	.00	23.46
(2)	.62	.06	.00	.00	.00	.06	.35	1.05	.72	.39	.17	.27	.63	.83	.55	2.23	.00	7.92
13-18	12	4	0	0	0	1	1	2	42	10	2	3	21	23	21	59	0	201
(1)	.40	.13	.00	.00	.00	.03	.03	.07	1.42	.34	.07	.10	.71	.78	.71	1.99	.00	6.78
(2)	.14	.05	.00	.00	.00	.01	.01	.02	.48	.11	.02	.03	.24	.26	.24	.67	.00	2.29
19-24	3	0	0	2	0	0	1	1	9	3	0	0	0	0	3	6	0	28
(1)	.10	.00	.00	.07	.00	.00	.03	.03	.30	.10	.00	.00	.00	.00	.10	.20	.00	.94
(2)	.03	.00	.00	.02	.00	.00	.01	.01	.10	.03	.00	.00	.00	.00	.03	.07	.00	.32
GT 24	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
(1)	.00	.00	.03	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10
(2)	.00	.00	.01	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
ALL SPEEDS	268	97	70	78	106	166	284	315	213	97	57	68	124	141	174	705	0	2963
(1)	9.04	3.27	2.36	2.63	3.58	5.60	9.58	10.63	7.19	3.27	1.92	2.29	4.18	4.76	5.87	23.79	.00	100.00
(2)	3.05	1.11	.80	.89	1.21	1.89	3.24	3.59	2.43	1.11	.65	.78	1.41	1.61	1.98	8.04	.00	33.77

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA

STABILITY CLASS F

CLASS FREQUENCY (PERCENT) = 10.54

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	46	39	25	24	38	33	42	29	15	12	7	11	5	12	24	29	0	391
(1)	4.97	4.22	2.70	2.59	4.11	3.57	4.54	3.14	1.62	1.30	.76	1.19	.54	1.30	2.59	3.14	.00	42.27
(2)	.52	.44	.28	.27	.43	.38	.48	.33	.17	.14	.08	.13	.06	.14	.27	.33	.00	4.46
4-7	33	5	1	1	13	22	57	75	20	12	10	19	15	22	24	90	0	419
(1)	3.57	.54	.11	.11	1.41	2.38	6.16	8.11	2.16	1.30	1.08	2.05	1.62	2.38	2.59	9.73	.00	45.30
(2)	.38	.06	.01	.01	.15	.25	.65	.85	.23	.14	.11	.22	.17	.25	.27	1.03	.00	4.78
8-12	3	0	0	0	0	1	13	14	7	6	4	2	11	13	4	34	0	112
(1)	.32	.00	.00	.00	.00	.11	1.41	1.51	.76	.65	.43	.22	1.19	1.41	.43	3.68	.00	12.11
(2)	.03	.00	.00	.00	.00	.01	.15	.16	.08	.07	.05	.02	.13	.15	.05	.39	.00	1.28
13-18	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	3
(1)	.11	.00	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.11	.00	.32
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.01	.00	.03
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	83	44	26	25	51	56	112	118	42	31	21	32	31	47	52	154	0	925
(1)	8.97	4.76	2.81	2.70	5.51	6.05	12.11	12.76	4.54	3.35	2.27	3.46	3.35	5.08	5.62	16.65	.00	100.00
(2)	.95	.50	.30	.28	.58	.64	1.28	1.34	.48	.35	.24	.36	.35	.54	.59	1.76	.00	10.54

(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 12 - DEC 12 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA                      STABILITY CLASS G                      CLASS FREQUENCY (PERCENT) = 1.32

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	2	1	1	0	1	2	4	0	3	1	2	2	1	1	1	2	0	24
(1)	1.72	.86	.86	.00	.86	1.72	3.45	.00	2.59	.86	1.72	1.72	.86	.86	.86	1.72	.00	20.69
(2)	.02	.01	.01	.00	.01	.02	.05	.00	.03	.01	.02	.02	.01	.01	.01	.02	.00	.27
4-7	5	1	1	0	0	1	5	7	7	1	7	3	6	6	0	9	0	59
(1)	4.31	.86	.86	.00	.00	.86	4.31	6.03	6.03	.86	6.03	2.59	5.17	5.17	.00	7.76	.00	50.86
(2)	.06	.01	.01	.00	.00	.01	.06	.08	.08	.01	.08	.03	.07	.07	.00	.10	.00	.67
8-12	0	0	0	0	0	0	0	2	2	1	1	1	7	8	3	6	0	31
(1)	.00	.00	.00	.00	.00	.00	.00	1.72	1.72	.86	.86	.86	6.03	6.90	2.59	5.17	.00	26.72
(2)	.00	.00	.00	.00	.00	.00	.00	.02	.02	.01	.01	.01	.08	.09	.03	.07	.00	.35
13-18	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.86	.00	.00	.00	.00	.86	.00	.00	.00	1.72
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.01	.00	.00	.00	.02
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	7	2	2	0	1	3	9	9	13	3	10	6	14	16	4	17	0	116
(1)	6.03	1.72	1.72	.00	.86	2.59	7.76	7.76	11.21	2.59	8.62	5.17	12.07	13.79	3.45	14.66	.00	100.00
(2)	.08	.02	.02	.00	.01	.03	.10	.10	.15	.03	.11	.07	.16	.18	.05	.19	.00	1.32

(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 12 - DEC 12 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	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	1	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01
C-3	201	164	124	135	186	224	234	140	68	50	30	41	37	37	99	182	0	1952
(1)	2.29	1.87	1.41	1.54	2.12	2.55	2.67	1.60	.78	.57	.34	.47	.42	.42	1.13	2.07	.00	22.25
(2)	2.29	1.87	1.41	1.54	2.12	2.55	2.67	1.60	.78	.57	.34	.47	.42	.42	1.13	2.07	.00	22.25
4-7	219	46	35	39	87	184	409	421	188	64	61	56	68	81	149	727	0	2834
(1)	2.50	.52	.40	.44	.99	2.10	4.66	4.80	2.14	.73	.70	.64	.78	.92	1.70	8.29	.00	32.30
(2)	2.50	.52	.40	.44	.99	2.10	4.66	4.80	2.14	.73	.70	.64	.78	.92	1.70	8.29	.00	32.30
8-12	173	28	12	2	7	58	134	378	295	81	51	73	202	212	151	608	0	2465
(1)	1.97	.32	.14	.02	.08	.66	1.53	4.31	3.36	.92	.58	.83	2.30	2.42	1.72	6.93	.00	28.09
(2)	1.97	.32	.14	.02	.08	.66	1.53	4.31	3.36	.92	.58	.83	2.30	2.42	1.72	6.93	.00	28.09
13-18	85	14	1	1	1	6	16	29	157	23	12	29	141	190	126	312	0	1143
(1)	.97	.16	.01	.01	.01	.07	.18	.33	1.79	.26	.14	.33	1.61	2.17	1.44	3.56	.00	13.03
(2)	.97	.16	.01	.01	.01	.07	.18	.33	1.79	.26	.14	.33	1.61	2.17	1.44	3.56	.00	13.03
19-24	28	1	1	2	2	0	6	8	35	4	0	3	28	50	39	136	0	343
(1)	.32	.01	.01	.02	.02	.00	.07	.09	.40	.05	.00	.03	.32	.57	.44	1.55	.00	3.91
(2)	.32	.01	.01	.02	.02	.00	.07	.09	.40	.05	.00	.03	.32	.57	.44	1.55	.00	3.91
GT 24	2	0	3	0	0	0	0	4	0	0	0	0	1	3	2	21	0	36
(1)	.02	.00	.03	.00	.00	.00	.00	.05	.00	.00	.00	.00	.01	.03	.02	.24	.00	.41
(2)	.02	.00	.03	.00	.00	.00	.00	.05	.00	.00	.00	.00	.01	.03	.02	.24	.00	.41
ALL SPEEDS	708	253	176	179	283	472	799	980	743	222	155	202	477	573	566	1986	0	8774
(1)	8.07	2.88	2.01	2.04	3.23	5.38	9.11	11.17	8.47	2.53	1.77	2.30	5.44	6.53	6.45	22.64	.00	100.00
(2)	8.07	2.88	2.01	2.04	3.23	5.38	9.11	11.17	8.47	2.53	1.77	2.30	5.44	6.53	6.45	22.64	.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)



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 Greater Than 8 Days</u>	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 2012 there was a continuous release due to the residual radioactivity in groundwater from 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 2012, the total Tritium radioactivity conservatively estimated to be released to the Connecticut River is 0.106 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

<u>Requirement</u>	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.
<u>Response:</u>	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 2012. 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: No revisions were made to the ODCM during the reporting period.

## 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 Release 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 disposal activities on the Vermont Yankee site.

**Response:** There was one on-site disposal spreading of 8,000 gallons of septic waste during August of 2012, and no spreading activities for cooling tower silt or sand/soil type materials. There was no radioactivity detected in this septic waste. The total radioactivity spread on the 1.9 acres (southern) on-site disposal field from previous years was as follows:

<u>Radionuclide</u>	Activity Spread in 2012	Activity from All Past Disposals
	(Ci)	Decayed to 1/1/2012 (Ci)
Mn-54	0	2.53E-07
Co-60	0	2.01E-05
Zn-65	0	1.81E-07
Cs-134	0	2.40E-09
Cs-137	0	8.18E-05

The maximum organ dose from all past spreading operations totaled 1.24E-01 mrem/year. This calculated value is 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 2.13E-01 mrem/year versus a 5 mrem/year dose limit. The "intruder dose" period begins on the date that the plant operating license expires, March 21, 2032.