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BVY 15-037

May 12, 2015

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

SUBJECT: 2014 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 2014 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 minor changes made to the ODCM during 2014 as noted in Appendix H of the subject report.

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

Should you have any questions or require additional information concerning this submittal, please contact me at (802) 451-3374.

Sincerely,

[CCC/JTM]

Enclosure: Radioactive Effluent Release Report for 2014

cc listing (next page)

IE48
NRR

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RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2014 INCLUDING ANNUAL RADIOLOGICAL IMPACT ON MAN

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

Prepared by: Jo-Ann Pelczar / 5/11/15
Jo-Ann Pelczar, Advisory Scientist, AREVA, Inc. Date

Preparation coordinated by: / 5/11/2015
Kevan Whippie, Chemistry Supervisor Date

Reviewed by: / 5/11/15
Mike Morgan, RP Supervisor Date

Approved for Distribution: / 5/11/15
Mike Pletcher, RP/Chemistry Manager Date

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Radiological Effluent Release Report for 2014

[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 2014 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 2014. Radioactive effluents reported in Tables 1 and 2 were used to determine the dose to the maximum exposed individual for 2014.

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 2014 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 2014 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.

χ/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, χ/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 routine 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 2014 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 2014, 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 2014 was generated and reported in Table 2A.

For the projected ground water flow into the Connecticut River in 2014, 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 (3,109 cfs in September 2014) for dilution. All irrigation exposure pathways for the consumption of food products grown with irrigated water occur below Vernon Dam and assume the lowest 2014 quarterly average growing season river flow value (6,157 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 (6,157 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 2014, there were no noble gases detected in effluents released from the plant stack.

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 2014, 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.

One unplanned gaseous release of tritium was recorded during the second quarter. On April 17, 2014, during a maintenance activity in the drain pit of the Advanced Offgas (AOG) system, there was a brief 4-hour ground level gaseous release of 2.80E-03 Ci of H-3. The resultant off-site dose from this release was minimal with respect to the routine normal effluent gaseous releases.

Exposure pathways that could exist as a result of the planned (routine) 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 2014.

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 2014, 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 2014, based on the combined dose from this spreading and all past spreadings.

3.6 On-Site Recreational Activities

During 2014, 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 35, Entergy Nuclear Vermont Yankee, LLC , dated October 9, 2014.

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 l, 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 lA

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents - Summation of All Releases

		Unit	Quarter 1	Quarter 2	Est. Total Error, %
A.	Fission and Activation Gases				
1.	Total release	Ci	ND	ND	±2.30E+01
2.	Average release rate for period	µCi/sec	ND	ND	N/A
3.	Percent of ODCM limit (1)	%	ND	ND	N/A
B.	Iodines				
1.	Total Iodine	Ci	ND	8.14E-05	±1.80E+01
2.	Average release rate for period	µCi/sec	ND	1.02E-05	N/A
3.	Percent of ODCM limit (3)	%	(3)	(3)	N/A
C.	Particulates				
1.	Particulates with T-1/2>8 days	Ci	ND	3.58E-06	±1.80E+01
2.	Average release rate for period	µCi/sec	ND	4.50E-07	N/A
3.	Percent of ODCM limit (3)	%	(3)	(3)	N/A
4.	Gross alpha radioactivity	Ci	ND	ND	N/A
D.	Tritium (4)				
1.	Total release	Ci	5.62E-01	7.34E-01	±1.80E+01
2.	Average release rate for period	µCi/sec	7.07E-02	9.20E-02	N/A
3.	Percent of ODCM limit (3)	%	(3)	(3)	N/A
E.	Carbon-14				
1.	Total release	Ci	1.89E+00	1.91E+00	(5)
2.	Percent of ODCM limit (2)	%	7.32E+00	7.44E+00	N/A

ND = Not Detected

(1) ODCM Control 3.3.2. for the most limiting of beta air or gamma air dose. Percentage of ODCM limit calculated using Method I dose results.

(2) ODCM Control 3.3.3. for dose from 1-131, 1-133, Tritium, Carbon-14 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) 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 lA
(Continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents - Summation of All Releases

	Unit	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and Activation Gases				
1. Total release	Ci	ND	ND	±2.30E+01
2. Average release rate for period	µCi/sec	ND	ND	N/A
3. Percent of ODCM limit (1)	%	ND	ND	N/A
B. Iodines				
1. Total Iodine	Ci	1.01E-04	ND	±1.80E+01
2. Average release rate for period	µCi/sec	1.28E-05	ND	N/A
3. Percent of ODCM limit (3)	%	(3)	(3)	N/A
C. Particulates				
1. Particulates with T-1/2>8 days	Ci	ND	ND	±1.80E+01
2. Average release rate for period	µCi/sec	ND	ND	N/A
3. Percent of ODCM limit (3)	%	(3)	(3)	N/A
4. Gross alpha radioactivity	Ci	ND	ND	N/A
D. Tritium (4)				
1. Total release	Ci	9.68E-01	1.89E+00	±1.80E+01
2. Average release rate for period	µCi/sec	1.22E-01	2.37E-01	N/A
3. Percent of ODCM limit (3)	%	(3)	(3)	N/A
E. Carbon-14				
1. Total release	Ci	1.95E+00	1.62E+00	(5)
2. Percent of ODCM limit (2)	%	7.57E+00	6.29E+00	N/A

ND = Not Detected

(1) ODCM Control 3.3.2. for the most limiting of beta air or gamma air dose. Percentage of ODCM limit calculated using Method I dose results.

(2) ODCM Control 3.3.3. for dose from 1-131, 1-133, Tritium, Carbon-14 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) 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 lB

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents - Elevated Releases

		Continuous Mode		Batch Mode (1)	
		Quarter		Quarter	
Nuclides Released	**Units**	1	2	1	2
1. Fission Gases					
Argon-41	Ci	ND	ND		
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-133m	Ci	ND	ND		
Xenon-135	Ci	ND	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Unidentified	Ci	ND	ND		
Total for Period	**Ci**	**ND**	**ND**	(1)	(1)
2. Iodines					
Iodine-131	Ci	ND	5.10E-06		
Iodine-133	Ci	ND	7.63E-05		
Iodine-135	Ci	ND	ND		
Total for Period	**Ci**	**ND**	**8.14E-05**	(1)	(1)
3. Particulates					
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-58	Ci	ND	3.58E-06		
Cobalt-60	Ci	ND	ND		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
Total for Period	**Ci**	**ND**	**3.58E-06**	(1)	(1)

ND Not Detected at the plant stack
(1) There were no batch mode gaseous releases for this reporting period.

TABLE lB
(Continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents - Elevated Releases

		Continuous Mode		Batch Mode (1)	
		Quarter		Quarter	
Nuclides Released	**Units**	3	4	3	4
1. Fission Gases					
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		
Total for Period	**Ci**	**ND**	**ND**	(1)	(1)
2. Iodines					
Iodine-131	Ci	ND	ND		
Iodine-133	Ci	1.01E-04	ND		
Iodine-135	Ci	ND	ND		
Total for Period	**Ci**	**1.01E-04**	**ND**	(1)	(1)
3. Particulates					
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	ND		
Cerium-141	Ci	ND	ND		
Cerium-144	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
Total for Period	**Ci**	**ND**	**ND**	(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 2014
Gaseous Effluents – (Routine) Ground Level Releases [2]

		Continuous Mode		Batch Mode	
		Quarter		Quarter	
Nuclides Released	**Units**	1 (1)	2 (1)	1 (1)	2 (1)
1. Fission Gases					
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				
Total for Period	**Ci**				
2. Iodines					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-I 35	Ci				
Total for Period	**Ci**				
3. Particulates					
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				
Total for Period	**Ci**				

(1) There were no routine ground level gaseous releases for this reporting period.
(2) No radioactively contaminated used oil was burned during 2014.

TABLE lC
(Continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents - (Routine) Ground Level Releases[2]

		Continuous Mode		Batch Mode	
		Quarter		Quarter	
Nuclides Released	**Units**	3 (1)	4 (1)	3 (1)	4 (1)
1. Fission Gases					
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				
Total for Period	**Ci**				
2. Iodines					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-135	Ci				
Total for Period	**Ci**				
3. Particulates					
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				
Total for Period	**Ci**				

(1) There were no ground level gaseous releases for this reporting period.
(2) No radioactively contaminated used oil was burned during 2014.

TABLE 1D

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Gaseous Effluents –Non-routine Releases

		Quarter		Quarter	
Nuclides Released	Units	1(1)	2(2)	3(1)	4(1)
1. Fission Gases					
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				
Total for Period	**Ci**				
2. Iodines					
Iodine-131	Ci				
Iodine-133	Ci				
Iodine-I 35	Ci				
Total for Period	**Ci**				
3. Particulates					
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	Cl				
Total for Period	**Ci**				

(1) There were no non-routine ground level gaseous releases for this reporting period.
(2) On 4/17/2014, there was an unplanned ground-level release of 2.80E-03 Ci of H-3 from the AOG drain pit.

TABLE 2A

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Liquid Effluents - Summation of All Releases

	Units	Quarter 1	Quarter 2	Est. Total Error, %
A. Fission and Activation Products				
1. Total Release (not including tritium, gases, alpha)	Ci	ND	ND	N/A
2. Average Diluted Concentration During Period	µCi/ml	ND	ND	
3. Percent of Applicable Limit (1)	%	ND	ND	
B. Tritium				
1. Total Release	Ci	1.26E-02	1.18E-02	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	2.46E-06	2.13E-06	
3. Percent of Applicable Limit (1)	%	8.87E-05	8.33E-05	
C. Dissolved and Entrained Gases				
1. Total Release	Ci	ND	ND	N/A
2. Average Diluted Concentration During Period	µCi/ml	ND	ND	
3. Percent of Applicable Limit	%	ND	ND	
D. Gross Alpha Radioactivity				
1. Total Release	Ci	ND	ND	N/A
E. Volume of Waste Release (prior to dilution)	Liters	(2)	(2)	N/A
F. Volume of Dilution Water Used During Period	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 2.46E-03%, 0.21%, 0.19%, and 0.18% 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 2014.

(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 2014. An Estimated Total Error is not applicable.

TABLE 2A
(Continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Liquid Effluents - Summation of All Releases

	Units	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and Activation Products				
1. Total Release (not including tritium, gases, alpha)	Ci	ND	ND	N/A
2. Average Diluted Concentration During Period	µCi/ml	ND	ND	
3. Percent of Applicable Limit (1)	%	ND	ND	
B. Tritium				
1. Total Release	Ci	1.10E-02	9.88E-03	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	1.90E-06	1.77E-06	
3. Percent of Applicable Limit (1)	%	7.73E-05	6.93E-05	
C. Dissolved and Entrained Gases				
1. Total Release	Ci	ND	ND	N/A
2. Average Diluted Concentration During Period	µCi/ml	ND	ND	
3. Percent of Applicable Limit	%	ND	ND	
D. Gross Alpha Radioactivity				
1. Total Release	Ci	ND	ND	N/A
E. Volume of Waste Release (prior to dilution)	Liters	(2)	(2)	N/A
F. Volume of Dilution Water Used During Period	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 2.46E-03%, 0.21%, 0.19%, and 0.18% 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 2014.

(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 2014. An Estimated Total Error is not applicable.

TABLE 2B

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Liquid Effluents - Routine Releases

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

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

TABLE 2B
(Continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
Liquid Effluents - Routine Releases

		Continuous Mode		Batch Mode	
Nuclides Released	Units	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 for 2014
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	Quarters 1 & 2	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	2.68E+01	±25%
	Ci	4.58E+01	±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	Quarters 1 & 2	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	None	N/A
	Ci	None	N/A
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

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.		d. Other Waste	
Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)
Carbon-14	0.28%	None		None		None	
Cobalt-58	1.23%						
Cobalt-60	31.48%						
Chromium-51	1.73%						
Cesium-137	12.48%						
Iron-55	23.77%						
Iron-59	0.34%						
Manganese-54	3.08%						
Niobium-95	0.26%						
Nickel-63	3.01%						
Antimony-124	0.21%						
Stontium-90	0.10%						
Zinc-65	21.89%						
Zirconium-95	0.23%						

(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
4	X		Truck	ES BCO, TN	
1	X		Truck	ES GR, TN	
7	X		Truck		WCS (CWF)

B. Irradiated Fuel Shipments (Disposition): None

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

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

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

Completed By:

Reviewed By:

TABLE 3 (continued)

Entergy Nuclear Vermont Yankee
Effluent and Waste Disposal Annual Report for 2014
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	Quarters 3 & 4	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	1.53E+01	±25%
	Ci	2.78E+01	±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	Quarters 3 & 4	Est. Total Error %
a. Spent resins, filter sludges, etc.	m3	1.10E+01	±25%
	Ci	5.68E+04	±25%
b. Dry Compressible waste, equipment, etc.	m3	2.36E+02	±25%
	Ci	9.63E-02	±25%
c. Irradiated components, control rods, etc.	m3	None	N/A
	Ci	None	N/A

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.		d. Other Waste	
Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)	Nuclide	Percent (1)
Carbon-14	0.13%	Cobalt-58	1.39%	None		Tritium-3	100.00%
Cobalt-58	1.31%	Cobalt-60	52.49%				
Cobalt-60	36.19%	Chromium-51	1.37%				
Chromium-51	3.29%	Cesium-137	0.19%				
Cesium-137	5.93%	Iron-55	29.71%				
Iron-55	31.20%	Iron-59	0.25%				
Iron-59	0.47%	Manganese-54	2.12%				
Manganese-54	3.94%	Niobium-95	0.23%				
Niobium-95	0.49%	Nickel-63	1.27%				
Nickel-63	1.68%	Antimony-124	0.21%				
Antimony-124	0.42%	Antimony-125	0.75%				
Antimony-125	0.14%	Zinc-65	9.93%				
Zinc-65	14.38%						
Zirconium-95	0.33%						

(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
8	X		Truck	ES-BCO, TN	
7	X		Truck	ES GR, TN	
3	X		Truck	WCS (TSD)	
4	X		Truck		WCS (CWF)
3		X	Truck		WCS (CWF)
9		X	Truck		ES Clive
7		X	Truck		Bulk survey for release to landfill

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	GDC, Type A
Solidification Agent or Absorbent Used	none	none	none

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

Completed By:

Reviewed By:

TABLE 4A

Entergy Nuclear Vermont Yankee
Maximum* Quarterly and Annual Off-Site Doses from Direct Radiation
and Liquid and Gaseous Effluents for 2014
(10CFR50, Appendix I)

Source	Dose (mrem)[a]				
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year[b]
Liquid Effluents					
Total Body Dose	1.33E-06	1.25E-06	1.16E-06	1.04E-06	4.80E-06
Footnotes	(c)	(c)	(c)	(c)	(c)
Organ Dose	1.33E-06	1.25E-06	1.16E-06	1.04E-06	4.80E-06
Footnotes	(c)	(c)	(c)	(c)	(c)
Airborne Effluents					
Iodines, H-3, C-14, and Particulates	2.92E-01	2.93E-01	2.94E-01	2.92E-01	1.17E+00
Footnotes	(f)	(f)	(f)	(f)	
Noble Gases					
Beta Air (mrad)	--	--	--	--	--
Footnotes	(d)	(d)	(d)	(d)	
Gamma Air (mrad)	--	--	--	--	--
Footnotes	(d)	(d)	(d)	(d)	
Direct Radiation					
	4.17	4.18	4.31	3.76	16.41 (e)

* "Maximum" means the largest fraction of the corresponding 10CFR50, Appendix I dose design objective.

(a) The lettered 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 from the release of H-3 to groundwater.

(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. 35, Sect. 6.11.1).

(f) The critical age group/organ for the MEI is the Child/Bone, at a location WNW, 2400 meters from the stack.

TABLE 4B

Entergy Nuclear Vermont Yankee
Maximum* Annual Off-Site Doses from Direct Radiation
and Liquid and Gaseous Effluents for 2014
(40CFR190)

Pathway	Total Body (mrem)	Maximum Organ (mrem)	Thyroid (mrem)
Direct External (a) (b)	16.41	16.41	16.41
Liquids (c)	4.80E-06	4.80E-06	4.80E-06
Gases (c)`	2.35E-01	1.17E+00	2.35E-01
Annual Total (d)	16.6	17.6	16.6

* 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 [1] (meters)	Nearest Resident[2] (meters)	Nearest Milk Animal[2] (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	--
SSW	300	451	--
SW	250	418	--
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 2014 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^3/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^2)	2	2	0.70	2	0.70	2	0.70	2
P	Soil Surface Density (kg/m^2)	240	240	240	240	240	240	240	240
T	Transport Time to User (hrs)	--	--	48	48	48	48	480	480
TB	Soil Exposure Time[(a)](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[(c)]	--	--	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[(d)]	--	--	--	--	--	--	--	--

* 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^3) shall be used to reflect conditions in the Northeast (Reference: Health Physics Journal, Volume 39 (August), 1980; Pages 318-320, Pergammon 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	2.83E-06	5.61E-04	0	2.83E-06	2.83E-06	2.83E-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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = 1.45

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	6	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	9
(1)	4.72	.00	.00	.00	.00	.79	.00	.79	.00	.00	.00	.00	.00	.00	.00	.79	.00	7.09
(2)	.07	.00	.00	.00	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.10
C-3	3	2	2	1	4	1	1	0	1	0	0	0	0	0	0	4	0	19
(1)	2.36	1.57	1.57	.79	3.15	.79	.79	.00	.79	.00	.00	.00	.00	.00	.00	3.15	.00	14.96
(2)	.03	.02	.02	.01	.05	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.05	.00	.22
4-7	9	3	2	1	6	9	3	1	0	0	0	0	0	0	5	10	0	49
(1)	7.09	2.36	1.57	.79	4.72	7.09	2.36	.79	.00	.00	.00	.00	.00	.00	3.94	7.87	.00	38.58
(2)	.10	.03	.02	.01	.07	.10	.03	.01	.00	.00	.00	.00	.00	.00	.06	.11	.00	.56
8-12	9	1	0	0	2	4	3	4	0	1	1	0	0	0	1	14	0	40
(1)	7.09	.79	.00	.00	1.57	3.15	2.36	3.15	.00	.79	.79	.00	.00	.00	.79	11.02	.00	31.50
(2)	.10	.01	.00	.00	.02	.05	.03	.05	.00	.01	.01	.00	.00	.00	.01	.16	.00	.46
13-18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	5
(1)	.79	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.15	.00	3.94
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.06
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	5
(1)	1.57	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.79	1.57	.00	3.94
(2)	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.00	.06
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	30	6	4	2	12	15	7	6	1	1	1	0	0	0	7	35	0	127
(1)	23.62	4.72	3.15	1.57	9.45	11.81	5.51	4.72	.79	.79	.79	.00	.00	.00	5.51	27.56	.00	100.00
(2)	.34	.07	.05	.02	.14	.17	.08	.07	.01	.01	.01	.00	.00	.00	.08	.40	.00	1.45

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = 2.45

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	5
(1)	.93	.00	.00	.00	.47	.47	.00	.00	.00	.00	.00	.00	.00	.00	.00	.47	.00	2.33
(2)	.02	.00	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.06
C-3	1	2	0	1	3	1	1	2	2	0	0	0	0	1	0	1	0	15
(1)	.47	.93	.00	.47	1.40	.47	.47	.93	.93	.00	.00	.00	.00	.47	.00	.47	.00	6.98
(2)	.01	.02	.00	.01	.03	.01	.01	.02	.02	.00	.00	.00	.00	.01	.00	.01	.00	.17
4-7	15	4	7	6	9	10	7	5	5	2	1	1	2	2	3	22	0	101
(1)	6.98	1.86	3.26	2.79	4.19	4.65	3.26	2.33	2.33	.93	.47	.47	.93	.93	1.40	10.23	.00	46.98
(2)	.17	.05	.08	.07	.10	.11	.08	.06	.06	.02	.01	.01	.02	.02	.03	.25	.00	1.15
8-12	13	3	0	0	0	9	2	11	5	1	1	1	0	0	3	22	0	71
(1)	6.05	1.40	.00	.00	.00	4.19	.93	5.12	2.33	.47	.47	.47	.00	.00	1.40	10.23	.00	33.02
(2)	.15	.03	.00	.00	.00	.10	.02	.13	.06	.01	.01	.01	.00	.00	.03	.25	.00	.81
13-18	3	0	0	0	0	1	0	0	3	0	0	0	0	1	0	11	0	19
(1)	1.40	.00	.00	.00	.00	.47	.00	.00	1.40	.00	.00	.00	.00	.47	.00	5.12	.00	8.84
(2)	.03	.00	.00	.00	.00	.01	.00	.00	.03	.00	.00	.00	.00	.01	.00	.13	.00	.22
19-24	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	4
(1)	.47	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.47	.93	.00	1.86
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.00	.05
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	35	9	7	7	13	22	10	18	15	3	2	2	2	4	7	59	0	215
(1)	16.28	4.19	3.26	3.26	6.05	10.23	4.65	8.37	6.98	1.40	.93	.93	.93	1.86	3.26	27.44	.00	100.00
(2)	.40	.10	.08	.08	.15	.25	.11	.21	.17	.03	.02	.02	.02	.05	.08	.67	.00	2.45

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 4.41

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	3
(1)	.00	.00	.00	.00	.00	.26	.00	.00	.00	.00	.00	.00	.26	.00	.26	.00	.00	.78
(2)	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.00	.03
C-3	2	6	4	8	9	4	3	0	0	2	1	1	0	0	3	4	0	47
(1)	.52	1.55	1.04	2.07	2.33	1.04	.78	.00	.00	.52	.26	.26	.00	.00	.78	1.04	.00	12.18
(2)	.02	.07	.05	.09	.10	.05	.03	.00	.00	.02	.01	.01	.00	.00	.03	.05	.00	.54
4-7	23	7	4	10	18	25	17	13	5	2	2	3	1	2	11	30	0	173
(1)	5.96	1.81	1.04	2.59	4.66	6.48	4.40	3.37	1.30	.52	.52	.78	.26	.52	2.85	7.77	.00	44.82
(2)	.26	.08	.05	.11	.21	.29	.19	.15	.06	.02	.02	.03	.01	.02	.13	.34	.00	1.98
8-12	20	2	0	1	1	7	8	15	10	1	4	3	5	11	10	32	0	130
(1)	5.18	.52	.00	.26	.26	1.81	2.07	3.89	2.59	.26	1.04	.78	1.30	2.85	2.59	8.29	.00	33.68
(2)	.23	.02	.00	.01	.01	.08	.09	.17	.11	.01	.05	.03	.06	.13	.11	.37	.00	1.48
13-18	2	0	0	0	0	0	0	3	2	1	0	0	2	4	5	9	0	28
(1)	.52	.00	.00	.00	.00	.00	.00	.78	.52	.26	.00	.00	.52	1.04	1.30	2.33	.00	7.25
(2)	.02	.00	.00	.00	.00	.00	.00	.03	.02	.01	.00	.00	.02	.05	.06	.10	.00	.32
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.04	.00	1.04
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.05
GT 24	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	.26	.00	.26
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
ALL SPEEDS	47	15	8	19	28	37	28	31	17	6	7	7	9	17	30	80	0	386
(1)	12.18	3.89	2.07	4.92	7.25	9.59	7.25	8.03	4.40	1.55	1.81	1.81	2.33	4.40	7.77	20.73	.00	100.00
(2)	.54	.17	.09	.22	.32	.42	.32	.35	.19	.07	.08	.08	.10	.19	.34	.91	.00	4.41

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

TABLE 5D

VERMONT YANKEE JAN 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 48.60

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	6	1	0	0	2	4	3	5	7	1	2	2	1	2	3	6	0	45
(1)	.14	.02	.00	.00	.05	.09	.07	.12	.16	.02	.05	.05	.02	.05	.07	.14	.00	1.06
(2)	.07	.01	.00	.00	.02	.05	.03	.06	.08	.01	.02	.02	.01	.02	.03	.07	.00	.51
C-3	79	48	45	57	59	57	53	63	61	50	48	21	40	51	79	107	0	918
(1)	1.86	1.13	1.06	1.34	1.39	1.34	1.25	1.48	1.43	1.17	1.13	.49	.94	1.20	1.86	2.51	.00	21.56
(2)	.90	.55	.51	.65	.67	.65	.61	.72	.70	.57	.55	.24	.46	.58	.90	1.22	.00	10.48
4-7	135	37	14	19	54	101	158	267	114	39	35	41	72	95	216	265	0	1662
(1)	3.17	.87	.33	.45	1.27	2.37	3.71	6.27	2.68	.92	.82	.96	1.69	2.23	5.07	6.23	.00	39.04
(2)	1.54	.42	.16	.22	.62	1.15	1.80	3.05	1.30	.45	.40	.47	.82	1.08	2.47	3.03	.00	18.97
8-12	143	7	0	0	11	27	23	144	115	23	18	30	132	192	116	241	0	1222
(1)	3.36	.16	.00	.00	.26	.63	.54	3.38	2.70	.54	.42	.70	3.10	4.51	2.72	5.66	.00	28.71
(2)	1.63	.08	.00	.00	.13	.31	.26	1.64	1.31	.26	.21	.34	1.51	2.19	1.32	2.75	.00	13.95
13-18	37	0	0	0	0	0	3	7	21	1	0	1	53	90	75	83	0	371
(1)	.87	.00	.00	.00	.00	.00	.07	.16	.49	.02	.00	.02	1.25	2.11	1.76	1.95	.00	8.72
(2)	.42	.00	.00	.00	.00	.00	.03	.08	.24	.01	.00	.01	.61	1.03	.86	.95	.00	4.24
19-24	2	0	0	0	0	0	0	3	3	0	0	0	1	2	8	19	0	38
(1)	.05	.00	.00	.00	.00	.00	.00	.07	.07	.00	.00	.00	.02	.05	.19	.45	.00	.89
(2)	.02	.00	.00	.00	.00	.00	.00	.03	.03	.00	.00	.00	.01	.02	.09	.22	.00	.43
GT 24	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	.02	.00	.02
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
ALL SPEEDS	402	93	59	76	126	189	240	489	321	114	103	95	299	432	497	722	0	4257
(1)	9.44	2.18	1.39	1.79	2.96	4.44	5.64	11.49	7.54	2.68	2.42	2.23	7.02	10.15	11.67	16.96	.00	100.00
(2)	4.59	1.06	.67	.87	1.44	2.16	2.74	5.58	3.66	1.30	1.18	1.08	3.41	4.93	5.67	8.24	.00	48.60

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 27.41

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	20	0	1	1	2	1	5	3	3	1	7	4	6	5	4	2	0	65
(1)	.83	.00	.04	.04	.08	.04	.21	.12	.12	.04	.29	.17	.25	.21	.17	.08	.00	2.71
(2)	.23	.00	.01	.01	.02	.01	.06	.03	.03	.01	.08	.05	.07	.06	.05	.02	.00	.74
C-3	56	20	31	18	19	27	36	60	106	119	172	149	140	137	120	89	0	1299
(1)	2.33	.83	1.29	.75	.79	1.12	1.50	2.50	4.41	4.96	7.16	6.21	5.83	5.71	5.00	3.71	.00	54.10
(2)	.64	.23	.35	.21	.22	.31	.41	.69	1.21	1.36	1.96	1.70	1.60	1.56	1.37	1.02	.00	14.83
4-7	48	4	0	1	12	16	59	95	62	21	21	29	54	53	112	145	0	732
(1)	2.00	.17	.00	.04	.50	.67	2.46	3.96	2.58	.87	.87	1.21	2.25	2.21	4.66	6.04	.00	30.49
(2)	.55	.05	.00	.01	.14	.18	.67	1.08	.71	.24	.24	.33	.62	.61	1.28	1.66	.00	8.36
8-12	19	0	0	0	0	1	9	35	28	0	3	4	35	26	27	67	0	254
(1)	.79	.00	.00	.00	.00	.04	.37	1.46	1.17	.00	.12	.17	1.46	1.08	1.12	2.79	.00	10.58
(2)	.22	.00	.00	.00	.00	.01	.10	.40	.32	.00	.03	.05	.40	.30	.31	.76	.00	2.90
13-18	9	0	0	0	0	0	0	2	8	0	0	0	6	6	7	12	0	50
(1)	.37	.00	.00	.00	.00	.00	.00	.08	.33	.00	.00	.00	.25	.25	.29	.50	.00	2.08
(2)	.10	.00	.00	.00	.00	.00	.00	.02	.09	.00	.00	.00	.07	.07	.08	.14	.00	.57
19-24	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.04
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.01
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	152	24	32	20	33	45	109	195	208	141	203	186	241	227	270	315	0	2401
(1)	6.33	1.00	1.33	.83	1.37	1.87	4.54	8.12	8.66	5.87	8.45	7.75	10.04	9.45	11.25	13.12	.00	100.00
(2)	1.74	.27	.37	.23	.38	.51	1.24	2.23	2.37	1.61	2.32	2.12	2.75	2.59	3.08	3.60	.00	27.41

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

TABLE 5F

VERMONT YANKEE JAN 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 11.94

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	1	1	5	2	1	1	0	1	0	12
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.10	.10	.48	.19	.10	.10	.00	.10	.00	1.15
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.06	.02	.01	.01	.00	.01	.00	.14
C-3	28	12	8	14	9	3	17	27	55	90	167	179	151	72	51	24	0	907
(1)	2.68	1.15	.76	1.34	.86	.29	1.63	2.58	5.26	8.60	15.97	17.11	14.44	6.88	4.88	2.29	.00	86.71
(2)	.32	.14	.09	.16	.10	.03	.19	.31	.63	1.03	1.91	2.04	1.72	.82	.58	.27	.00	10.36
4-7	3	2	0	0	1	4	3	12	12	12	18	9	12	17	11	10	0	126
(1)	.29	.19	.00	.00	.10	.38	.29	1.15	1.15	1.15	1.72	.86	1.15	1.63	1.05	.96	.00	12.05
(2)	.03	.02	.00	.00	.01	.05	.03	.14	.14	.14	.21	.10	.14	.19	.13	.11	.00	1.44
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00	.10
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.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	31	14	8	14	10	7	20	39	68	103	190	190	164	91	62	35	0	1046
(1)	2.96	1.34	.76	1.34	.96	.67	1.91	3.73	6.50	9.85	18.16	18.16	15.68	8.70	5.93	3.35	.00	100.00
(2)	.35	.16	.09	.16	.11	.08	.23	.45	.78	1.18	2.17	2.17	1.87	1.04	.71	.40	.00	11.94

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 3.73

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	1	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	6
(1)	.31	.31	.00	.00	.31	.31	.00	.00	.00	.61	.00	.00	.00	.00	.00	.00	.00	1.83
(2)	.01	.01	.00	.00	.01	.01	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.07
C-3	15	6	7	2	6	5	6	11	14	26	43	50	36	17	16	11	0	271
(1)	4.59	1.83	2.14	.61	1.83	1.53	1.83	3.36	4.28	7.95	13.15	15.29	11.01	5.20	4.89	3.36	.00	82.87
(2)	.17	.07	.08	.02	.07	.06	.07	.13	.16	.30	.49	.57	.41	.19	.18	.13	.00	3.09
4-7	2	0	0	0	0	0	0	2	8	4	8	1	3	4	10	6	0	48
(1)	.61	.00	.00	.00	.00	.00	.00	.61	2.45	1.22	2.45	.31	.92	1.22	3.06	1.83	.00	14.68
(2)	.02	.00	.00	.00	.00	.00	.00	.02	.09	.05	.09	.01	.03	.05	.11	.07	.00	.55
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.31	.31	.00	.61
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.02
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	18	7	7	2	7	6	6	13	22	32	51	51	39	21	27	18	0	327
(1)	5.50	2.14	2.14	.61	2.14	1.83	1.83	3.98	6.73	9.79	15.60	15.60	11.93	6.42	8.26	5.50	.00	100.00
(2)	.21	.08	.08	.02	.08	.07	.07	.15	.25	.37	.58	.58	.45	.24	.31	.21	.00	3.73

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

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

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	35	2	1	1	6	9	8	9	11	5	14	8	9	8	8	11	0	145
(1)	.40	.02	.01	.01	.07	.10	.09	.10	.13	.06	.16	.09	.10	.09	.09	.13	.00	1.66
(2)	.40	.02	.01	.01	.07	.10	.09	.10	.13	.06	.16	.09	.10	.09	.09	.13	.00	1.66
C-3	184	96	97	101	109	98	117	163	239	287	431	400	367	278	269	240	0	3476
(1)	2.10	1.10	1.11	1.15	1.24	1.12	1.34	1.86	2.73	3.28	4.92	4.57	4.19	3.17	3.07	2.74	.00	39.68
(2)	2.10	1.10	1.11	1.15	1.24	1.12	1.34	1.86	2.73	3.28	4.92	4.57	4.19	3.17	3.07	2.74	.00	39.68
4-7	235	57	27	37	100	165	247	395	206	80	85	84	144	173	368	488	0	2891
(1)	2.68	.65	.31	.42	1.14	1.88	2.82	4.51	2.35	.91	.97	.96	1.64	1.98	4.20	5.57	.00	33.01
(2)	2.68	.65	.31	.42	1.14	1.88	2.82	4.51	2.35	.91	.97	.96	1.64	1.98	4.20	5.57	.00	33.01
8-12	204	13	0	1	14	48	45	209	158	26	27	38	172	230	158	377	0	1720
(1)	2.33	.15	.00	.01	.16	.55	.51	2.39	1.80	.30	.31	.43	1.96	2.63	1.80	4.30	.00	19.64
(2)	2.33	.15	.00	.01	.16	.55	.51	2.39	1.80	.30	.31	.43	1.96	2.63	1.80	4.30	.00	19.64
13-18	52	0	0	0	0	1	3	12	34	2	0	1	61	101	87	119	0	473
(1)	.59	.00	.00	.00	.00	.01	.03	.14	.39	.02	.00	.01	.70	1.15	.99	1.36	.00	5.40
(2)	.59	.00	.00	.00	.00	.01	.03	.14	.39	.02	.00	.01	.70	1.15	.99	1.36	.00	5.40
19-24	5	0	0	0	0	0	0	3	4	0	0	0	1	2	10	27	0	52
(1)	.06	.00	.00	.00	.00	.00	.00	.03	.05	.00	.00	.00	.01	.02	.11	.31	.00	.59
(2)	.06	.00	.00	.00	.00	.00	.00	.03	.05	.00	.00	.00	.01	.02	.11	.31	.00	.59
GT 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	.02	.00	.02
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.02
ALL SPEEDS	715	168	125	140	229	321	420	791	652	400	557	531	754	792	900	1264	0	8759
(1)	8.16	1.92	1.43	1.60	2.61	3.66	4.80	9.03	7.44	4.57	6.36	6.06	8.61	9.04	10.28	14.43	.00	100.00
(2)	8.16	1.92	1.43	1.60	2.61	3.66	4.80	9.03	7.44	4.57	6.36	6.06	8.61	9.04	10.28	14.43	.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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = .07

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
(1)	66.67	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	66.67
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
C-3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	16.67	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	16.67
(2)	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
4-7	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
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	16.67	.00	.00	16.67
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.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	4	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	6
(1)	66.67	.00	.00	.00	.00	16.67	.00	.00	.00	.00	.00	.00	.00	.00	16.67	.00	.00	100.00
(2)	.05	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.07

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = .23

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	1	0	0	0	0	0	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	5.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.00
(2)	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
C-3	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	4
(1)	5.00	.00	.00	.00	5.00	.00	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	.00	.00	20.00
(2)	.01	.00	.00	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.05
4-7	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	4
(1)	.00	.00	5.00	.00	.00	5.00	10.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	20.00
(2)	.00	.00	.01	.00	.00	.01	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
8-12	1	0	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	6
(1)	5.00	.00	.00	5.00	5.00	5.00	.00	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	.00	30.00
(2)	.01	.00	.00	.01	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.07
13-18	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	3
(1)	5.00	.00	.00	.00	.00	.00	.00	.00	5.00	.00	.00	.00	.00	.00	.00	5.00	.00	15.00
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.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	1	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.00	.00	5.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
GT 24	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	5.00	.00	5.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
ALL SPEEDS	3	0	1	1	2	3	3	1	1	0	0	0	0	0	1	4	0	20
(1)	15.00	.00	5.00	5.00	10.00	15.00	15.00	5.00	5.00	.00	.00	.00	.00	.00	5.00	20.00	.00	100.00
(2)	.03	.00	.01	.01	.02	.03	.03	.01	.01	.00	.00	.00	.00	.00	.01	.05	.00	.23

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 1.18

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	1	0	0	0	0	0	1	0	0	2
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.97	.00	.00	.00	.00	.00	.97	.00	.00	1.94
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.01	.00	.00	.02
C-3	2	0	1	0	1	1	0	1	0	0	0	0	0	0	1	1	0	8
(1)	1.94	.00	.97	.00	.97	.97	.00	.97	.00	.00	.00	.00	.00	.00	.97	.97	.00	7.77
(2)	.02	.00	.01	.00	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.01	.01	.00	.09
4-7	3	2	0	4	4	9	3	1	0	0	0	1	0	0	0	1	0	28
(1)	2.91	1.94	.00	3.88	3.88	8.74	2.91	.97	.00	.00	.00	.97	.00	.00	.00	.97	.00	27.18
(2)	.03	.02	.00	.05	.05	.10	.03	.01	.00	.00	.00	.01	.00	.00	.00	.01	.00	.32
8-12	5	3	0	0	1	8	2	6	3	0	0	0	0	0	2	10	0	40
(1)	4.85	2.91	.00	.00	.97	7.77	1.94	5.83	2.91	.00	.00	.00	.00	.00	1.94	9.71	.00	38.83
(2)	.06	.03	.00	.00	.01	.09	.02	.07	.03	.00	.00	.00	.00	.00	.02	.11	.00	.46
13-18	5	1	0	0	0	2	0	1	0	0	0	0	0	0	1	4	0	14
(1)	4.85	.97	.00	.00	.00	1.94	.00	.97	.00	.00	.00	.00	.00	.00	.97	3.88	.00	13.59
(2)	.06	.01	.00	.00	.00	.02	.00	.01	.00	.00	.00	.00	.00	.00	.01	.05	.00	.16
19-24	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6	0	7
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.97	.00	.00	.00	.00	.00	5.83	.00	6.80
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.07	.00	.08
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.88	.00	3.88
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.05
ALL SPEEDS	15	6	1	4	6	20	5	9	4	1	0	1	0	0	5	26	0	103
(1)	14.56	5.83	.97	3.88	5.83	19.42	4.85	8.74	3.88	.97	.00	.97	.00	.00	4.85	25.24	.00	100.00
(2)	.17	.07	.01	.05	.07	.23	.06	.10	.05	.01	.00	.01	.00	.00	.06	.30	.00	1.18

(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 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 55.39

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	11	0	2	1	4	3	1	7	12	4	6	11	15	3	2	40	0	122
(1)	.23	.00	.04	.02	.08	.06	.02	.14	.25	.08	.12	.23	.31	.06	.04	.82	.00	2.51
(2)	.13	.00	.02	.01	.05	.03	.01	.08	.14	.05	.07	.13	.17	.03	.02	.46	.00	1.39
C-3	50	39	41	39	45	50	58	47	18	18	12	8	9	19	29	61	0	543
(1)	1.03	.80	.85	.80	.93	1.03	1.20	.97	.37	.37	.25	.16	.19	.39	.60	1.26	.00	11.19
(2)	.57	.45	.47	.45	.51	.57	.66	.54	.21	.21	.14	.09	.10	.22	.33	.70	.00	6.20
4-7	102	40	31	24	47	80	143	162	84	31	21	19	27	40	70	282	0	1203
(1)	2.10	.82	.64	.49	.97	1.65	2.95	3.34	1.73	.64	.43	.39	.56	.82	1.44	5.81	.00	24.79
(2)	1.16	.46	.35	.27	.54	.91	1.63	1.85	.96	.35	.24	.22	.31	.46	.80	3.22	.00	13.73
8-12	123	19	7	8	11	48	92	201	229	48	40	39	106	145	99	299	0	1514
(1)	2.54	.39	.14	.16	.23	.99	1.90	4.14	4.72	.99	.82	.80	2.18	2.99	2.04	6.16	.00	31.20
(2)	1.40	.22	.08	.09	.13	.55	1.05	2.29	2.61	.55	.46	.45	1.21	1.66	1.13	3.41	.00	17.29
13-18	125	7	0	1	5	15	16	52	129	17	10	17	111	187	79	296	0	1067
(1)	2.58	.14	.00	.02	.10	.31	.33	1.07	2.66	.35	.21	.35	2.29	3.85	1.63	6.10	.00	21.99
(2)	1.43	.08	.00	.01	.06	.17	.18	.59	1.47	.19	.11	.19	1.27	2.13	.90	3.38	.00	12.18
19-24	48	0	0	0	0	1	2	6	40	2	0	1	25	50	37	123	0	335
(1)	.99	.00	.00	.00	.00	.02	.04	.12	.82	.04	.00	.02	.52	1.03	.76	2.54	.00	6.90
(2)	.55	.00	.00	.00	.00	.01	.02	.07	.46	.02	.00	.01	.29	.57	.42	1.40	.00	3.82
GT 24	5	0	0	0	0	0	0	0	8	0	0	0	1	1	6	47	0	68
(1)	.10	.00	.00	.00	.00	.00	.00	.00	.16	.00	.00	.00	.02	.02	.12	.97	.00	1.40
(2)	.06	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.01	.01	.07	.54	.00	.78
ALL SPEEDS	464	105	81	73	112	197	312	475	520	120	89	95	294	445	322	1148	0	4852
(1)	9.56	2.16	1.67	1.50	2.31	4.06	6.43	9.79	10.72	2.47	1.83	1.96	6.06	9.17	6.64	23.66	.00	100.00
(2)	5.30	1.20	.92	.83	1.28	2.25	3.56	5.42	5.94	1.37	1.02	1.08	3.36	5.08	3.68	13.11	.00	55.39

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

TABLE 6E

VERMONT YANKEE JAN 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 30.45

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	23	1	2	1	1	4	7	4	3	0	3	0	2	1	1	13	0	66
(1)	.86	.04	.07	.04	.04	.15	.26	.15	.11	.00	.11	.00	.07	.04	.04	.49	.00	2.47
(2)	.26	.01	.02	.01	.01	.05	.08	.05	.03	.00	.03	.00	.02	.01	.01	.15	.00	.75
C-3	95	71	58	59	62	81	92	49	29	20	16	11	8	23	36	94	0	804
(1)	3.56	2.66	2.17	2.21	2.32	3.04	3.45	1.84	1.09	.75	.60	.41	.30	.86	1.35	3.52	.00	30.15
(2)	1.08	.81	.66	.67	.71	.92	1.05	.56	.33	.23	.18	.13	.09	.26	.41	1.07	.00	9.18
4-7	102	11	4	4	18	38	116	146	61	23	11	21	25	32	69	256	0	937
(1)	3.82	.41	.15	.15	.67	1.42	4.35	5.47	2.29	.86	.41	.79	.94	1.20	2.59	9.60	.00	35.13
(2)	1.16	.13	.05	.05	.21	.43	1.32	1.67	.70	.26	.13	.24	.29	.37	.79	2.92	.00	10.70
8-12	41	3	0	1	0	9	29	86	68	19	11	16	54	43	54	178	0	612
(1)	1.54	.11	.00	.04	.00	.34	1.09	3.22	2.55	.71	.41	.60	2.02	1.61	2.02	6.67	.00	22.95
(2)	.47	.03	.00	.01	.00	.10	.33	.98	.78	.22	.13	.18	.62	.49	.62	2.03	.00	6.99
13-18	10	0	0	0	0	0	3	13	36	2	6	4	30	20	20	58	0	202
(1)	.37	.00	.00	.00	.00	.00	.11	.49	1.35	.07	.22	.15	1.12	.75	.75	2.17	.00	7.57
(2)	.11	.00	.00	.00	.00	.00	.03	.15	.41	.02	.07	.05	.34	.23	.23	.66	.00	2.31
19-24	3	0	0	0	0	0	0	3	4	1	0	0	6	3	6	16	0	42
(1)	.11	.00	.00	.00	.00	.00	.00	.11	.15	.04	.00	.00	.22	.11	.22	.60	.00	1.57
(2)	.03	.00	.00	.00	.00	.00	.00	.03	.05	.01	.00	.00	.07	.03	.07	.18	.00	.48
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	4
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.04	.07	.00	.15
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.02	.00	.05
ALL SPEEDS	274	86	64	65	81	132	247	301	201	65	47	52	125	123	187	617	0	2667
(1)	10.27	3.22	2.40	2.44	3.04	4.95	9.26	11.29	7.54	2.44	1.76	1.95	4.69	4.61	7.01	23.13	.00	100.00
(2)	3.13	.98	.73	.74	.92	1.51	2.82	3.44	2.29	.74	.54	.59	1.43	1.40	2.13	7.04	.00	30.45

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

TABLE 6F

VERMONT YANKEE JAN 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 10.81

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	5	1	1	0	3	1	4	3	1	2	0	0	0	2	1	0	0	24
(1)	.53	.11	.11	.00	.32	.11	.42	.32	.11	.21	.00	.00	.00	.21	.11	.00	.00	2.53
(2)	.06	.01	.01	.00	.03	.01	.05	.03	.01	.02	.00	.00	.00	.02	.01	.00	.00	.27
C-3	42	31	22	25	39	34	46	30	16	4	18	8	12	18	19	34	0	398
(1)	4.44	3.27	2.32	2.64	4.12	3.59	4.86	3.17	1.69	.42	1.90	.84	1.27	1.90	2.01	3.59	.00	42.03
(2)	.48	.35	.25	.29	.45	.39	.53	.34	.18	.05	.21	.09	.14	.21	.22	.39	.00	4.54
4-7	39	4	2	3	4	22	57	55	24	15	15	10	15	21	35	63	0	384
(1)	4.12	.42	.21	.32	.42	2.32	6.02	5.81	2.53	1.58	1.58	1.06	1.58	2.22	3.70	6.65	.00	40.55
(2)	.45	.05	.02	.03	.05	.25	.65	.63	.27	.17	.17	.11	.17	.24	.40	.72	.00	4.38
8-12	7	0	0	0	0	2	10	20	9	6	3	2	15	13	10	32	0	129
(1)	.74	.00	.00	.00	.00	.21	1.06	2.11	.95	.63	.32	.21	1.58	1.37	1.06	3.38	.00	13.62
(2)	.08	.00	.00	.00	.00	.02	.11	.23	.10	.07	.03	.02	.17	.15	.11	.37	.00	1.47
13-18	1	0	0	0	0	0	0	0	2	2	1	1	1	1	1	2	0	12
(1)	.11	.00	.00	.00	.00	.00	.00	.00	.21	.21	.11	.11	.11	.11	.11	.21	.00	1.27
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.02	.02	.01	.01	.01	.01	.01	.02	.00	.14
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	94	36	25	28	46	59	117	108	52	29	37	21	43	55	66	131	0	947
(1)	9.93	3.80	2.64	2.96	4.86	6.23	12.35	11.40	5.49	3.06	3.91	2.22	4.54	5.81	6.97	13.83	.00	100.00
(2)	1.07	.41	.29	.32	.53	.67	1.34	1.23	.59	.33	.42	.24	.49	.63	.75	1.50	.00	10.81

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
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TABLE 6G

VERMONT YANKEE JAN 14 - DEC 14 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 1.87

WIND DIRECTION FROM

SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.61	.00	.00	.61
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
C-3	4	1	4	1	2	3	4	4	4	2	2	2	1	4	3	6	0	47
(1)	2.44	.61	2.44	.61	1.22	1.83	2.44	2.44	2.44	1.22	1.22	1.22	.61	2.44	1.83	3.66	.00	28.66
(2)	.05	.01	.05	.01	.02	.03	.05	.05	.05	.02	.02	.02	.01	.05	.03	.07	.00	.54
4-7	4	0	0	0	0	0	5	12	9	3	8	11	6	3	4	7	0	72
(1)	2.44	.00	.00	.00	.00	.00	3.05	7.32	5.49	1.83	4.88	6.71	3.66	1.83	2.44	4.27	.00	43.90
(2)	.05	.00	.00	.00	.00	.00	.06	.14	.10	.03	.09	.13	.07	.03	.05	.08	.00	.82
8-12	1	0	0	0	0	0	5	6	4	4	5	3	3	5	4	1	0	41
(1)	.61	.00	.00	.00	.00	.00	3.05	3.66	2.44	2.44	3.05	1.83	1.83	3.05	2.44	.61	.00	25.00
(2)	.01	.00	.00	.00	.00	.00	.06	.07	.05	.05	.06	.03	.03	.06	.05	.01	.00	.47
13-18	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	3
(1)	.61	.00	.00	.00	.00	.00	.00	.00	.61	.61	.00	.00	.00	.00	.00	.00	.00	1.83
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.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	10	1	4	1	2	3	14	22	18	10	15	16	10	12	12	14	0	164
(1)	6.10	.61	2.44	.61	1.22	1.83	8.54	13.41	10.98	6.10	9.15	9.76	6.10	7.32	7.32	8.54	.00	100.00
(2)	.11	.01	.05	.01	.02	.03	.16	.25	.21	.11	.17	.18	.11	.14	.14	.16	.00	1.87

(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 14 - DEC 14 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	43	2	5	2	8	9	12	14	17	6	9	11	17	6	6	53	0	220
(1)	.49	.02	.06	.02	.09	.10	.14	.16	.19	.07	.10	.13	.19	.07	.07	.61	.00	2.51
(2)	.49	.02	.06	.02	.09	.10	.14	.16	.19	.07	.10	.13	.19	.07	.07	.61	.00	2.51
C-3	194	142	126	124	150	170	201	131	67	44	48	29	30	64	89	196	0	1805
(1)	2.21	1.62	1.44	1.42	1.71	1.94	2.29	1.50	.76	.50	.55	.33	.34	.73	1.02	2.24	.00	20.61
(2)	2.21	1.62	1.44	1.42	1.71	1.94	2.29	1.50	.76	.50	.55	.33	.34	.73	1.02	2.24	.00	20.61
4-7	250	57	38	35	73	150	326	376	178	72	55	62	73	96	178	609	0	2628
(1)	2.85	.65	.43	.40	.83	1.71	3.72	4.29	2.03	.82	.63	.71	.83	1.10	2.03	6.95	.00	30.00
(2)	2.85	.65	.43	.40	.83	1.71	3.72	4.29	2.03	.82	.63	.71	.83	1.10	2.03	6.95	.00	30.00
8-12	178	25	7	10	13	68	138	320	313	77	59	60	178	206	170	521	0	2343
(1)	2.03	.29	.08	.11	.15	.78	1.58	3.65	3.57	.88	.67	.69	2.03	2.35	1.94	5.95	.00	26.75
(2)	2.03	.29	.08	.11	.15	.78	1.58	3.65	3.57	.88	.67	.69	2.03	2.35	1.94	5.95	.00	26.75
13-18	143	8	0	1	5	17	19	66	169	22	17	22	142	208	101	361	0	1301
(1)	1.63	.09	.00	.01	.06	.19	.22	.75	1.93	.25	.19	.25	1.62	2.37	1.15	4.12	.00	14.85
(2)	1.63	.09	.00	.01	.06	.19	.22	.75	1.93	.25	.19	.25	1.62	2.37	1.15	4.12	.00	14.85
19-24	51	0	0	0	0	1	2	9	44	4	0	1	31	53	43	146	0	385
(1)	.58	.00	.00	.00	.00	.01	.02	.10	.50	.05	.00	.01	.35	.61	.49	1.67	.00	4.40
(2)	.58	.00	.00	.00	.00	.01	.02	.10	.50	.05	.00	.01	.35	.61	.49	1.67	.00	4.40
GT 24	5	0	0	0	0	0	0	0	8	0	0	0	1	2	7	54	0	77
(1)	.06	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.01	.02	.08	.62	.00	.88
(2)	.06	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.01	.02	.08	.62	.00	.88
ALL SPEEDS	864	234	176	172	249	415	698	916	796	225	188	185	472	635	594	1940	0	8759
(1)	9.86	2.67	2.01	1.96	2.84	4.74	7.97	10.46	9.09	2.57	2.15	2.11	5.39	7.25	6.78	22.15	.00	100.00
(2)	9.86	2.67	2.01	1.96	2.84	4.74	7.97	10.46	9.09	2.57	2.15	2.11	5.39	7.25	6.78	22.15	.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 -

	ODCM Controls	Dose Limit
a.	Noble Gases	
	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.	Iodine-131, Iodine-133, Tritium and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days	
	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.	Liquids	
	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

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

c. Liquids

3/4.2.1 Sum of the fractions of ECL excluding noble gases (10CFR20, Appendix B, Table 2, Column 2):	$\leq$ 1.0E+01
3/4.2.1 Total noble gas concentration:	$\leq$ 2E-04 µCi/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 ±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 ±18 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 ±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 (μCi/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 2014 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 2014, the total Tritium radioactivity conservatively estimated to be released to the Connecticut River is 0.0454 Curies. No other plant-related radionuclides were detected in ground water.

b. Gaseous

There was one unplanned gaseous ground-level release (measured) during the reported period. On April 17, 2014, during a maintenance activity in the drain pit of the Advanced Offgas system, there was a brief 4-hour release of 2.80E-03 Ci of H-3.

APPENDIX B

LIQUID HOLDUP TANKS

Requirement — 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.

Response: — 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: The Brown Farm in Vernon, Vermont (formerly REMP sampling location TM-14) ceased dairy operations and milk production. The farm is currently engaged in equestrian activities in lieu of milk production. The former control location, County Farm (TM-24) also ceased operations and is no longer providing milk samples. No additional farms were added to the REMP program due to the forecast and now shutdown status of the plant. The following page shows the update to Table 7.1 of the ODCM showing the removal of these locations from the list Radiological Environmental Monitoring Stations. The maps in the ODCM continue to show the location of these farms for historical purposes.

Table 7.1

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample Direction[5]		Sample Location and Designated Code[2]	Distance (km)[5]	
1. AIRBORNE (Radioiodine and Particulate)				
	AP/CF-11	River Station No. 3-3	1.88	SSE
	AP/CF-12	N. Hinsdale, NH	3.61	NNW
	AP/CF-13	Hinsdale Substation	3.05	E
	AP/CF-14	Northfield, MA[9]	11.61	SSE
	AP/CF-15	Tyler Hill Road[4]	3.14	WNW
	AP/CF-21	Spofford Lake[9]	16.36	NNE
2. WATERBORNE				
a. Surface	WR-11	River Station No. 3-3	1.88	Downriver
	WR-21	Rt. 9 Bridge[9]	11.83	Upriver
b. Ground	WG-11	Plant Well	0.24	On-Site
	WG-12	Vernon Nursing Well	2.13	SSE
	WG-13	COB Well[4]	0.26	On-Site
	WG-14	Plant Support Bldg Well[4]	0.27	On-Site
	WG-22	Copeland Well[9]	13.73	N
c. Sediment From Shoreline	SE-11	Shoreline Downriver	0.57	SSE
	SE-12	North Storm Drain Outfall[3]	0.13	E
3. INGESTION				
a. Milk[8]	TM-11	Miller Farm	0.82	W
	TM-18	Blodgett Farm	3.60	SE
	TM-22	Franklin Farm[4]	9.73	WSW
b. Mixed Grasses	TG-11	River Station No. 3-3	1.88	SSE
	TG-12	N. Hinsdale, NH	3.61	NNW
	TG-13	Hinsdale Substation	3.05	E
	TG-14	Northfield, MA[9]	11.61	SSE
	TG-15	Tyler Hill Rd.[4]	3.07	WNW

TABLE 7.1 (Continued)

Exposure Pathway and/or Sample Direction[5]	Sample Location and Designated Code[2]		Distance (km)[5]	
	TG-21	Spofford Lake[9]	16.36	NNE
e. Silage	TC-11	Miller Farm	0.82	W
		TC-18	Blodgett Farm	3.60
	SE			
	TC-22	Franklin Farm[4]	9.73	WSW
d. Fish	FH-11	Vernon Pond	(6)	(6)
	FH-21	Rt. 9 Bridge[9]	11.83	Upriver
4. DIRECT RADIATION				
	DR-1	River Station No. 3-3	1.61	SSE
	DR-2	N. Hinsdale, NH	3.88	NNW
	DR-3	Hinsdale Substation	2.98	E
	DR-4	Northfield, MA[9]	11.34	SSE
	DR-5	Spofford Lake[9]	16.53	NNE
	DR-6	Vernon School	0.52	WSW
	DR-7	Site Boundary[7]	0.28	W
	DR-8	Site Boundary	0.25	SSW
	DR-9	Inner Ring	1.72	N
	DR-10	Outer Ring	4.49	N
	DR-11	Inner Ring	1.65	NNE
	DR-12	Outer Ring	3.58	NNE
	DR-13	Inner Ring	1.23	NE
	DR-14	Outer Ring	3.88	NE
	DR-15	Inner Ring	1.46	ENE
	DR-16	Outer Ring	2.84	ENE
	DR-17	Inner Ring	1.24	E
	DR-18	Outer Ring	2.97	E
	DR-19	Inner Ring	3.65	ESE
	DR-20	Outer Ring	5.33	ESE
	DR-21	Inner Ring	1.82	SE
	DR-22	Outer Ring	3.28	SE
	DR-23	Inner Ring	1.96	SSE
	DR-24	Outer Ring	3.89	SSE
	DR-25	Inner Ring	1.91	S

TABLE 7.1 (Continued)

Exposure Pathway and/or Sample Direction[5]	Sample Location and Designated Code[2]		Distance (km)[5]	
	DR-26	Outer Ring	3.77	S
	DR-27	Inner Ring	1.10	SSW
	DR-28	Outer Ring	2.23	SSW
	DR-29	Inner Ring	0.92	SW
	DR-30	Outer Ring	2.36	SW
	DR-31	Inner Ring	0.71	WSW
	DR-32	Outer Ring	5.09	WSW
	DR-33	Inner Ring	0.66	WNW
	DR-34	Outer Ring	4.61	W
	DR-35	Inner Ring	1.30	WNW
	DR-36	Outer Ring	4.43	WNW
	DR-37	Inner Ring	2.76	NW
	DR-38	Outer Ring	7.34	NW
	DR-39	Inner Ring	3.13	NNW
	DR-40	Outer Ring	5.05	NNW

(1) Sample locations are shown on Figures 7.1 to 7.6.

(2) Station Nos. 10 through 19 are indicator stations. Station Nos. 20 through 29 are control stations (for all except milk, silage and the direct radiation stations).

(3) To be sampled and analyzed semiannually.

(4) Non-required Control station.

(5) Distance and direction from the center of the Turbine Building for direct radiation monitors; from the plant stack for all others.

(6) Fish samples are collected from anywhere in Vernon Pond, which is adjacent to the plant (see Figure 7-1).

(7) DR-7 satisfies Control Table 3.5.1 for an inner ring direct radiation monitoring location. However, it is averaged as a Site Boundary TLD due to its close proximity to the plant.

(8) In accordance with Control Table 3.5.1, notation a, samples will be collected on the required schedule as availability of milk permits. All deviations from the sample schedule will be reported in the Annual Radiological Environmental Operating Report.

(9) Control stations

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 2014. No locations were identified which yielded a 20 percent greater dose or dose commitment than the values currently being calculated pursuant to ODCM Control 4.3.3.

APPENDIX G

PROCESS CONTROL PROGRAM

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

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

APPENDIX H

OFF-SITE DOSE CALCULATION MANUAL

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

Response: During the reporting period, Revision 35 was made to the ODCM.

The major changes included in Revision 35 to the ODCM were:

- Section 3/4 was revised to delete a reference requirement to Note 5 in Section 2 of Table 3.1.2 (Gaseous Effluent Monitoring Instrumentation). It was determined that Note 5 was in conflict with Note 2 for Section 2 and therefore should be removed as a requirement for Section 2 (CR-VTY-2013-04078 CA-0002).
- In Sections 2, 3/4, 6, 8 and 10, the word "operable" was found to be inappropriate and was replaced by the word "functional". Additionally, the word "inoperable" was replaced with the word "non-functional" and the word "operability" was replaced by "functionality" (EN-OP-104 and NRC Inspection Guide 9900) (CR-VTY-2013-04078 CA-0002).
- In the tables of Section 7 of the Offsite Dose Calculation Manual, it was determined that the out-of-business dairy farms which had provided milk for the REMP but were no longer functional, should be eliminated from the description (WT-WTVTY-2011-00116).
- Section 9 of the Offsite Dose Calculation Manual was revised to eliminate the references to the Off Gas "30 minute" delay line. This was previously evaluated under CR-VTY-2010-1676 and it was determined that the reference to the "30 minute" should be removed. (WT-WTVTY-2009-00009 CA-0010).

The revised ODCM pages have been included in the following pages of this Appendix.

7/08/2011	34	Four main sections of the ODCM were modified with significant changes to incorporate the contaminated groundwater discharge pathway to the Connecticut River: o Section 3 / 4 was revised to include the subsurface groundwater pathway in the Liquids Discharge description. Groundwater monitoring wells used to determine the extent of these releases are listed. The Southwest Well was added as Ground (Potable Drinking) Water sample location in the REMP description of Section 3 / 4. o Section 5 was revised to include a description of the determination of plant generated radionuclide concentrations in groundwater discharges. o Section 6 was revised to include methods for calculating radiation dose from plant generated radionuclides in groundwater discharges. o Section 9 was revised to include the method for determination of groundwater flows in the 17 identified streamtubes flowing from the plant site to the Connecticut River. In addition to revisions of four main sections of the ODCM, the Table of Contents, Definitions and References Sections of the ODCM were revised to reflect the additional subsections, figures, tables, definitions and references in the ODCM.
10/09/14	35	o Section 3/4 was revised to delete a reference requirement to Note 5 in Section 2 of Table 3.1.2 (Gaseous Effluent Monitoring Instrumentation). It was determined that Note 5 was in conflict with Note 2 for Section 2 and therefore should be removed as a requirement for Section 2 (CR-VTY-2013-04078 CA-0002). o Also, in Sections 2, 3/4, 6, 8 and 10, the word "operable" was found to be inappropriate and should be replaced by the word "functional". Additionally, the word "inoperable" by the word "non-functional" and the word "operability" was replaced by "functionality" (EN-OP-104 and NRC Inspection Guide 9900) (CR-VTY-2013-04078 CA-0002). o In the tables of Section 7 of the Offsite Dose Calculation Manual, it was determined that the out-of-business dairy farms which had provided milk for the REMP but were no longer functional, should be eliminated from the description (WT-WTVTY-2011-00116). Section 9 of the Offsite Dose Calculation Manual was revised to eliminate the references to the Off Gas "30 minute" delay line. This was previously evaluated under CR-VTY-2010-1676 and it was determined that the reference to the "30 minute" should be removed. (WT-WTVTY-2009-00009 CA-0010)

TABLE 2.1.1
Definitions

1. Gaseous Radwaste Treatment System – The Augmented Off-Gas System (AOG) is the gaseous radwaste treatment system which has been designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system off-gases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

2. Groundwater – For purposes of the ODCM, groundwater is defined as subsurface water which is either shallow, deep or in bedrock layers. Shallow and deep groundwater wells are sampled to determine the flow rate and contamination concentrations of groundwater flowing to the Connecticut River above or on the bedrock layer. Bedrock groundwater wells, utilized for drinking water purposes both on and off the plant site, are monitored for radioactive contamination as part of the REMP.

3. Hot Standby - Hot standby means operation with the reactor critical and the main steam line isolation valves closed.

4. Immediate - Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.

5. Instrument Calibration - An instrument calibration means the adjustment of an instrument signal output so that it corresponds, within acceptable range and accuracy, to a known value(s) of the parameter which the instrument monitors. Calibration shall encompass the entire instrument including actuation, alarm, or trip. Response time as specified is not part of the routine instrument calibration but will be checked once per operating cycle.

6. Instrument Check - An instrument check is qualitative determination of acceptable operability by observation of instrument behavior during operation. This determination shall include, where possible, comparison of the instrument with other independent instruments measuring the same variable.

7. Instrument Functional Test - An instrument functional test shall be:

   a. Analog channels - the injection of a signal into the channel as close to the sensor as practicable to verify operability including alarm and/or trip functions.

   b. Bistable channels - the injection of a signal into the sensor to verify the functionality including alarm and/or trip functions.

8. Off-Site Dose Calculation Manual (ODCM) – A manual containing the current methodology and parameters used in the calculation of off-site doses due to radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduction of the environmental radiological monitoring program. The ODCM shall also contain (1) the Radioactive Effluent Controls (including the Radiological Environmental Monitoring) Program required by Technical Specification 6.7.D, and (2) descriptions of the information that should be included in the annual Radioactive Effluent Release Report and Annual Radiological Environmental Operating Report required by Technical Specifications 6.6.D and 6.6.E, respectively.

9. Refueling Outage - Refueling outage is the period of time between the shutdown of the unit prior to a refueling and the startup of the plant subsequent to that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled refueling outage; however, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.

10. Site Boundary – The site boundary is shown in Plant Drawing 5920-6245.

11. Source Check - The qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

12. Streamtube(s) – Defined as flows of subsurface groundwater (having discrete width, depth and flow rate characteristics) in either the shallow or deep layers of permeable soils above the bedrock layer at the plant site. Streamtube flows are from west to east, towards the Connecticut River, and are assumed to discharge into the Connecticut River.

13. Surveillance Frequency - Unless otherwise stated in these specifications, periodic surveillance tests, checks, calibrations, and examinations shall be performed within the specified surveillance intervals. These intervals may be adjusted plus 25%. The operating cycle interval is considered to be 18 months and the tolerance stated above is applicable.

14. Surveillance Interval - The surveillance interval is the calendar time between surveillance tests, checks, calibrations, and examinations to be performed upon an instrument or component when it is required to be functional. These tests unless otherwise stated in these specifications may be waived when the instrument, component, or system is not required to be functional, but these tests shall be performed on the instrument, component, or system prior to being required to be functional.

3/4.0 EFFLUENT AND ENVIRONMENTAL CONTROLS

This section includes the effluent and environmental controls that were originally part of the Vermont Yankee Technical Specifications. These controls were relocated into the ODCM without any substantial changes, in accordance with NRC Generic Letter 89-01. Text and tables were reformatted to the style of the ODCM. The various controls were renumbered from the original numbering scheme of the Technical Specifications. A cross-reference of the old Technical Specifications section to the new ODCM section is presented in Table 1.1.8.

3/4.1 INSTRUMENTATION

3/4.1.1 Radioactive Liquid Effluent Instrumentation

CONTROLS

3.1.1 The radioactive liquid effluent monitoring instrumentation channel shall be functional in accordance with Control Table 3.1.1 with their alarm setpoints set to ensure that the limits of Control 3.2.1 are not exceeded.

APPLICABILITY:

During periods of release through monitored pathways as listed on Table 3.1.1.

ACTION:

a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of Control 3.2.1 are met, without delay suspend the release of radioactive liquid effluents monitored by the affected channel or change the setpoint so that it is acceptably conservative or declare the channel non-functional.

b. With one or more radioactive liquid effluent monitoring instrumentation channels non-functional, take the action shown in Table 3.1.1.

SURVEILLANCE REQUIREMENTS

4.1.1.a Each radioactive liquid effluent monitoring instrumentation channel shall be tested and calibrated as indicated in Table 4.1.1.

4.1.1.b The setpoints for monitoring instrumentation shall be determined in accordance with the ODCM (Section 8.1).

TABLE 3.1.1

Liquid Effluent Monitoring Instrumentation

	Minimum Channels Functional	Notes
1. Gross Radioactivity Monitors not Providing Automatic Termination of Release		
a. Liquid Radwaste Discharge Monitor (RM-17-350)	1*	1,4
b. Service Water Discharge Monitor (RM-17-351)	1	2,4
2. Flow Rate Measurement Devices		
a. Liquid Radwaste Discharge Flow Rate Monitor (FIT-20-485/442)	1*	3,4

* During releases via this pathway

TABLE 3.1.1 NOTATION

NOTE 1 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases may continue provided that prior to initiating a release:

a. At least two independent samples are analyzed in accordance with Control 4.2.1, and

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and discharge line valving.

Otherwise, suspend release of radioactive effluents via this pathway.

NOTE 2 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via this pathway may continue provided that, at least once per 24 hours, grab samples are collected and analyzed for gross radioactivity (beta or gamma) at a lower limit of detection of at least 10^{-7} microcurie/ml.

NOTE 3 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves may be used to estimate flow.

NOTE 4 - With the number of channels functional less than required by the minimum channels functional requirement, exert reasonable efforts to return the instrument(s) to functional status prior to the next release.

3/4.1 INSTRUMENTATION

3/4.1.2 Radioactive Gaseous Effluent Instrumentation

CONTROLS

3.1.2 The gaseous process and effluent monitoring instrumentation channels shall be functional in accordance with Control Table 3.1.2 with their alarm/trip setpoints set to ensure that the limits of Controls 3.3.1.a, and Technical Specifications 3.8.J.1 and 3.8.K.1 (Control 3.3.7) are not exceeded.

APPLICABILITY:

As shown in Table 3.1.2.

ACTION:

a. With a gaseous process or effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of Control 3.3.1.a and Technical Specification 3.8.K.1 are met, immediately take actions to suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel non-functional, or change the setpoint so it is acceptably conservative.

b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels functional, take actions noted in Table 3.1.2.

SURVEILLANCE REQUIREMENTS

4.1.2.a Each gaseous process or effluent monitoring instrumentation channel shall be tested and calibrated as indicated in Table 4.1.2.

4.1.2.b The setpoints for monitoring instrumentation shall be determined in accordance with the ODCM (Section 8.2).

TABLE 3.1.2

Gaseous Effluent Monitoring Instrumentation

Instrument	Minimum Channels Functional	Notes
1. Steam Jet Air Ejector (SJAE)		
a. Noble Gas Activity Monitor * (RM-17-150A/B)	1	7, 8, 9
2. Augmented Off-Gas System		
a. Noble Gas Activity Monitor Between the Charcoal Bed System and the Plant Stack (Providing Alarm and Automatic Termination of Release) (RAN-OG-3127, RAN-OG-3128)	1	2, 6, 7
b. Flow Rate Monitor (FI-OG-2002, FI-OG-2004, FI-OG-2008)	1	1, 5, 6
c. Hydrogen Monitor (H2AN-OG-2921A/B, H2AN-OG-2922A/B)	1	3, 5, 6
3. Plant Stack		
a. Noble Gas Activity Monitor (RM-17-156, RM-17-157)	1	5, 7, 10
b. Iodine Sampler Cartridge	1	4, 5
c. Particulate Sampler Filter	1	4, 5
d. Sampler Flow Integrator (FI-17-156/157)	1	1, 5
e. Stack Flow Rate Monitor (FI-108-22)	1	1, 5

* This instrumentation channel(s) is required to support compliance with Technical Specification 3.8.K.

TABLE 3.1.2 NOTATION

NOTE 1 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

NOTE 2 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via this pathway may continue for a period of up to 7 days provided that at least one of the stack monitoring systems is functional and off-gas system temperature and pressure are measured continuously.

NOTE 3 - With the number of channels functional less than required by the minimum channels functional requirement, operation of the AOG System may continue provided gas samples are collected at least once per 24 hours and analyzed within the following 4 hours, or an orderly transfer of the off-gas effluents from the operating recombiner to the standby recombiner shall be made.

NOTE 4 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via the affected pathway may continue provided samples are continuously collected with auxiliary sampling equipment.

NOTE 5 - With the number of channels functional less than required by the minimum channels functional requirement, exert reasonable efforts to return the instrument(s) to functional status within 30 days.

NOTE 6 - During releases via this pathway.

NOTE 7 - The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the Off-Site Dose Calculation Manual (ODCM).

NOTE 8 - Minimum channels functional required only during operation of the Steam Jet Air Ejector.

NOTE 9 - With the number of channels functional less than required by the minimum channels functional requirement, gases from the SJAE may be released to the environment for up to 72 hours provided:

1. The AOG System is not bypassed; and
2. The AOG System noble gas activity monitor is functional.

NOTE 10 - With the number of channels functional less than required by the minimum channels functional requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours.

6.4 Method to Calculate the Total Body Dose Rate From Noble Gases

Effluent Control 3.3.1 limits the instantaneous dose rate at any time to the total body from all release sources of noble gases at any location at or beyond the site boundary equal to or less than 500 mrem/year.

Use Method I first to calculate the Total Body Dose Rate from the peak release rate via both elevated and ground level release points. The dose rate limit of Control 3.3.1.a is the total contribution from both ground and elevated releases occurring during the period of interest.

Use Method II if Method I predicts a dose rate greater than the Control limit (i.e., use of actual meteorology over the period of interest) to determine if, in fact, Control 3.3.1 had actually been exceeded during a short time interval.

Compliance with the dose rate limits for noble gases are continuously demonstrated when effluent release rates are below the plant stack noble gas activity monitor alarm setpoint by virtue of the fact that the alarm setpoint is based on a value which corresponds to the off-site dose rate limit of Control 3.3.1, or a value below it, taking into account the potential contribution of releases from all ground level sources.

Determinations of dose rates for compliance with Control (3.3.1) are performed when the effluent monitor alarm setpoint is exceeded and the corrective action required by Control 3.3.1 is unsuccessful, or as required by the notations to Control Table 3.1.2 when the stack noble gas monitor is non-functional.

6.5 Method to Calculate the Skin Dose Rate from Noble Gases

Effluent Control 3.3.1 limits the instantaneous dose rate at any time to the skin from all release sources of noble gases at any location at or beyond the site boundary to 3,000 mrem/year.

Use Method I first to calculate the Skin Dose Rate from both elevated and ground level release points to the atmosphere. The dose rate limit of Control 3.3.1.a is the total contribution from both ground and elevated releases occurring during the period of interest. Method I applies at all release rates.

Use Method II if Method I predicts a dose rate greater than the Control limits (i.e., use of actual meteorology over the period of interest) to determine if, in fact, Control 3.3.1 had actually been exceeded during a short time interval.

Compliance with the dose rate limits for noble gases are continuously demonstrated when effluent release rates are below the plant stack noble gas activity monitor alarm setpoint by virtue of the fact that the alarm setpoint is based on a value which corresponds to the off-site Control dose rate limit, or a value below it, taking into account the potential contribution releases from all ground level sources.

Determinations of dose rate for compliance with Control (3.3.1) are performed when the effluent monitor alarm setpoint is exceeded and the corrective action required by Control 3.3.1 is unsuccessful, or as required by the notations to Control Table 3.1.2 when the stack noble gas monitor is non-functional.

Table 7.1

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample Direction[5]		Sample Location and Designated Code[2]	Distance (km)[5]	
1. AIRBORNE (Radioiodine and Particulate)				
	AP/CF-11	River Station No. 3-3	1.88	SSE
	AP/CF-12	N. Hinsdale, NH	3.61	NNW
	AP/CF-13	Hinsdale Substation	3.05	E
	AP/CF-14	Northfield, MA[9]	11.61	SSE
	AP/CF-15	Tyler Hill Road[4]	3.14	WNW
	AP/CF-21	Spofford Lake[9]	16.36	NNE
2. WATERBORNE				
a. Surface	WR-11	River Station No. 3-3	1.88	Downriver
	WR-21	Rt. 9 Bridge[9]	11.83	Upriver
b. Ground	WG-11	Plant Well	0.24	On-Site
	WG-12	Vernon Nursing Well	2.13	SSE
	WG-13	COB Well[4]	0.26	On-Site
	WG-14	Plant Support Bldg Well[4]	0.27	On-Site
	WG-22	Copeland Well[9]	13.73	N
c. Sediment From Shoreline	SE-11	Shoreline Downriver	0.57	SSE
	SE-12	North Storm Drain Outfall[3]	0.13	E
3. INGESTION				
a. Milk[8]	TM-11	Miller Farm	0.82	W
	TM-18	Blodgett Farm	3.60	SE
	TM-22	Franklin Farm[4]	9.73	WSW
b. Mixed Grasses	TG-11	River Station No. 3-3	1.88	SSE
	TG-12	N. Hinsdale, NH	3.61	NNW
	TG-13	Hinsdale Substation	3.05	E
	TG-14	Northfield, MA[9]	11.61	SSE
	TG-15	Tyler Hill Rd.[4]	3.07	WNW

TABLE 7.1 (Continued)

Exposure Pathway and/or Sample Direction[5]	Sample Location and Designated Code[2]		Distance (km)[5]	
	TG-21	Spofford Lake[9]	16.36	NNE
c. Silage	TC-11	Miller Farm	0.82	W
		TC-18	Blodgett Farm	3.60 SE
	TC-22	Franklin Farm[4]	9.73	WSW
d. Fish	FH-11	Vernon Pond	(6)	(6)
	FH-21	Rt. 9 Bridge[9]	11.83	Upriver
4. DIRECT RADIATION				
	DR-1	River Station No. 3-3	1.61	SSE
	DR-2	N. Hinsdale, NH	3.88	NNW
	DR-3	Hinsdale Substation	2.98	E
	DR-4	Northfield, MA[9]	11.34	SSE
	DR-5	Spofford Lake[9]	16.53	NNE
	DR-6	Vernon School	0.52	WSW
	DR-7	Site Boundary[7]	0.28	W
	DR-8	Site Boundary	0.25	SSW
	DR-9	Inner Ring	1.72	N
	DR-10	Outer Ring	4.49	N
	DR-11	Inner Ring	1.65	NNE
	DR-12	Outer Ring	3.58	NNE
	DR-13	Inner Ring	1.23	NE
	DR-14	Outer Ring	3.88	NE
	DR-15	Inner Ring	1.46	ENE
	DR-16	Outer Ring	2.84	ENE
	DR-17	Inner Ring	1.24	E
	DR-18	Outer Ring	2.97	E
	DR-19	Inner Ring	3.65	ESE
	DR-20	Outer Ring	5.33	ESE
	DR-21	Inner Ring	1.82	SE
	DR-22	Outer Ring	3.28	SE
	DR-23	Inner Ring	1.96	SSE
	DR-24	Outer Ring	3.89	SSE
	DR-25	Inner Ring	1.91	S

Usually F_d/F_m is greater than DF_{min} (i.e., there is more dilution than necessary to comply with Equation 8-7). The response of the liquid radwaste discharge monitor at the setpoint is therefore:

$$R_{setpoint} = \frac{DF}{DF_{min}} \quad S_i \quad \sum_i \quad C_{mi} \qquad (8\text{-}1)$$

$$(cps) \qquad (\#) \qquad \left(\frac{cps - ml}{\mu Ci}\right) \quad \left(\frac{\mu Ci}{ml}\right)$$

8.1.2 Service Water Discharge Monitor (RM-17-351)

The service water pathway shown on Figure 9-1 is continuously monitored by the service water discharge monitor (RM-17-351). The water in this line is not radioactive under normal operating conditions. The alarm setpoint on the Service Water Monitor (SWM) is set in accordance with the monitor's ability to detect dilute concentrations of radionuclide mixes that are based on measured nuclide distributions in reactor coolant. From routine coolant sample gamma isotopic analyses, a Composite Maximum Permissible Concentration (CMPC) is calculated as follows:

$$C(f_1/MPC_1 + f_2/MPC_2 \ldots) = C/CMPC$$

or

$$CMPC = 1/(f_1/MPC_1 + f_2/MPC_2 \ldots) \qquad (8\text{-}22)$$

where:

C = Total concentration of detected radioactivity in reactor coolant sample (μCi/ml)

f_i = Fraction of total radionuclide concentration represented by the ith radionuclide in the mix

MPC_i = Maximum Permissible Concentration limit for radionuclide "i" as listed in 10CFR20.106, Appendix B, Table II, Column 2 (μCi/ml)

The Composite Effluent Concentration Limit (CECL) is also calculated using the equation above by substituting the appropriate ECL value from 10CFR20.1001-20.2402, Appendix B, Table 2, Column 2, for MPC. If the SWM's minimum achievable alarm setpoint is higher than the required CMPC equivalent count rate (or the CECL equivalent count rate if it is lower than the CMPC count rate), the monitor is declared non-functional, and daily SWM grab samples are collected and analyzed until the calculated coolant CMPC (or CECL) equivalent count rate is above the SWM's alarm setpoint.

Hydrogen control is accomplished by providing redundant hydrogen analyzers on the outlet from the Recombiner System. These analyzers initiate recombiner system shutdown and switchover if the hydrogen concentration at the system outlet exceeds 2% by volume. During an automatic shutdown, two main air process valves close to isolate the recombiner system. Additionally, the recombiner bed temperatures and recombiner outlet temperature provide information about recombiner performance to insure that inflammable hydrogen mixtures do not go beyond the recombiner.

Should a number of unlikely events occur, it would be hypothetically possible for a hydrogen explosion to occur in the off-gas system. Such an explosion within the recombiner system could propagate into the large delay pipe, through the condenser/dryer subsystem, and into the charcoal absorber tanks. However, the recombiner/adsorber subsystems, piping, and vessels are designed to withstand hydrogen detonation pressures of 500 psi at a minimum so that no loss of integrity would result. Furthermore, the seven tanks of charcoal would significantly attenuate a detonation shock wave and prevent damage to the downstream equipment.

During normal operation, the dryer/adsorber subsystem may be bypassed if it becomes unavailable provided the releases are within effluent Control limits. With the dryer/adsorber subsystem bypassed, the air ejector off-gas exhausts through the recombiner/condenser subsystems, and the delay pipe.

The off-gas mixture combines with steam at the air ejector stage to prevent an inflammable hydrogen mixture of 4% by volume from entering the downstream hydrogen recombiners. Approximately 6,400 lb/hr of steam introduced at the second stage air ejector reduces the concentration of hydrogen to less than 3% by volume.

The recombiner subsystem consists of a single path leading from the hydrogen dilution steam jet ejectors to two parallel flow paths for hydrogen recombination. Each recombination subsystem is capable of operating independently of the other and each is capable of handling the condenser off-gas at a startup design flow of 1,600 lb/hr air and the normal off-gas design flow rate of 370 lb/hr. The major components of each recombiner flow path are a preheater, a hydrogen-oxygen recombiner, and a desuperheating condenser.

With the limits of Control 3.4.1 being exceeded during the calendar year, the Radioactive Effluent Release Report shall also include an assessment of radiation doses to the likely most exposed real member(s) of the public from reactor releases (including doses from primary effluent pathways and direct radiation) for the previous calendar year to show conformance with 40CFR190, Environmental Radiation Protection Standards for Nuclear Power Operation.

The Radioactive Effluent Release Report shall include a list and description of unplanned releases from the site to site boundary of radioactive materials in gaseous and liquid effluents made during the reporting period.

With the quantity of radioactive material in any outside tank exceeding the limit of Technical Specification 3.8.D.1, describe the events leading to this condition in the next Radioactive Effluent Release Report.

If non-fucntional radioactive liquid effluent monitoring instrumentation is not returned to functional status prior to the next release pursuant to Note 4 of Control Table 3.1.1, explain in the next Radioactive Effluent Report the reason(s) for delay in correcting the inoperability.

If non-functional gaseous effluent monitoring instrumentation is not returned to functional status within 30 days pursuant to Note 5 of Control Table 3.1.2, explain in the next Radioactive Effluent Release Report the reason(s) for delay in correcting the inoperability.

With milk samples no longer available from one or more of the sample locations required by Control Table 3.5.1, identify the cause(s) of the sample(s) no longer being available, identify the new location(s) for obtaining available replacement samples, and include revised ODCM figure(s) and table(s) reflecting the new location(s) in the next Radioactive Effluent Release Report.

With a land use census identifying one or more locations which yield at least a 20 percent greater dose or dose commitment than the values currently being calculated in Control 4.3.3, identify the new location(s) in the next Radioactive Effluent Release Report.

Changes made during the reporting period to the Process Control Program (PCP) and to the Off-Site Dose Calculation Manual (ODCM), shall be identified in the next Radioactive Effluent Release Report.

10.2 Environmental Radiological Monitoring

The Annual Radiological Environmental Operating Report covering the operation of the unit during previous calendar year shall be submitted by May 15th of each year.

The report shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period. The material provided shall be consistent with the objectives outlined in the ODCM and in 10CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

The Annual Radiological Environmental Operating Report shall include summarized and tabulated results of all radiological environmental samples taken during the report period pursuant to Table 7-1 and Figures 7-1 through 7-6. In the event that some results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

With the level of radioactivity in an environmental sampling media at one or more of the locations specified in Control Table 3.5.1 exceeding the reporting levels of Control Table 3.5.2, the condition shall be described in the next Annual Radiological Environmental Operating Report only if the measured level of radioactivity was not the result of plant effluents. With the radiological environmental monitoring program not being conducted as specified in Control Table 3.5.1, a description of the reasons for not conducting the program as required and the plans for preventing a recurrence shall be included in the next Annual Radiological Environmental Operating Report.

The Annual Radiological Environmental Operating Report shall also include the results of the land use census required by Control 3.5.2. A summary description of the radiological environmental monitoring program including a map of all sampling locations keyed to a table giving distances and directions from the reactor shall be in the reports. If new environmental sampling locations are identified in accordance with Control 3.5.2, the new locations shall be identified in the next Annual Radiological Environmental Operating Report.

The reports shall also include a discussion of all analyses in which the LLD required by Control Table 4.5.1 was not achievable.

The results of license participation in the intercomparison program required by Control 3.5.3 shall be included in the reports. With analyses not being performed as required by Control 3.5.3, the corrective actions taken to prevent a recurrence shall be reported to the Commission in the next Annual Radiological Environmental Operating Report.

10.3 ISFSI Reporting Requirements

In accordance with 10CFR72.44(d)(3), the Annual Independent (Interim) Spent Fuel Storage Installation Radiactive Effluent Control Program Report (AISFSIRECPR) will be generated and issued by February 28th of each year.

Since it has been determined by Holtec International in their Final Safety Analysis Report (Reference I) that the Holtec HI-STORM 100 Cask System does not create any radioactive materials or have any radioactive waste treatment systems, specific operating procedures for the control of radioactive effluents are not required. Specification 3.1.1, Multi-Purpose Canister (MPC), provides assurance that there are no radioactive effluents from the SFSC.

In light of the information presented in the previous paragraphs, the AISFSIRECPR, to be issued by February 28th of each year, shall state that no radioactive effluents were discharged from the Independent (Interim) Spent Fuel Storage Installation and therefore no ISFSI-specific monitoring program is in place at Vermont Yankee and there are no ISFSI-specific data to report for the previous calendar year reporting period.

10.4 Special Reports

Special reports shall be submitted to the Director of the Office of Inspection and Enforcement Regional Office within the time period specified for each report.

10.4.1 Liquid Effluents (Controls 3.2.2 and 3.2.3)

With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the limits of Control 3.2.2, prepare and submit to the Commission within 30 days a special report which identifies the cause(s) for exceeding the limit(s) and defines the corrective actions taken to assure that subsequent releases will be in compliance with the limits of Control 3.2.2.

With liquid radwaste being discharged without processing through appropriate treatment systems and estimated doses in excess of Control 3.2.3, prepare and submit to the Commission within 30 days a special report which includes the following information:

(1) explanation of why liquid radwaste was being discharged without treatment, identification of any non-functional equipment or subsystems, and the reasons for the non-functionality;

(2) action(s) taken to restore the non-functional equipment to functional status; and

(3) summary description of action(s) taken to prevent a recurrence.

10.4.2 Gaseous Effluents (Controls 3.3.2, 3.3.3, 3.3.4 and 3.3.5)

With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the limits of Control 3.3.2, prepare and submit to the Commission within 30 days a special report which identifies the cause(s) for exceeding the limit(s) and the corrective action(s) taken to assure that subsequent releases will be in compliance with the limits of Control 3.3.2. With the calculated dose from the release of Iodine-131, Iodine-133, tritium, and/or radionuclides in particulate form exceeding any of the limits of Control 3.3.3, prepare and submit to the Commission within 30 days a special report which identifies the cause(s) for exceeding the limit(s) and the corrective action(s) taken to assure that subsequent releases will be in compliance with the limits of Control 3.3.3.

With gaseous radwaste being discharged without processing through appropriate treatment systems as defined in Control 3.3.4 for more than seven (7) consecutive days, or in excess of the limits of Control 3.3.5, prepare and submit to the Commission within 30 days a special report which includes the following information:

(1) explanation of why gaseous radwaste was being discharged without treatment (Control 3.3.4), or with resultant doses in excess of Control 3.3.5, identification of any non-functional equipment or subsystems, and the reasons for the non-functionality;

(2) action(s) taken to restore the non-functional equipment to functional status; and

(3) summary description of action(s) taken to prevent a recurrence.

10.4.3 Total Dose (Control 3.4.1)

With the calculated dose from the release of radioactive materials in liquid or gaseous effluents exceeding the limits of Control 3.4.1, prepare and submit to the Commission within 30 days a special report which defines the corrective action(s) to be taken to reduce subsequent releases to prevent recurrence of exceeding the limits of Control 3.4.1 and includes the schedule for achieving conformance with these limits. This special report, required by 10CFR Part 20.2203(a)(4), shall include an analysis that estimates the radiation exposure (dose) to a member of the public from station sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s) covered by this report. It shall also describe levels of radiation and concentrations of radioactive material involved, and the cause of the exposure levels or concentrations. If the estimated doses exceed any of the limits of Control 3.4.1, and if the release condition resulting in violation of 40CFR Part 190 has not already been corrected, the special report shall include a request for a variance in accordance with the provisions of 40CFR Part 190. Submittal of the report is considered a timely request, and a variance is granted until staff action on the request is complete.

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 11,000 gallons of septic waste during October of 2014, and no spreading activities for cooling tower silt or sand/soil type materials. The total radioactivity spread on the 1.9 acres (southern) on-site disposal field from this and previous years was as follows:

Radionuclide	Activity Spread in 2014 (Ci)	Activity from All Past and Current Disposals Decayed to 10/7/2014 (Ci)
Mn-54	1.832E-10	2.72E-08
Co-60	8.987E-09	1.11E-05
Zn-65	4.503E-10	1.08E-08
Cs-134	0.000E+00	9.46E-10
Cs-137	2.907E-10	7.68E-05

The maximum organ dose from all past and current spreading operations totaled 1.12E-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 2.08E-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.