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U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-001

Reference: License No. DPR-3 (Docket No. 50-29)

Subject: 2005 Annual Radiological Effluent Release Report and Offsite Dose Calculation Manual

Yankee Atomic Electric Company (YAEC) herewith submits its 2005 Annual Radiological Effluent Release Report (ARERR) and Revision 18 to the Offsite Dose Calculation Manual (ODCM). The ARERR provides a summary of the quantities of radioactive liquid and gaseous effluent and solid waste released at the Rowe site and also includes a summary of estimated dose commitments from all radioactive liquid and gaseous effluents released in 2005. This information is submitted in accordance with the Quality Assurance Program (formerly referred to as the Yankee Decommissioning Quality Assurance Program) and the ODCM.

The enclosed Revision 18 of the ODCM is being submitted in accordance with Appendix D, Section B.5.d.3, of the YDQAP. This revision of the ODCM was approved on August 4, 2005.

Should you have any questions regarding this submittal, please contact Alice Carson at (301) 916-3995 or the undersigned at (413) 424-2261.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

Joseph Lynch
Regulatory Affairs Manager

Enclosure

cc: S. Collins, NRC Region I Administrator
J. Hickman, NRC Project Manager

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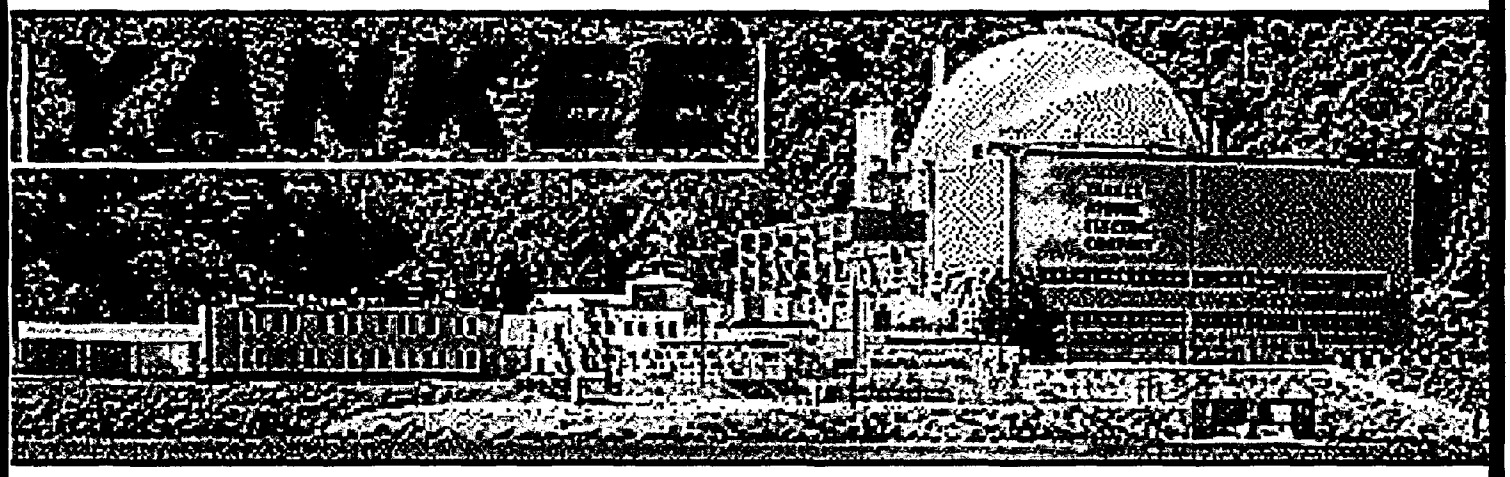

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

(ARERR)

YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS

JANUARY 1, 2005 - DECEMBER 31, 2005

DOCKET NO. 50-29
LICENSE NO. DPR-3

YANKEE ATOMIC ELECTRIC COMPANY
Rowe, Massachusetts

AREVA DOC. # 47-9016838-000

NOTES:

1. Yankee Nuclear Power Station's last day at any power level was October 1, 1991. The facility is permanently shut down and in the final stages of decommissioning with all primary plant systems and buildings having been dismantled and removed from the site. Due to ceased power operations, short-lived nuclides have been deleted from the gaseous and liquid effluent tables. Their activity concentrations in the fuel inventory have decayed to zero values. All spent fuel and other radioactive materials that had been stored in the Spent Fuel Pool have been relocated to an on-site dry fuel storage facility with no effluent release points.

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ANNUAL (2005) RADIOACTIVE EFFLUENT RELEASE REPORT
YANKEE NUCLEAR POWER STATION
ROWE, MASSACHUSETTS

1.0 INTRODUCTION

The Yankee Decommissioning Quality Assurance Program (YDQAP), Appendix D, requires that an Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted (to the NRC) before May 1 of each year. This report includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the site. The material provided is (1) consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM) and Process Control Program (PCP) for solid waste, and (2) is in conformance with 10CFR50.36a and Section IV.B.1 of Appendix I to 10CFR50. ODCM Control 7.2 details the specific information to be included in the annual report.

In July 2002, the first dry spent fuel storage canister was placed on the Independent Spent Fuel Storage Installation (ISFSI) pad located within the station's protected area. By design, there are no liquid or gaseous effluent release pathways from storage canisters once placed on the ISFSI pad. In June 2003, all transfers of spent fuel and greater than Class C materials requiring storage in the ISFSI were completed. Following the completion of these transfers to dry storage, the Spent Fuel Pool (SFP) water inventory was processed by filtration and demineralization and released to the environment as a controlled liquid waste discharge in accordance with our NPDES permit and the ODCM. The discharge of the SFP water represented the last major source of station process water requiring processing as part of station decommissioning. Potential sources of waste water remaining which could require treatment include items such as equipment decontamination, laboratory drains and building sumps / french excavations that handle ground water and potential surface runoff (construction dewatering).

Tables 1A through 3 list the recorded radioactive gaseous (including postulated airborne materials) and liquid effluents and solid waste, respectively, with data summarized on a quarterly basis for the year. Table 4 summarizes the estimated radiological dose commitments from all radioactive liquid and gaseous effluents released during the year 2005, as well as the direct dose from station related activities, including the ISFSI. Table 5 summarizes the total dose to the maximally impacted off-site individual from all station related sources for 2005.

As required by ODCM Control 7.2.b, dose commitments resulting from the release of radioactive materials in liquids and gases were estimated in accordance with the models and parameters identified in the ODCM (Reference 1). These dose estimates were made using a Method II analysis as described in the ODCM. A Method II analysis incorporates the methodology of Regulatory Guide 1.109 (Reference 2) using historic meteorological data. For gaseous releases, five years of historic (1992-1996) quarterly meteorological data were used for determining the gaseous pathway doses. As required by Control 7.2.b, this report also includes 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. However, for this reporting period, there were no recreational facilities open to the public inside the site boundary (on land), nor was permission requested or granted for recreational use of station property. Shoreline activities associated with Sherman Pond and the Deerfield River were included in the dose assessments to the maximum individual. The dose impacts for over-water activities, such as boating, are not significant due to the self-shielding of water and the transient nature of the activity leading to low occupancy times. The limited use of the Information Center on-site is associated with educational activities as they pertain to the operation / decommissioning of the station and as such, is not included under Control 7.2.b. Assessment of radiation doses (including direct radiation) to the most likely exposed real member(s) of the public for the calendar year for the purposes of demonstrating conformance with 40CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," also are included.

All calculated dose estimates for this reporting period are well below the regulatory dose criteria of 10CFR Part 50, Appendix I and 40CFR Part 190.

Appendices A through J indicate the status of reportable items per the requirements of the following documents:

Appendix	Title	Requirement Reference
A	Radioactive Liquid Effluent Monitoring Instrumentation	The requirement to maintain operable liquid monitoring instrumentation has been deleted. (ODCM, Rev.18)
B	Radioactive Gaseous Effluent Monitoring Instrumentation	The requirement to maintain operable gaseous monitoring instrumentation has been deleted. (ODCM, Rev.18)
C	Liquid Holdup Tanks	YDQAP; Appendix D, Section H
D	Radiological Environmental Monitoring Program	ODCM (Rev.18) Control 4.1
E	Land Use Census	ODCM (Rev.18) deleted the requirement to conduct a census.
F	Process Control Program (PCP)	PCP Control 2.0
G	Offsite Dose Calculation Manual (ODCM)	ODCM (Rev.18) Control 7.2
H	Radioactive Treatment Systems	ODCM (Rev.18) deleted the requirement to report changes.
I	Supplemental Information	Regulatory Guide 1.21
J	Sewage Sludge Disposal	ODCM (Rev.18) Appendix A

2.0 METEOROLOGICAL DATA

Five years of historic meteorological data (1992-1996) collected from the site's 200-foot meteorological tower, located approximately 180 meters north of the vapor container, were used to model the atmospheric dispersion of airborne effluents. The tower instrumentation was designed to meet the requirements of Regulatory Guide 1.23 (Reference 3) for meteorological monitoring. A summary of the 1992-1996 meteorological data is provided in Table 6 of this report.

All gaseous releases are considered to be ground level since the 150-foot primary vent stack was removed during decommissioning.

Atmospheric diffusion was calculated using quarterly historical data along with the recorded quarterly effluent information. CHI/Q and D/Q values were derived for all receptor points using a straight-line airflow model. All dispersion and deposition factors have been calculated employing appropriate source configuration considerations and removal mechanism (e.g., dry deposition) described in Regulatory Guide 1.111 (Reference 4). Terrain elevations, including downwind valley flow corrections for the surrounding area, were factored into the calculation of CHI/Q and D/Q values at each receptor location.

3.0 DOSE ASSESSMENT

3.1 Doses From Liquid Effluents

Control 3.1 limits doses from liquid effluents to a member of the public to those specified in 10CFR Part 50, Appendix I. These limits are 3 mrem per year (1.5 mrem per quarter) for the total body and 10 mrem per year (5 mrem per quarter) for any organ. By implementing the requirements of 10CFR Part 50, Appendix I, Control 3.1 assures that the release of radioactive material in liquid effluents will be kept "as low as is reasonably achievable."

Exposure pathways that could exist as a result of liquid effluents are fish, direct exposure from river shoreline sedimentation, milk and meat via animal ingestion of the Deerfield River water, and meat, milk, and vegetable pathways via crop irrigation with water withdrawn from the Deerfield River. Drinking water and aquatic invertebrate pathways do not exist downriver of the Yankee Nuclear Power Station at Rowe. The dose analysis for the liquid pathways assumes a dilution based on the monthly average flow at the Sherman Dam.

The whole body and organ doses due to liquid effluents were determined by summing the contributions from all pathways. The whole body and organ doses to a member of the public from liquid effluents are given in Table 4. The estimated quarterly and annual doses due to liquid effluents are well below the 10CFR Part 50, Appendix I dose criteria of Control 3.1.

For 2005, there were no liquid effluent releases from the station during the first quarter, therefore, no corresponding projected dose impact to the public. Liquid effluents releases were recorded during the second, third, and fourth quarters of the year.

3.2 Doses From Noble Gases

In 2003, the last of the potential station sources (spent fuel stored in the SFP) of noble gases was eliminated with the transfer of the spent fuel to dry storage in the ISFSI during the first and second quarters of the year, and the processing and release of the SFP water inventory during the third and fourth quarters of the year. As such, no releases of noble gases occurred in 2005, and no quarterly or annual gamma and beta air doses were calculated.

3.3 Doses From Tritium and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days

ODCM Control 3.5 prior to Revision 18 limited the organ doses to a member of the public from tritium and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the site to areas at and beyond the site boundary to those specified in 10CFR Part 50, Appendix I (7.5 mrem per quarter and 15 mrem per year). By implementing the requirements of 10CFR Part 50, Appendix I, Control 3.5 assures that the releases of tritium and particulates in gaseous effluents will be kept "as low as is reasonably achievable." It should be noted that, due to the permanent shutdown of the

station (last power operation was in October 1991), the Iodine-131 source term has decayed away and no longer has the potential to affect dose assessment.

Airborne particulate releases were calculated for the first and second quarters of 2005 using localized air sample data taken in close proximity to demolition of reactor support and spent fuel pool foundation structures. The third and fourth quarter 2005 postulated airborne activity was projected by conservative assumptions on residual soil and concrete concentrations. These estimates were based on the upper bound potential for the release of residual radioactivity associated with soil and concrete that had been cleared by Final Status Survey (FSS), and was subsequently processed by Thermal Desorption heat treatment for the breakdown of PCB's. Estimated airborne releases of radioactivity were not actually measured.

Exposure pathways that could exist as a result of the release of particulates and tritium to the atmosphere include external irradiation from activity deposited onto the ground surface, inhalation, and ingestion of vegetables, meat, and milk. Dose estimates for 2005 were made at the site boundary, historical nearest resident, nearest vegetable garden, and nearest meat animal in each of the sixteen principle compass directions. Doses were calculated for pathways that were determined by the field survey in the past to represent the local site environment. Conservatively, a vegetable garden is assumed to exist at each milk animal location when the milk pathway is included. Furthermore, the meat pathway is assumed to exist at locations where identified in the past. Meat and milk animals are assumed to receive their entire intake from pasture during the second and third quarters. In fact, there is little to no dairy operations or cattle farms in the local site area.

The organ doses were determined after adding the contributions from all pathways at each location. Doses were calculated for the whole body, GI-tract, bones, liver, kidneys, thyroid, lungs, and skin for adults, teenagers, children, and infants. The maximum estimated quarterly and annual organ doses due to tritium and particulates at any of the off-site receptor locations are reported in Table 4. The doses to all other organs at all other locations for all other age groups are less than the doses reported in Table 4. The estimated organ doses from tritium and particulates in gaseous effluents are well below the 10CFR Part 50, Appendix I dose criteria of Control 3.5.

3.4 Total Dose from Direct External Radiation, Plus Liquid and Gaseous Effluents

The annual total dose or dose commitment to any member of the public due to releases of radioactivity and direct radiation from fixed sources are limited to the EPA's radiation protection standards for the uranium fuel cycle (40CFR190). The dose limits are set to less than or equal to 25 mrem per year to the total body or any organ, except the thyroid, which is limited to less than or equal to 75 mrem per year.

Direct external dose from fixed sources of radioactive materials, such as the on-site ISFSI, was evaluated by comparing the Station's 2005 TLD data for offsite indicator stations versus the control and outer ring (beyond 6 miles) locations. Since there was no distinguishable difference between the indicator measurements at the site boundary or beyond and the control measurements, it was concluded that there is no measurable station-related direct radiation dose for 2005.

Table 5 shows that the total dose to the maximum off-site individual for 2005 is well below the EPA dose limit criteria.

4.0 REFERENCES

1. YNPS Offsite Dose Calculation Manual (ODCM), Revision No. 18, effective date, August 4, 2005.

2. Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Release of Reactor Effluents for the Purpose of Evaluating Compliance With 10CFR Part 50, Appendix I," U.S. Nuclear Regulatory Commission, Office of Standards Development, Revision 1, October 1977.

3. Regulatory Guide 1.23, "On-Site Meteorological Programs (Safety Guide 23)," U.S. Nuclear Regulatory Commission, Office of Standards Development, February 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, Revision 1, October 1977.

TABLE 1A
(Sheet 1 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Gaseous Effluents – Summation of All Releases

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
A. Fission and Activation Gases				
1. Total Release	Ci	Note 1	Note 1	
2. Average Release Rate for Period	µCi/sec	Note 1	Note 1	
3. Percent of Control Limit	%	Note 1	Note 1	
B. Iodines[b]				
C. Particulates				
1. Particulates with Half-lives > 8 days	Ci	2.61E-04	5.07E-04	±3.00E+01
2. Average Release Rate for Period	µCi/sec	3.36E-05	6.44E-05	
3. Percent of Control Limit[c]	%	2.21E-02	5.37E-02	
4. Gross Alpha Radioactivity	Ci	1.34E-07	1.32E-06	
D. Tritium				
1. Total Release	Ci	1.42E-03	3.15E-03	±3.00E+01
2. Average Release Rate for Period	µCi/sec	1.83E-04	4.01E-04	
3. Percent of Control Limit	%	(d)	(d)	

Note 1: There are no fission or activation gases available for discharge.

ND Not detected by local area temporary air particulate sampling.
(a) Noble gas effluents have been deleted due to permanent plant shutdown.
(b) Iodine-131 (and I-133, I-135) data have been deleted. These nuclides have decayed below any practicable level for detection in effluents due to permanent plant shutdown.
(c) Per ODCM Control 3.5, the percentage of the limit is based on the combined dose contribution from iodines, tritium, and particulates with half-lives greater than 8 days. Percent of limits are calculated using ODCM Method II dose equations (Revision 17 to ODCM).
(d) Per ODCM Control 3.5, percentage dose contribution from tritium is included in Part C.3.

TABLE 1A
(Sheet 2 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Gaseous Effluents – Summation of All Releases

	Unit	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and Activation Gases				
1. Total Release	Ci	Note 1	Note 1	
2. Average Release Rate for Period	µCi/sec	Note 1	Note 1	
3. Percent of Control Limit[a]	%	Note 1	Note 1	
B. Iodines[b]				
C. Particulates (Note 2)				
1. Particulates with Half-lives > 8 days	Ci	2.95E-07	1.79E-08	±3.00E+01
2. Average Release Rate for Period	µCi/sec	3.71E-08	2.28E-09	
3. Percent of Control Limit[c]	%	1.17E-03	3.35E-06	
4. Gross Alpha Radioactivity	Ci	ND	-	
D. Tritium (Note 2)				
1. Total Release	Ci	3.20E-02	-	±3.00E+01
2. Average Release Rate for Period	µCi/sec	4.03E-03	-	
3. Percent of Control Limit	%	(d)	(d)	

Note 1: There are no fission or activation gases available for discharge.
Note 2: Releases of tritium and particulates in air were projected by calculation and conservative assumptions based on upper bound potential for residual radioactivity associated with soil and concrete cleared by Final Status Survey (FSS), being released in air as a result of treatment by Thermal Desorption for breakdown of PCB's. Airborne releases not actually measured.

ND Not detected by local area temporary air particulate sampling.
(a) Noble gas effluents have been deleted due to permanent plant shutdown.
(b) Iodine-131 (and I-133, I-135) data have been deleted. These nuclides have decayed below any practicable level for detection in effluents due to permanent plant shutdown.
(c) Per ODCM Control 3.5, the percentage of the limit is based on the combined dose contribution from iodines, tritium, and particulates with half-lives greater than 8 days. Percent of limits are calculated using ODCM Method II dose equations (Revision 17 to ODCM).
(d) Per ODCM Control 3.5, percentage dose contribution from tritium is included in Part C.3.
- Dash indicates no release of this type.

TABLE 1B
(Sheet 1 of 1)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Gaseous Effluents – Elevated Releases

The primary vent stack was removed from service on February 3, 2004, with no recorded effluents for 2004 prior to its abandonment. As a result, there is no longer an elevated gaseous release path.

TABLE 1C
(Sheet 1 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Gaseous Effluents – Ground Level Releases

		Continuous Mode		Batch Mode[a]	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Iodines[b]					
2. Particulates					
Strontium-90	Ci	7.71E-07	4.43E-07	-	-
Cesium-134	Ci	8.36E-10	8.36E-10	-	-
Cesium-137	Ci	2.20E-05	1.27E-05	-	-
Cobalt-60	Ci	7.73E-06	1.03E-04	-	-
Iron-55	Ci	8.83E-06	9.86E-05	-	-
Nickel-63	Ci	5.59E-06	7.39E-05	-	-
Plutonium-238	Ci	2.25E-09	4.25E-08	-	-
Plutonium-239, 240	Ci	5.48E-09	1.78E-08	-	-
Plutonium-241	Ci	1.36E-07	3.89E-07	-	-
Americium-241	Ci	5.44E-09	1.53E-08	-	-
Curium-243, 244	Ci	9.94E-09	1.97E-08	-	-
Silver-108M	Ci	ND	2.32E-07	-	-
Antimony-125	Ci	ND	1.56E-06	-	-
Carbon-14	Ci	2.16E-04	2.16E-04	-	-
Total for Period	Ci	2.61E-04	5.07E-04	-	-

ND Not detected by local area temporary air particulate sampling.

(a) There are no longer any batch mode gaseous releases.

(b) Iodine-131, I-133 and I-135 data have been deleted. These nuclides have decayed below any practicable level for detection in effluents due to permanent plant shutdown.

\- Dash indicates no release of this type.

TABLE 1C
(Sheet 2 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Gaseous Effluents – Ground Level Releases

		Continuous Mode		Batch Mode[a]	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
3. Iodines[b]					
4. Particulates *					
Strontium-90	Ci	-	-	-	-
Cesium-134	Ci	-	-	-	-
Cesium-137	Ci	2.31E-07	1.40E-08	-	-
Cobalt-60	Ci	6.41E-08	3.88E-09	-	-
Iron-55	Ci	-	-	-	-
Nickel-63	Ci	-	-	-	-
Plutonium-238	Ci	-	-	-	-
Plutonium-239, 240	Ci	-	-	-	-
Plutonium-241	Ci	-	-	-	-
Americium-241	Ci	-	-	-	-
Curium-243, 244	Ci	-	-	-	-
Silver-108M	Ci	-	-	-	-
Antimony-125	Ci	-	-	-	-
Total for Period	Ci	2.95E-07	1.79E-08	-	-

* Note: Releases estimated by calculation and conservative assumptions on upper bound of potential residual radioactivity associated with soil and concrete cleared by Final Status Survey (FSS), with subsequent treatment by Thermal Desorption for breakdown of PCB's.

ND Not detected by local area temporary air particulate sampling.
(a) There are no longer any batch mode gaseous releases.
(b) Iodine-131, I-133 and I-135 data have been deleted. These nuclides have decayed below any practicable level for detection in effluents due to permanent plant shutdown.
\- Dash indicates no release of this type.

TABLE 2A
(Sheet 1 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Liquid Effluents – Summation of All Releases

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
A. Fission and Activation Products				
1. Total Release (not including tritium, gases, alpha)	Ci	-	1.16E-05	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	-	3.88E-08	
3. Percent of Applicable Limit[a]	%	-	1.06E-01	
B. Tritium				
1. Total Release	Ci	-	7.98E-03	±1.00E+01
2. Average Diluted Concentration During Period	µCi/ml	-	2.67E-05	
3. Percent of Applicable Limit[a]	%	-	8.90E-01	
C. Dissolved and Entrained Gases				
1. Total Release	Ci	-	-	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	-	-	
3. Percent of Applicable Limit[b]	%	-	-	
D. Gross Alpha Radioactivity				
1. Total Release	Ci	-	ND	±3.50E+01
E. Volume of Waste Release (prior to dilution)	Liters	0	2.99E+05	±1.00E+01
F. Volume of Dilution Water Used During Period	Liters	0	0	±1.50E+01

ND Not detected in liquid effluents.
(a) Concentration limits specified in Appendix B to 10CFR20.1-20.602, Table II, Column 2 (ODCM Control 2.1). The percent of applicable limit reported is based on the average diluted concentration during the period. At no time did any release exceed the concentration limit.
(b) The percent of applicable limit reported is based on the average diluted concentration during the period. At no time did any release exceed the concentration limit.
Dash indicates no release of this type.

TABLE 2A
(Sheet 2 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Liquid Effluents – Summation of All Releases

	Unit	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and Activation Products				
1. Total Release (not including tritium, gases, alpha)	Ci	6.56E-07	ND	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	7.62E-10	-	
3. Percent of Applicable Limit[a]	%	2.54E-03	-	
B. Tritium				
1. Total Release	Ci	1.04E-02	2.12E-04	±1.00E+01
2. Average Diluted Concentration During Period	µCi/ml	1.21E-05	2.80E-06	
3. Percent of Applicable Limit[a]	%	4.03E-01	9.33E-02	
C. Dissolved and Entrained Gases				
1. Total Release	Ci	-	-	±2.00E+01
2. Average Diluted Concentration During Period	µCi/ml	-	-	
3. Percent of Applicable Limit[b]	%	-	-	
D. Gross Alpha Radioactivity				
1. Total Release	Ci	ND	ND	±3.50E+01
E. Volume of Waste Release (prior to dilution)	Liters	8.61E+05	7.57E+04	±1.50E+01
F. Volume of Dilution Water Used During Period	Liters	0	0	±1.50E+01

ND Not detected in liquid effluents.
(a) Concentration limits specified in Appendix B to 10CFR20.1-20.602, Table II, Column 2 (ODCM Control 2.1). The percent of applicable limit reported is based on the average diluted concentration during the period. At no time did any release exceed the concentration limit.
(b) The percent of applicable limit reported is based on the average diluted concentration during the period. At no time did any release exceed the concentration limit.
\- Dash indicates no release of this type.

TABLE 2B
(Sheet 1 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Liquid Effluents – Routine Releases

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
Strontium-90	Ci	-	-	-	ND
Cesium-134	Ci	-	-	-	ND
Cesium-137	Ci	-	-	-	2.45E-06
Cobalt-60	Ci	-	-	-	9.18E-06
Iron-55	Ci	-	-	-	ND
Unidentified	Ci	-	-	-	ND
Total for Period (above)	Ci	-	-	-	1.16E-05

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

TABLE 2B
(Sheet 2 of 2)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Liquid Effluents – Routine Releases

		Continuous Mode		Batch Mode	
Nuclides Released	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
Strontium-90	Ci	-	-	ND	ND
Cesium-134	Ci	-	-	ND	ND
Cesium-137	Ci	-	-	ND	ND
Cobalt-60	Ci	-	-	6.56E-07	ND
Iron-55	Ci	-	-	ND	ND
Silver-108M	Ci	-	-	ND	ND
Unidentified	Ci	-	-	ND	ND
Total for Period (above)	Ci	-	-	6.56E-07	ND

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

TABLE 3
(Sheet 1 of 4)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments

I. First and Second Quarters

A. SOLID WASTE SHIPPED FOR BURIAL OR DISPOSAL (not irradiated fuel)

1. Type of Waste	Unit	6-month Period	Est. Total Error, %
a. Dry Active Waste: (D & D Composite Waste: demolition rubble, compactable trash, noncompactable trash) Class A Container: metal boxes (intermodal, sealand, gondola)	m^3 Ci (est.)	8.4E+03 1.67	25
b. Soil : Class A Container: metal boxes (B-25 metal box, drums)	m^3 Ci (est.)	19.3 1.04E-04	25

2. Estimate of Nuclide Composition > 1% (by type of waste)

a.	Hydrogen-3 (tritium)	%	11.6
	Iron-55	%	40.1
	Cobalt-60	%	17.5
	Nickel-63	%	21.3
	Cesium-137	%	6.5
	Carbon-14	%	1.0

b.	Cobalt-60	%	48.4
	Silver-108m	%	18.4
	Cesium-137	%	33.2

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
76	Truck/rail	Envirocare, Clive, Utah
1	Truck	Envirocare, Clive, Utah
8	Truck	Duratek, Inc, Bear Creek, TN
13	Truck/Rail	RACE, LLC,Memphis, TN

TABLE 3
(Sheet 2 of 4)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments

I. First and Second Quarters (continued)

B. IRRADIATED FUEL SHIPMENTS (Disposition): None

TABLE 3
(Sheet 3 of 4)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments

II. Third and Fourth Quarters

A. SOLID WASTE SHIPPED FOR BURIAL OR DISPOSAL (not irradiated fuel)

1. Type of Waste	Unit	6-month Period	Est. Total Error, %
a. Dry Active Waste: (D & D Composite Waste: demolition rubble, compactable trash, noncompactable trash) Class A Container: metal boxes (intermodal, B-25, gondola, sealand)	m^3 Ci (est.)	1.09E+04 5.08	25

2. Estimate of Nuclide Composition > 1% (by type of waste)

a. Hydrogen-3 (tritium)	%	3.6
Iron-55	%	62.5
Cobalt-60	%	21.3
Nickel-63	%	8.9
Cesium-137	%	2.3

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
149	Truck/rail	Envirocare, Clive, Utah
4	Truck	Envirocare, Clive, Utah
1	Truck	Duratek, Inc., Bear Creek, TN

TABLE 3
(Sheet 4 of 4)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments

II. Third and Fourth Quarters (continued)

B. IRRADIATED FUEL SHIPMENTS (Disposition): None

TABLE 4
(Sheet 1 of 1)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Maximum [a] Off-Site Doses and Dose Commitments to Members of the Public[b]

Source	Unit	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year[c]
1. Liquid Effluents						
Whole Body	mrem	0 [d]	2.81E-05[e]	9.52E-06[f]	5.63E-08[f]	3.77E-05
Critical Organ	mrem	0 [d]	5.30E-05[g]	9.54E-06[h]	5.63E-08[i]	6.26E-05
2. Airborne Effluents						
Tritium and Particulates (Max Organ)	mrem	1.66E-03[j]	4.03E-03[j]	8.81E-05[k]	2.51E-07 [j]	5.78E-03
Noble Gases (Beta Air)	mrad	0 [l]	0 [l]	0 [l]	0 [l]	0 [l]
Noble Gases (Gamma Air)	mrad	0 [l]	0 [l]	0 [l]	0[l]	0 [l]
3. Direct Dose						
Direct External Dose	mrem	0 [m]	0 [m]	0 [m]	0 [m]	0 [m]

(a) "Maximum" means the largest fraction of corresponding 10 CFR Part 50, Appendix I, design dose objective.
(b) The numbered footnotes indicate the location of the dose receptor, age group, and organ, where appropriate.
(c) "Maximum" dose for the year is the sum of the maximum doses for each quarter. This results in a conservative yearly dose estimate, but still within the limits of 10 CFR Part 50.
(d) There were no liquid releases during the first quarter of 2005.
(e) Critical age group: Adult.
(f) Critical age group: Child
(g) Maximum organ/age group: Liver/child.
(h) Maximum organ/age group: GI-LLI/child.
(i) Maximum organ/age group: Liver, kidney, lung, GI-LLI, and thyroid of a child
(j) SW & WSW, 1300 meters: Bone of Child
(k) SW & WSW, 1300 meters: Liver of Child
(l) There were no releases of noble gases in 2005.
(m) 2005 TLD data for off-site (site boundary) indicator stations and control / outer ring (beyond 6 miles) stations were compared. No statistical difference which could be attributed to station sources was identified.

TABLE 5
(Sheet 1 of 1)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
Total Dose to Maximum Off-Site Individual (40CFR190)

Pathway	Total Body (mrem)	Maximum Organ[a] (mrem)
Direct External	0.0	0.0
Liquids	3.77E-05	6.26E-05
Airborne	7.40E-04	5.78E-03
Annual Total	7.78E-04	5.84E-03

(a) Maximum organ includes consideration of the thyroid.

TABLE 6
(Sheet 1 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

1. 199.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = .09

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	4
(1)	.00	.00	2.56	5.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.56	.00	10.26
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
4-7	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	2.56	.00	5.13	.00	.00	.00	.00	.00	.00	.00	7.69
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
8-12	0	1	0	0	0	0	0	0	2	3	13	6	1	0	0	0	0	26
(1)	.00	2.56	.00	.00	.00	.00	.00	.00	5.13	7.69	33.33	15.38	2.56	.00	.00	.00	.00	66.67
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.03	.01	.00	.00	.00	.00	.00	.06
13-18	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	6
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	12.82	2.56	.00	.00	.00	.00	.00	15.38
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	0	1	1	2	0	0	0	1	2	5	18	7	1	0	0	1	0	39
(1)	.00	2.56	2.56	5.13	.00	.00	.00	2.56	5.13	12.82	46.15	17.95	2.56	.00	.00	2.56	.00	100.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.04	.02	.00	.00	.00	.00	.00	.09

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

TABLE 6
(Sheet 2 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

2. 199.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = .36

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5
(1)	.68	.68	.68	.68	.68	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.42
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
4-7	1	0	0	0	0	0	0	2	11	5	6	3	1	0	0	0	0	29
(1)	.68	.00	.00	.00	.00	.00	.00	1.37	7.53	3.42	4.11	2.05	.68	.00	.00	.00	.00	19.86
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.03	.01	.01	.01	.00	.00	.00	.00	.00	.07
8-12	0	1	0	0	0	0	0	3	6	14	49	20	0	0	0	0	0	93
(1)	.00	.68	.00	.00	.00	.00	.00	2.05	4.11	9.59	33.56	13.70	.00	.00	.00	.00	.00	63.70
(2)	.00	.00	.00	.00	.00	.00	.00	.01	.01	.03	.12	.05	.00	.00	.00	.00	.00	.23
13-18	0	1	0	0	0	0	0	0	0	0	12	6	0	0	0	0	0	19
(1)	.00	.68	.00	.00	.00	.00	.00	.00	.00	.00	8.22	4.11	.00	.00	.00	.00	.00	13.01
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.01	.00	.00	.00	.00	.00	.05
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	2	3	1	1	1	0	0	5	17	19	67	29	1	0	0	0	0	146
(1)	1.37	2.05	.68	.68	.68	.00	.00	3.42	11.64	13.01	45.89	19.86	.68	.00	.00	.00	.00	100.00
(2)	.00	.01	.00	.00	.00	.00	.00	.01	.04	.05	.16	.07	.00	.00	.00	.00	.00	.36

(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 6
(Sheet 3 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

3. 199.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 1.24

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1	1	5	3	0	0	0	1	1	0	0	0	0	0	1	0	0	13
(1)	.20	.20	.98	.59	.00	.00	.00	.20	.20	.00	.00	.00	.00	.00	.20	.00	.00	2.55
(2)	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
4-7	0	3	2	0	1	3	2	17	24	21	22	16	6	3	1	0	0	121
(1)	.00	.59	.39	.00	.20	.59	.39	3.33	4.71	4.12	4.31	3.14	1.18	.59	.20	.00	.00	23.73
(2)	.00	.01	.00	.00	.00	.01	.00	.04	.06	.05	.05	.04	.01	.01	.00	.00	.00	.29
8-12	1	4	1	0	0	0	2	7	17	42	122	107	10	2	1	2	0	318
(1)	.20	.78	.20	.00	.00	.00	.39	1.37	3.33	8.24	23.92	20.98	1.96	.39	.20	.39	.00	62.35
(2)	.00	.01	.00	.00	.00	.00	.00	.02	.04	.10	.30	.26	.02	.00	.00	.00	.00	.77
13-18	2	2	0	0	0	0	0	0	1	4	20	27	2	0	0	0	0	58
(1)	.39	.39	.00	.00	.00	.00	.00	.00	.20	.78	3.92	5.29	.39	.00	.00	.00	.00	11.37
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.05	.07	.00	.00	.00	.00	.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	4	10	8	3	1	3	4	25	43	67	164	150	18	5	3	2	0	510
(1)	.78	1.96	1.57	.59	.20	.59	.78	4.90	8.43	13.14	32.16	29.41	3.53	.98	.59	.39	.00	100.00
(2)	.01	.02	.02	.01	.00	.01	.01	.06	.10	.16	.40	.36	.04	.01	.01	.00	.00	1.24

(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 6
(Sheet 4 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

4. 199.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 46.68

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	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	299	588	303	121	89	87	85	80	81	132	224	161	97	79	99	124	0	2649
(1)	1.56	3.07	1.58	.63	.46	.45	.44	.42	.42	.69	1.17	.84	.51	.41	.52	.65	.00	13.81
(2)	.73	1.43	.74	.29	.22	.21	.21	.19	.20	.32	.55	.39	.24	.19	.24	.30	.00	6.45
4-7	786	1407	437	174	174	183	237	322	561	795	1107	761	509	358	376	454	0	8641
(1)	4.10	7.33	2.28	.91	.91	.95	1.24	1.68	2.92	4.14	5.77	3.97	2.65	1.87	1.96	2.37	.00	45.05
(2)	1.91	3.42	1.06	.42	.42	.45	.58	.78	1.36	1.93	2.69	1.85	1.24	.87	.91	1.10	.00	21.02
8-12	935	1264	163	35	37	32	39	82	162	525	792	942	569	258	241	441	0	6517
(1)	4.87	6.59	.85	.18	.19	.17	.20	.43	.84	2.74	4.13	4.91	2.97	1.34	1.26	2.30	.00	33.97
(2)	2.27	3.08	.40	.09	.09	.08	.09	.20	.39	1.28	1.93	2.29	1.38	.63	.59	1.07	.00	15.86
13-18	216	446	19	3	0	2	1	1	11	39	172	265	68	13	11	47	0	1314
(1)	1.13	2.32	.10	.02	.00	.01	.01	.01	.06	.20	.90	1.38	.35	.07	.06	.25	.00	6.85
(2)	.53	1.09	.05	.01	.00	.00	.00	.00	.03	.09	.42	.64	.17	.03	.03	.11	.00	3.20
19-24	12	28	1	0	0	0	0	0	0	2	5	10	2	0	0	1	0	61
(1)	.06	.15	.01	.00	.00	.00	.00	.00	.00	.01	.03	.05	.01	.00	.00	.01	.00	.32
(2)	.03	.07	.00	.00	.00	.00	.00	.00	.00	.00	.01	.02	.00	.00	.00	.00	.00	.15
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	2248	3733	923	333	300	304	362	485	815	1493	2300	2139	1245	709	727	1067	0	19183
(1)	11.72	19.46	4.81	1.74	1.56	1.58	1.89	2.53	4.25	7.78	11.99	11.15	6.49	3.70	3.79	5.56	.00	100.00
(2)	5.47	9.08	2.25	.81	.73	.74	.88	1.18	1.98	3.63	5.60	5.20	3.03	1.73	1.77	2.60	.00	46.68

(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 6
(Sheet 5 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

5. 199.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 40.08

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	999	2950	1363	527	310	271	231	250	295	401	523	315	191	171	204	309	0	9310
(1)	6.06	17.91	8.27	3.20	1.88	1.65	1.40	1.52	1.79	2.43	3.17	1.91	1.16	1.04	1.24	1.88	.00	56.51
(2)	2.43	7.18	3.32	1.28	.75	.66	.56	.61	.72	.98	1.27	.77	.46	.42	.50	.75	.00	22.65
4-7	455	2014	392	83	66	59	74	168	242	501	730	340	172	92	151	164	0	5703
(1)	2.76	12.23	2.38	.50	.40	.36	.45	1.02	1.47	3.04	4.43	2.06	1.04	.56	.92	1.00	.00	34.62
(2)	1.11	4.90	.95	.20	.16	.14	.18	.41	.59	1.22	1.78	.83	.42	.22	.37	.40	.00	13.88
8-12	121	331	52	2	1	4	2	17	38	238	176	122	55	22	22	33	0	1236
(1)	.73	2.01	.32	.01	.01	.02	.01	.10	.23	1.44	1.07	.74	.33	.13	.13	.20	.00	7.50
(2)	.29	.81	.13	.00	.00	.01	.00	.04	.09	.58	.43	.30	.13	.05	.05	.08	.00	3.01
13-18	16	64	7	2	0	0	0	0	4	40	37	26	6	0	1	4	0	207
(1)	.10	.39	.04	.01	.00	.00	.00	.00	.02	.24	.22	.16	.04	.00	.01	.02	.00	1.26
(2)	.04	.16	.02	.00	.00	.00	.00	.00	.01	.10	.09	.06	.01	.00	.00	.01	.00	.50
19-24	0	7	0	0	0	0	0	0	0	0	9	2	0	0	0	0	0	18
(1)	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.05	.01	.00	.00	.00	.00	.00	.11
(2)	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.04
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	1591	5366	1814	614	377	334	307	435	579	1180	1475	805	424	285	378	510	0	16474
(1)	9.66	32.57	11.01	3.73	2.29	2.03	1.86	2.64	3.51	7.16	8.95	4.89	2.57	1.73	2.29	3.10	.00	100.00
(2)	3.87	13.06	4.41	1.49	.92	.81	.75	1.06	1.41	2.87	3.59	1.96	1.03	.69	.92	1.24	.00	40.08

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

TABLE 6
(Sheet 6 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

6. 199.0 FT WIND DATA STABILITY CLASS F CLASS FREQUENCY (PERCENT) = 8.76

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	156	433	448	220	148	132	112	86	105	133	152	99	92	50	71	83	0	2520
(1)	4.33	12.02	12.44	6.11	4.11	3.67	3.11	2.39	2.92	3.69	4.22	2.75	2.55	1.39	1.97	2.30	.00	69.98
(2)	.38	1.05	1.09	.54	.36	.32	.27	.21	.26	.32	.37	.24	.22	.12	.17	.20	.00	6.13
4-7	69	257	83	27	17	10	25	39	54	100	144	68	38	32	34	26	0	1023
(1)	1.92	7.14	2.30	.75	.47	.28	.69	1.08	1.50	2.78	4.00	1.89	1.06	.89	.94	.72	.00	28.41
(2)	.17	.63	.20	.07	.04	.02	.06	.09	.13	.24	.35	.17	.09	.08	.08	.06	.00	2.49
8-12	4	13	0	0	0	0	0	0	2	6	14	7	4	1	0	0	0	51
(1)	.11	.36	.00	.00	.00	.00	.00	.00	.06	.17	.39	.19	.11	.03	.00	.00	.00	1.42
(2)	.01	.03	.00	.00	.00	.00	.00	.00	.00	.01	.03	.02	.01	.00	.00	.00	.00	.12
13-18	1	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7
(1)	.03	.14	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.19
(2)	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	230	708	531	247	165	142	137	125	161	239	311	174	134	83	105	109	0	3601
(1)	6.39	19.66	14.75	6.86	4.58	3.94	3.80	3.47	4.47	6.64	8.64	4.83	3.72	2.30	2.92	3.03	.00	100.00
(2)	.56	1.72	1.29	.60	.40	.35	.33	.30	.39	.58	.76	.42	.33	.20	.26	.27	.00	8.76

(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 6
(Sheet 7 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

7. 199.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 2.79

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	30	88	83	54	60	41	47	46	44	41	52	31	15	13	16	16	0	677
(1)	2.62	7.68	7.24	4.71	5.24	3.58	4.10	4.01	3.84	3.58	4.54	2.71	1.31	1.13	1.40	1.40	.00	59.08
(2)	.07	.21	.20	.13	.15	.10	.11	.11	.11	.10	.13	.08	.04	.03	.04	.04	.00	1.65
4-7	14	54	27	16	12	9	18	38	26	73	86	29	14	10	10	4	0	440
(1)	1.22	4.71	2.36	1.40	1.05	.79	1.57	3.32	2.27	6.37	7.50	2.53	1.22	.87	.87	.35	.00	38.39
(2)	.03	.13	.07	.04	.03	.02	.04	.09	.06	.18	.21	.07	.03	.02	.02	.01	.00	1.07
8-12	0	3	0	0	0	0	0	0	3	8	8	4	2	0	0	0	0	28
(1)	.00	.26	.00	.00	.00	.00	.00	.00	.26	.70	.70	.35	.17	.00	.00	.00	.00	2.44
(2)	.00	.01	.00	.00	.00	.00	.00	.00	.01	.02	.02	.01	.00	.00	.00	.00	.00	.07
13-18	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00	.09
(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	44	145	110	70	72	50	65	84	73	122	147	64	31	23	26	20	0	1146
(1)	3.84	12.65	9.60	6.11	6.28	4.36	5.67	7.33	6.37	10.65	12.83	5.58	2.71	2.01	2.27	1.75	.00	100.00
(2)	.11	.35	.27	.17	.18	.12	.16	.20	.18	.30	.36	.16	.08	.06	.06	.05	.00	2.79

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

TABLE 6
(Sheet 8 of 8)

Yankee Nuclear Power Station, Rowe, Massachusetts
2005 Annual Radioactive Effluent Release Report
1992-1996 Meteorological Data Joint Frequency Distribution

8. 199.0 FT WIND DATA STABILITY CLASS ALL CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1486	4061	2204	928	608	531	475	463	526	707	951	606	395	313	391	533	0	15178
(1)	3.62	9.88	5.36	2.26	1.48	1.29	1.16	1.13	1.28	1.72	2.31	1.47	.96	.76	.95	1.30	.00	36.93
(2)	3.62	9.88	5.36	2.26	1.48	1.29	1.16	1.13	1.28	1.72	2.31	1.47	.96	.76	.95	1.30	.00	36.93
4-7	1325	3735	941	300	270	264	356	587	918	1497	2095	1217	740	495	572	648	0	15960
(1)	3.22	9.09	2.29	.73	.66	.64	.87	1.43	2.23	3.64	5.10	2.96	1.80	1.20	1.39	1.58	.00	38.83
(2)	3.22	9.09	2.29	.73	.66	.64	.87	1.43	2.23	3.64	5.10	2.96	1.80	1.20	1.39	1.58	.00	38.83
8-12	1061	1617	216	37	38	36	43	109	230	836	1174	1208	641	283	264	476	0	8269
(1)	2.58	3.93	.53	.09	.09	.09	.10	.27	.56	2.03	2.86	2.94	1.56	.69	.64	1.16	.00	20.12
(2)	2.58	3.93	.53	.09	.09	.09	.10	.27	.56	2.03	2.86	2.94	1.56	.69	.64	1.16	.00	20.12
13-18	235	518	26	5	0	2	1	1	16	83	248	325	76	13	12	51	0	1612
(1)	.57	1.26	.06	.01	.00	.00	.00	.00	.04	.20	.60	.79	.18	.03	.03	.12	.00	3.92
(2)	.57	1.26	.06	.01	.00	.00	.00	.00	.04	.20	.60	.79	.18	.03	.03	.12	.00	3.92
19-24	12	35	1	0	0	0	0	0	0	2	14	12	2	0	0	1	0	79
(1)	.03	.09	.00	.00	.00	.00	.00	.00	.00	.00	.03	.03	.00	.00	.00	.00	.00	.19
(2)	.03	.09	.00	.00	.00	.00	.00	.00	.00	.00	.03	.03	.00	.00	.00	.00	.00	.19
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	4119	9966	3388	1270	916	833	875	1160	1690	3125	4482	3368	1854	1105	1239	1709	0	41099
(1)	10.02	24.25	8.24	3.09	2.23	2.03	2.13	2.82	4.11	7.60	10.91	8.19	4.51	2.69	3.01	4.16	.00	100.00
(2)	10.02	24.25	8.24	3.09	2.23	2.03	2.13	2.82	4.11	7.60	10.91	8.19	4.51	2.69	3.01	4.16	.00	100.00

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APPENDIX A

Radioactive Liquid Effluent Monitoring Instrumentation

The requirements governing the operability of radioactive liquid effluent monitoring instrumentation were removed from the ODCM (Control 5.1) with the implementation of Revision 18 to the ODCM. The plant-installed processing pathway with its associated monitor was abandoned on July 21, 2004, as part of decommissioning activities.

APPENDIX B

Radioactive Gaseous Effluent Monitoring Instrumentation

The requirements of ODCM governing the operability of radioactive gaseous effluent monitoring instrumentation were removed from the ODCM per Revision 17 to the ODCM in 2004 with the removal of the primary vent stack from service on February 3, 2004, as part of station decommissioning.

APPENDIX C

Liquid Holdup Tanks

Requirement: The Yankee Decommissioning Quality Assurance Program (YDQAP), Appendix D, Section H, limits the quantity of radioactive material contained in any outside temporary tank. With the quantity of radioactive material in any outside temporary tank exceeding the limits of the YDQAP, a description of the events leading to this condition is required in the next Annual Radioactive Effluent Release Report.

Response: *The limits of the Yankee Decommissioning Quality Assurance Program were not exceeded during this reporting period.*

APPENDIX D

Radiological Environmental Monitoring Program

Requirement: The Radiological Environmental Monitoring Program is conducted in accordance with ODCM Control 4.1. With the Radiological Environmental Monitoring Program not being conducted as specified in Table 4.1, ODCM Control 4.1 requires a description of the reasons for not conducting the program as required and that plans for preventing a recurrence be included in the next Annual Radioactive Effluent Report.

Response: *The requirements of ODCM, Control 4.1, governing the conduction of the REMP were met for this reporting period.*

APPENDIX E

Land Use Census

Revision 18 to the ODCM (implemented in August, 2005) eliminated the need to perform an annual land use census as a result of the removal of the last significant airborne effluent release sources due to site decommissioning activities. No land use census was therefore conducted in 2005.

APPENDIX F

Process Control Program (PCP)

Requirement: PCP Control 2.0 requires that licensee-initiated changes to the 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 to the PCP during the reporting period.*

APPENDIX G

Off-Site Dose Calculation Manual (ODCM)

Requirement: ODCM Control 7.2 requires that licensee-initiated changes to the 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: *Revision 18 to the ODCM was approved for implementation on August 4, 2005. These licensee-initiated changes that make-up Revision 18 include:*

1. *Elimination of airborne release pathway assessments and dose consequence calculation requirements following completion of site demolition activities for buildings and structures that had a history of radioactive material contamination, thereby removing the airborne effluent potential (dust or resuspended particulates).*

2. *Reduction in REMP sampling to eliminate airborne pathways (i.e., air sampling, food product collection, and outer area TLD monitoring) due to the elimination of the airborne effluent potential.*

3. *Elimination of annual requirement for the performance of a Land Use Census as a result of the removal of airborne effluent potential.*

4. *Elimination of liquid effluent monitoring/sampling requirements associated with process pathways and discharge points that no longer exist due to decommissioning activities.*

5. *Minor editorial changes to consolidate the pages of the report, eliminate reference to materials and terminology no longer included in the ODCM, or update references to supporting materials.*

The need for gaseous dose and set-point equations and methodology, along with the need for environmental monitoring of airborne pathways, have been eliminated from the ODCM as a direct result of potentially significant airborne radioactivity source terms being eliminated from the site due to the completion of plant dismantlement (demolition) activities of potentially contaminated structures. The removal of all original plant liquid effluent control equipment has also removed the need to maintain ODCM controls previously associated with that equipment. In addition, no new or different type of effluent release condition has been created. Therefore, the proposed changes to the ODCM will maintain the level of radioactive effluent control required by 10CFR20.106 (10CFR20.1301), 40CFR190, 10CFR50.36a, and Appendix I to 10CFR50 and not adversely impact the accuracy or reliability of effluent, dose, or set-point calculations that still remain (i.e., those associated with potential radioactive liquid effluent releases).

APPENDIX H

Radioactive Waste Treatment Systems

Requirement: ODCM Control 7.3 and PCP Control 3.0 require that licensee-initiated major changes to the radioactive waste systems 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: *As part of decommissioning, the liquid waste evaporation processing system was permanently secured from operation on June 1, 2004. The primary vent stack gaseous treatment system was secured from operation on February 3, 2004.*

Control 7.3 of the ODCM was deleted as part of Revision 18 to the ODCM

APPENDIX I

Supplemental Information

1. Control Limits – Dose and Dose Rate

Control and Category	Limit
a. Noble Gases	
Control 3.3, Total Body Dose Rate	Deleted
Control 3.3, Skin Dose Rate	Deleted
Control 3.4, Gamma Air Dose	Deleted
Control 3.4, Gamma Air Dose	Deleted
Control 3.4, Beta Air Dose	Deleted
Control 3.4, Beta Air Dose	Deleted
b. Iodine-131, Tritium, and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days	
Control 3.3, Organ Dose Rate	1500 mrem/year
Control 3.5, Organ Dose	7.5 mrem/quarter
Control 3.5, Organ Dose	15 mrem/year
c. Liquids	
Control 3.1, Total Body Dose	1.5 mrem/quarter
Control 3.1, Total Body Dose	3 mrem/year
Control 3.1, Organ Dose	5 mrem/quarter
Control 3.1, Organ Dose	10 mrem/year

2. Control Limits – Concentration

Control and Category	Limit
a. Liquids	
Control 2.1, Total Sum of the Fraction of MPC (10CFR20, Appendix B, Table II, Column 2), excluding Noble Gases less than:	1.0
Control 2.1, Total Noble Gas Concentration	Deleted

3. Measurements and Approximations of Total Radioactivity

a. Iodines, Particulates

There are no longer any iodine isotopes available for discharge. The original installed airborne effluent sampling system was installed on the plant vent stack which was taken out of service on February 3, 2004. Temporary local area air particulate samplers are used during building demolition to confirm minimal dust borne releases due to building dismantlement. The errors associated with the determination of particulate effluents were estimated to be ±30 percent.

b. Liquid Effluents

A gamma isotopic analysis is performed on a representative sample using a Marinelli Beaker geometry for each batch discharge. Composite sample discharges are analyzed for Strontium-90, Iron-55 and gross alpha activity.

Tritium analysis is performed on a representative sample for each batch discharge. The errors associated with these measurements are as follows: fission and activation products, ±20 percent; tritium, ±10 percent; and alpha activity, ±35 percent.

4. Batch Releases

a. Liquids

First Quarter	Routine Releases
Number of batch releases	0
Total time period for batch releases (minutes)	-
Maximum time period for a batch release (minutes)	-
Average time period for batch releases (minutes)	-
Minimum time period for a batch release (minutes)	-
Average stream flow (Sherman Dam) during period (cfs)	858
Average discharge rate (gpm)	-

Second Quarter	Routine Releases
Number of batch releases	4
Total time period for batch releases (minutes)	1710
Maximum time period for a batch release (minutes)	750
Average time period for batch releases (minutes)	427
Minimum time period for a batch release (minutes)	210
Average stream flow (Sherman Dam) during period (cfs)	606
Average discharge rate (gpm)	46

Third Quarter	Routine Releases
Number of batch releases	12
Total time period for batch releases (minutes)	10,054
Maximum time period for a batch release (minutes)	1,935
Average time period for batch releases (minutes)	838
Minimum time period for a batch release (minutes)	240
Average stream flow (Sherman Dam) during period (cfs)	294
Average discharge rate (gpm)	23

Fourth Quarter	Routine Releases
Number of batch releases	1
Total time period for batch releases (minutes)	315
Maximum time period for a batch release (minutes)	315
Average time period for batch releases (minutes)	315
Minimum time period for a batch release (minutes)	315
Average stream flow (Sherman Dam) during period (cfs)	900
Average discharge rate (gpm)	64

b. Gases

There are no longer any batch-mode gaseous releases associated with station systems.

5. Abnormal Releases

ODCM Control 7.2 requires the reporting of any unplanned releases from the site to the site boundary of radioactive material in gaseous and liquid effluents made during the reporting period.

a. Liquid

There were no non-routine liquid releases during the reporting period.

b. Gases

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

APPENDIX J

Sewage Sludge Disposal

Requirement: ODCM, Appendix A requires that for periods in which disposal of septage occurs, the licensee shall report in the Annual Radioactive Effluent Release Report, the volume discharged, liquid and solid fractions, and total activity discharged.

Response: *There was one sewage disposal shipment (February 22) made in 2005.*

Volume discharged: 6,500 gallons
Liquid fraction (by weight) of waste: 0.835
Solid fraction (by weight) of waste: 0.165
Nuclide content in liquid fraction (µCi/gm): ND [a]
Nuclide content in solid fraction :

Cs-137 = 8.25E-08 µCi/gm (wet)
Co-60 = 4.81E-07 µCi/gm
Ni-63 = 1.25E-06 µCi/gm

Total radioactivity discharged:

Cs-137 = 3.35 E-01 µCi
Co-60 = 1.95 E+00 µCi
Ni-63 = 5.07 E+00 µCi
Total : 7.36 E+00 µCi

(a) Not Detected