ENCLOSURE (1)

CALVERT CLIFFS NUCLEAR POWER PLANT

EFFLUENT AND WASTE DISPOSAL

2006 ANNUAL REPORT

Calvert Cliffs Nuclear Power Plant, Inc.
July 11, 2007

Facility - Calvert Cliffs Nuclear Power Plant

Licensee – Calvert Cliffs Nuclear Power Plant, Inc.

I. REGULATORY LIMITS

A. Fission and Activation Gases

1. The instantaneous release rate of noble gases in gaseous effluents shall not result in a site boundary dose rate greater than 500 mRem/year to the whole body or greater than 3000 mRem/year to the skin (Offsite Dose Calculation Manual (ODCM) 3.11.2.1).

2. Gaseous Radwaste Treatment System and the Ventilation Exhaust Treatment System shall be used to reduce gaseous emissions when the calculated gamma-air dose due to gaseous effluents exceeds 1.20 mRad or the calculated beta-air dose due to gaseous effluents exceeds 2.4 mRad at the site boundary in a 92 day period (ODCM 3.11.2.4).

3. The air dose at the site boundary due to noble gases released in gaseous effluents shall not exceed (ODCM 3.11.2.2):

   10 mRad/qtr, gamma-air
   20 mRad/qtr, beta-air
   20 mRad/year, gamma-air
   40 mRad/year, beta-air

4. All of the above parameters are calculated according to the methodology specified in the ODCM.

B. Iodines and Particulates with Half Lives Greater than Eight Days

1. The instantaneous release rate of iodines and particulates in gaseous effluents shall not result in a site boundary dose-rate in excess of 1500 mRem/year to any organ (ODCM 3.11.2.1).

2. The Gaseous Radwaste Treatment System and the Ventilation Exhaust Treatment System shall be used to reduce radioactive materials in gaseous effluents when calculated doses exceed 1.8 mRem to any organ in a 92 day period at or beyond the site boundary (ODCM 3.11.2.4).

3. The dose to a member of the public at or beyond the site boundary from iodine-131 and particulates with half lives greater than eight days in gaseous effluents shall not exceed (ODCM 3.11.2.3):

   15 mRem/qtr, any organ
   30 mRem/year, any organ
   less than 0.1% of the above limits as a result of burning contaminated oil.

4. All of the above parameters are calculated according to the methodology specified in the ODCM.

C. Liquid Effluents

1. The concentrations of radionuclides in liquid effluents from the plant shall not exceed the values specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for unrestricted areas (ODCM 3.11.1.1).

2. The liquid radwaste treatment system shall be used to reduce the concentration of radionuclides in liquid effluents from the plant when the calculated dose to unrestricted areas exceeds 0.36 mRem to the whole body, or 1.20 mRem to any organ in a 92 day period (ODCM 3.11.1.3).

3. The dose to a member of the public in unrestricted areas shall not exceed (ODCM 3.11.1.2):

   3 mRem/qtr, total body
   10 mRem/qtr, any organ
   6 mRem/year, total body
   20 mRem/year, any organ

4. All of the liquid dose parameters are calculated according to the methodology specified in the ODCM.

II. MAXIMUM PERMISSIBLE CONCENTRATIONS

A. Fission and Activation Gases

Prior to the batch release of gaseous effluents, a sample of the source is collected and analyzed by gamma spectroscopy for the principal gamma emitting radionuclides. The identified radionuclide concentrations are evaluated and an acceptable release rate is determined to ensure that the dose rate limits of ODCM 3.11.2.1 are not exceeded.

B. Iodines and Particulates with Half Lives Greater than Eight Days

Compliance with the dose rate limitations for iodines and particulates is demonstrated by analysis of the charcoal and particulate samples of the station main vents. The charcoal samples are analyzed by gamma spectroscopy for quantification of radioiodines. The particulate samples are analyzed by gamma spectroscopy for quantification of particulate radioactive material. All of the above parameters are calculated according to the methodology specified in the ODCM.

C. Liquid Effluents

The Maximum Permissible Concentrations (MPCs) used for radioactive materials released in liquid effluents are in accordance with ODCM 3.11.1.1 and the values from 10 CFR Part 20, Appendix B, Table II, Column 2 including applicable table notes. In all cases, the more restrictive (lower) MPC found for each radionuclide is used regardless of solubility.

III. TECHNICAL SPECIFICATION REPORTING REQUIREMENTS

A. Calvert Cliffs Nuclear Power Plant (CCNPP), Technical Specification 5.6.3

1. 2006 Dose Assessment Summary

	Actual Value	Percent of ODCM limit	ODCM Limit
Liquid Waste:			
Maximum Annual Organ Dose (mRem) [1]	0.0059	0.03%	20
Maximum Whole Body Dose (mRem)	0.0024	0.04%	6
Gaseous Waste: Noble Gases:			
Maximum Quarterly Gamma Air Dose (mRad)	0.012	0.12%	10
Maximum Quarterly Beta Air Dose (mRad)	0.046	0.23%	20
Iodines and Particulates:			
Maximum Annual Organ Dose (mRem) [2]	0.95	3.2%	30

[1] The controlling pathway was the fish and shellfish pathway with adult as the controlling age group and the GI-LLI representing the organ with the highest calculated dose during the calendar year of 2006.

[2] The controlling pathway was the child-infant-thyroid pathway representing the organ with the highest calculated dose during the calendar year of 2006. There is currently no milk pathway.

2. 40 CFR 190 Total Dose Compliance

Based upon the calendar year 2006 and the ODCM calculations, the maximum exposed individual would receive less than 1.3% of the allowable dose. During the calendar year 2006, there were no on-site sources of direct radiation that would have contributed to a significant or measurable off-site dose. The direct radiation contribution is measured by both on-site and off-site thermoluminescent dosimeters (TLDs). The results of these measurements did not indicate any statistical increase in the off-site radiation doses attributable to on-site sources. Therefore, no increase in the calculated offsite dose is attributed to the direct exposure from on-site sources. A more detailed evaluation may be found in the Annual Radiological Environmental Operating Report.

3. Solid Waste Report Requirements

During 2006, the types of radioactive solid waste shipped from Calvert Cliffs were dry compressible waste, spent resins, irradiated components, and cartridge filters which were shipped in either High Integrity Containers (HICs) within NRC approved casks, Sea/Land containers, or steel boxes. Appendix A provides a detailed breakdown of the waste shipments for 2006 per Technical Specification 5.6.3. At CCNPP, methods of waste and materials segregation are used to reduce the volume of solid waste shipped offsite for processing, volume reduction, and burial.

4. Offsite Dose Calculation Manual (ODCM) and Process Control Program (PCP) Changes

The ODCM was not revised during calendar year 2006. The PCP was not revised in 2006.

B. Radioactive Effluent Monitoring Instrumentation

In 2006, the minimum channels operable requirement for the Unit-1 steam generator blowdown radiation monitor was not satisfied for greater than 30 days. Per ODCM 3.3.3.10, Radioactive Liquid Effluents, Action b:

> *"with less than the minimum number of radioactive liquid effluent monitoring instrumentation channels operable, take the action shown in Table 3.3-13. Exert best efforts to return the instruments to operable status within 30 days and, if unsuccessful, explain in the next Annual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner."*

There are two radiation monitors on the Unit-1 steam generator blowdown line: 1-RE-4014 and 1-RE-4095. The ODCM requires that one channel remain operable in accordance with the minimum-channel-operability requirements of the ODCM. Both 1-RE-4014 and 1-RE-4095 were inoperable for all of calendar year 2006, violating the ODCMs minimum-channel-operability requirements. The provisions of Action 29 (ODCM Table 3.3-13) were implemented. Those actions required:

> *"with the number of channels operable less than required by the minimum channels operable requirement, effluent releases via this pathway may continue provided grab samples are analyzed for gross radioactivity (beta or gamma) at the lower limit of detection defined in Table 4.11-1 at least every 48 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcuries/gram dose equivalent I-131."*

Chemistry sampling continues. A similar radiation monitor configuration exists on Unit 2. Although Unit 2 satisfied the ODCMs minimum-channel-operability requirements for all of calendar year 2006, one of the Unit-2 steam generator blowdown monitors, 2-RE-4095, was inoperable for all of calendar year 2006. The Unit-1 and Unit-2 radiation monitors were out of service due to an unavailability of spare parts. Replacements for 1-RE-4095 and 2-RE-4095 should be operational by September 2007.

C. Independent Spent Fuel Storage Installation (ISFSI), ISFSI Technical Specification 6.1

Three (3) casks of spent fuel were transferred to the ISFSI during 2006. No quantity of radionuclides was released to the environment during the ISFSI operation in 2006. Additional information regarding the ISFSI radiation-monitoring program is included in the Annual Radiological Environmental Operation Report.

IV. AVERAGE ENERGY

Not Applicable.

V. MEASUREMENTS AND APPROXIMATIONS AND TOTAL RADIOACTIVITY

A. Fission and Activation Gases

1. Batch Releases

Prior to each batch release of gas from a pressurized waste gas decay tank or containment, a sample is collected and analyzed by gamma spectroscopy using a germanium detector for the principal gamma emitting noble gas radionuclides. The total activity released is based on the pressure/volume relationship (gas laws). The

Plant Vent Stack Radiation Monitor typically monitors containment releases, and the values from the radiation monitor may be used to assist in the calculation of activity discharged from containment during venting.

2. Continuous Releases

A gas sample is collected at least weekly from the main vents and analyzed by gamma spectroscopy using a germanium detector for the principal gamma emitting noble gas radionuclides. The total activity released for the week is based on the total sample activity decay corrected to the sample time multiplied by the main vent flow for the week. The Plant Vent Stack Radiation Monitor continuously measures routine plant vent stack releases, per design, and the values from the radiation monitor may be used to assist in the calculation of activity discharged in routine plant vent stack discharges.

Prior to and after each containment purge, a gas sample is collected and analyzed by gamma spectroscopy using a germanium detector to determine the concentration of principal gamma emitting noble gas radionuclides inside containment. The total activity released is based on containment volume and purge rate. Alternatively, total activity released during a containment purge is based on continuous radiation monitor responses, grab samples, and purge fan flow rate.

A monthly composite sample is collected from the main vents and analyzed by liquid scintillation for tritium. The total tritium release for the month is based on the sample analysis and the main vent flow. There was only one exception to this practice in 2006. The details are outlined below.

During June 2006, the Unit-1 main vent tritium analysis indicated tritium had increased approximately 1 order of magnitude above the highest tritium reported during the previous 16 years. An investigation revealed (1) the plant was operating routinely at steady state power, (2) there were no corresponding increases in plant vent stack noble gas activity, (3) there were no corresponding increases in the releases of iodine, (4) there were no plant transients or unusual discharges during June 2006, (5) there were no waste gas decay tank discharges in June, and (6) the tritium values for the months before and after (May and July) indicated normal results with no adverse trend. The primary source of tritium discharged in gaseous radwaste originates from evaporation of the spent fuel pool water. It is not possible for the order-of-magnitude increase in tritium to have originated from spent fuel pool since evaporation rates are relatively constant. As a result, it was concluded the June 2006 tritium analysis result for the Unit-1 main vent was biased high. Instead of reporting a tritium result that is known to be biased, it was decided to report Unit 1 plant vent stack tritium releases based on tritium results from the adjoining months (May and July). As a result, instead of reporting 9.89E-8 μCi/cc tritium for Unit-1 in June, a value of 1.54E-9 μCi/cc was reported instead. This method of reporting results is consistent with the direction provided Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Waste and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light Water Cooled Nuclear Power Plants," Revision 1, Appendix A, paragraph A.2.a. This also ensures releases of radioactivity from the plant site are accurately reported.

B. Iodine and Particulates

1. Batch Releases

The total activities of radioiodines and particulates released from pressurized waste gas decay tanks, containment purges, and containment vents are accounted for by the continuous samplers on the main vent. During 2006, the Unit-1 containment atmosphere was allowed to vent through the equipment hatch during a period when containment purge was unavailable. For this release, containment was sampled for noble gases, particulates, tritium, and iodine, and a permit was prepared prior to discharge. The activity discharged was based on an estimated discharge flow rate, the containment atmosphere samples, and the duration of the release. This containment atmosphere batch discharge accounted for all the particulates discharged in the second quarter.

2. Continuous Releases

During the release of gas from the main vents, samples of iodines and particulates are collected using a charcoal and particulate filter, respectively. The filters are removed weekly (or more often) and are analyzed by gamma spectroscopy using a germanium detector for significant gamma emitting radionuclides. The total activity released for the week is based on the total sample activity decay corrected to the midpoint of the sample period multiplied by the main vent flow for the week. A plate-out correction factor is applied to the results to account for the amount of iodine lost in the sample lines prior to sample collection. The weekly particulate filters are then composited to form monthly and quarterly composites for the gross alpha and strontium-89 and strontium-90 analyses.

Although charcoal samples are normally analyzed weekly, during containment purges, samples may be collected multiple times in a week to assist in accurately determining iodine releases during refueling outages. Such an increased sampling regime was implemented during the refueling outage in 2006. Because of this practice, a short lived iodine isotope, I-132, was identified on the charcoal sample and is reported herein. Normally, such a short lived nuclide would not be detected using a weekly sampling interval. Fuel failures in 2006 continued to cause iodine releases to be elevated relative to historical average values.

C. Liquid Effluents

1. Batch Releases

Prior to the release of liquid from a waste tank, a sample is collected and analyzed by gamma spectroscopy for the principal gamma emitting radionuclides. To demonstrate compliance with the concentration requirements addressed in Section I.C.1 above, the measured radionuclide concentrations are compared with the allowable MPCs; dilution in the discharge conduit is considered, and an allowable release rate is verified.

The total activity released in each batch is determined by multiplying the volume released by the concentration of each radionuclide. The actual volume released is based on the difference in tank levels prior to and after the release. A proportional composite sample is also withdrawn from each release, and this is used to prepare monthly tritium and quarterly gross alpha, iron-55, nickel-63, strontium-89, and strontium-90 samples for analysis.

There were no major changes to the liquid radwaste system in calendar year 2006.

2. Continuous Releases

To account for activity from continuous releases, a sample is collected and analyzed by gamma spectroscopy for the principal gamma emitting radionuclides. The measured radionuclide concentrations are compared with the allowable MPC concentrations in the discharge conduit, and an allowable release rate is verified.

When steam generator blowdown is discharged to the circulating water conduits, it is sampled and gamma isotopic analysis is performed at a minimum of three times per week and these samples are used in turn to prepare a weekly blowdown composite sample based on each day's blowdown. These results are multiplied by the actual quantity of blowdown to determine the total activity released. The weekly composite is also used to prepare monthly composites for tritium analysis.

During periods of primary-to-secondary leakage, the secondary system becomes contaminated and subsequently contaminates the turbine building sumps. The low-level activity water (predominantly tritium) contained in the turbine building sumps is discharged to the circulating water conduits. This water is sampled weekly and composited. The composite sample is analyzed at least monthly for tritium and principal gamma emitting radionuclides. The results are multiplied by the actual quantity of liquid released to determine the total activity released.

D. Estimation of Total Error

Total error for all releases was estimated using, as a minimum, the random counting error associated with typical releases. In addition to this random error, the following systematic errors were also examined:

1. Liquid

   a. Error in volume of liquid released prior to dilution during batch releases.
   b. Error in volume of liquid released via steam generator blowdown.
   c. Error in amount of dilution water used during the reporting period.

2. Gases

   a. Error in main vent release flow.
   b. Error in sample flow rate.
   c. Error in containment purge release flow.
   d. Error in gas decay tank pressure.

Where errors could be estimated they are usually considered additive.

E. Reporting and Recordkeeping for Decommissioning

In accordance with 10 CFR 50.75.g, each licensee shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Commission considers important to decommissioning consists of records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when significant contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

To assist in the decommissioning, and to provide early and advance detection of any unmonitored releases of radioactive material from the site, groundwater is routinely sampled. These groundwater samples are analyzed for gamma and tritium activity. Sample size and/or count times are adjusted to achieve analytical sensitivities better than the environmental LLDs for gamma activity and approximately 350 pCi/l for tritium.

Groundwater samples were collected from five piezometer tubes in 2006. A piezometer tube is a shallow monitoring well which allows access to groundwater at a depth of approximately 40 feet beneath the site. Four of the five piezometer tubes sampled in 2006 showed no positive, plant-related activity. Three samples from piezometer tube #11, however, indicated tritium was present at concentrations that varied from 88 to 454 pCi/liter. The 2006 analyses results for piezometer tube #11 are reproduced below.

Groundwater Monitoring Sample Results – Piezometer Tube #11

Sample location	Date	Tritium Concentration	
		microcuries/milliliter	picocuries/liter
11 Piezometer Tube	19-Jan-06 09:52	Not Detected, <1.48E-6	Not Detected, <1,480
11 Piezometer Tube	26-Jan-06 12:55	Not Detected, <1.36E-6	Not Detected, <1,360
11 Piezometer Tube	2-Feb-06 15:30	Not Detected, <1.50E-6	Not Detected, <1,500
11 Piezometer Tube	14-Feb-06 13:30	Not Detected, <1.57E-6	Not Detected, <1,570
11 Piezometer Tube	16-Mar-06 12:45	Not Detected, < 1.54E-6	Not Detected, <1,540
11 Piezometer Tube	18-Apr-06 13:05	Not Detected, < 1.53E-6	Not Detected, <1,530
11 Piezometer Tube	16-May-06 13:06	Not Detected, < 1.60E-6	Not Detected, <1,600
11 Piezometer Tube	20-May-06	8.8E-8	88
11 Piezometer Tube	24-Jun-06 09:00	Not Detected, < 1.64E-6	Not Detected, <1,640
11 Piezometer Tube	30-Sep-06 09:30	Not Detected, < 1.49E-6	Not Detected, <1,490
11 Piezometer Tube	14-Dec-06 13:05	4.54E-7	454
11 Piezometer Tube	15-Dec-06 08:48	4.26E-7	426

One of the positive analysis results from 2006, 88 pCi/l in May, was analyzed by an independent laboratory at the University of Rochester using a significantly improved analytical sensitivity. No gamma activity was detected in any of these samples. An entry was made in the decommissioning file to document tritium found in 11 Piezometer Tube. Calvert Cliffs submitted an industry operating experience report (OE21958) in 2006, and additional information is contained in that report. Since this tritium originated from normal radwaste discharges, the tritium activity released to the groundwater was reported in previous Annual Radioactive Effluent Release Reports.

The tritium found in 2006 is a reappearance of the tritium plume first discovered 3-Dec-05. See the 2005 Annual Radioactive Effluent Release Report for a summary of the 2005 tritium analysis results. The tritium contamination is contained within the protected area, on site property. The shallow monitoring wells are not used for drinking water, and the shallow groundwater at this location does not impact any drinking water pathway. Hydrogeologic studies of the site were conducted in 2006 which indicate the tritium plume is traveling toward the Chesapeake Bay, and should reach the Bay sometime between 2010 and 2028. Since the tritium was originally permitted for discharge to the Chesapeake Bay, there will be no significant environmental impact. The total amount of tritium in the groundwater is estimated to be less than 0.0001 curies (or 0.1 millicuries). It is estimated that on the order of 60,000 liters of shallow groundwater may contain tritium. Based on the original geologic studies of the site contained in the Updated Final Safety Analysis Report, the plume is not able to penetrate into the deeper, drinking water aquifers due to confining geologic structures. A limited quantity of potable water is theoretically available from shallow wells up-gradient from the plant, but being up-gradient, those wells would not be affected by tritium in the current plume. As a result, there is no dose pathway to an actual individual. Nonetheless, dose calculations estimate the total dose to a hypothetical individual consuming groundwater from the plume (and only groundwater from the plume for an entire year) is less than 0.1 mR. Since the average US citizen receives on the order of 300 mR/year from natural sources of radiation (including medical treatments), a hypothetical increase of 0.1 mR/year would not pose a significant increase in safety risk. As a result, there is no adverse safety significance associated with this groundwater contamination event.

There was no activity found in any of the other piezometer tubes. The following table lists the results from all piezometer tubes except piezometer tube #11.

Groundwater Monitoring Sample Results – Excluding Piezometer Tube #11

Sample location	Date	Tritium Concentration	
		microcuries/milliliter	picocuries/liter
12 Piezometer Tube	24-Jun-06 09:15	Not Detected, < 1.64E-6	Not Detected, <1,640
13 Piezometer Tube	24-Jun-06 09:30	Not Detected, < 1.64E-6	Not Detected, <1,640
15 Piezometer Tube	24-Jun-06 09:30	Not Detected, < 1.64E-6	Not Detected, <1,640
18 Piezometer Tube	24-Jun-06 09:40	Not Detected, < 1.64E-6	Not Detected, <1,640
12 Piezometer Tube	30-Sep-06 09:40	Not Detected, < 1.49E-6	Not Detected, <1,490
13 Piezometer Tube	30-Sep-06 09:50	Not Detected, < 1.49E-6	Not Detected, <1,490
15 Piezometer Tube	30-Sep-06 10:00	Not Detected, < 1.49E-6	Not Detected, <1,490
18 Piezometer Tube	30-Sep-06 09:10	Not Detected, < 1.49E-6	Not Detected, <1,490
13 Piezometer Tube	14-Dec-06 13:30	Not Detected, < 3.24E-7	Not Detected, <324
15 Piezometer Tube	14-Dec-06 13:42	Not Detected, < 3.24E-7	Not Detected, <324
18 Piezometer Tube	14-Dec-06 12:49	Not Detected, < 3.24E-7	Not Detected, <324
12 Piezometer Tube	14-Dec-06 13:16	Not Detected, < 3.24E-7	Not Detected, <324
12 Piezometer Tube	15-Dec-06 09:12	Not Detected, < 3.24E-7	Not Detected, <324

VI. BATCH RELEASES

	2006 1ST QUARTER	2006 2ND QUARTER	2006 3RD QUARTER	2006 4TH QUARTER
A. Liquid				
1. Number of batch releases	1.20E+01	1.10E+01	9.00E+00	1.70E+01
2. Total time period for batch releases (min)	5.28E+03	1.33E+04	4.09E+03	2.27E+04
3. Maximum time period for a batch release (min)	5.80E+02	8.35E+03	6.56E+02	6.18E+03
4. Average time period for batch releases (min)	4.40E+02	1.21E+03	4.54E+02	1.34E+03
5. Minimum time period for a batch release (min)	2.42E+01	2.80E+01	3.00E+01	9.00E+00
6. Average stream flow during periods of effluent into a flowing stream (liters/min of dilution water)	4.35E+06	4.49E+06	4.53E+06	4.61E+06
B. Gaseous				
1. Number of batch releases	7.00E+00	9.00E+00	8.00E+00	4.00E+00
2. Total time period for batch releases (min)	2.43E+03	7.62E+03	2.23E+03	1.54E+03
3. Maximum time period for a batch release (min)	6.28E+02	3.98E+03	7.34E+02	5.67E+02
4. Average time period for batch release (min)	3.47E+02	8.46E+02	2.79E+02	3.85E+02
5. Minimum time period for a batch release (min)	9.00E+01	1.25E+02	3.90E+01	2.14E+02

VII. ABNORMAL RELEASES

	2006 1ST QUARTER	2006 2ND QUARTER	2006 3RD QUARTER	2006 4TH QUARTER
A. Liquid				
1. Number of releases	- 0 -	- 0 -	- 0 -	- 0 -
2. Total activity released (Curies)	- 0 -	- 0 -	- 0 -	- 0 -
B. Gaseous				
1. Number of releases	- 0 -	- 0 -	- 0 -	- 0 -
2. Total activity releases (Curies)	- 0 -	- 0 -	- 0 -	- 0 -

TABLE 1A - REG GUIDE 1.21
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

		UNITS	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	EST. TOTAL ERROR, %
A.	**FISSION AND ACTIVATION GASES**						
1.	Total Release	Ci	5.37E+02	8.13E+01	7.92E+01	1.78E+02	±1.20E+01
2.	Average release rate for period	μCi/sec	6.90E+01	1.03E+01	9.97E+00	2.24E+01	
3.	Percent of Tech. Spec. limit (1)	%	8.43E-03	7.40E-04	1.14E-03	3.32E-03	
4.	Percent of Tech. Spec. limit (2)	%	4.41E-03	8.97E-04	7.90E-04	1.89E-03	
5.	Percent of Tech. Spec. limit (3)	%	1.23E-01	1.07E-02	1.67E-02	4.84E-02	
6.	Percent of Tech. Spec. limit (4)	%	6.15E-02	5.33E-03	8.37E-03	2.42E-02	
7.	Percent of Tech. Spec. limit (5)	%	2.29E-01	4.63E-02	3.95E-02	9.37E-02	
8.	Percent of Tech. Spec. limit (6)	%	1.15E-01	2.31E-02	1.98E-02	4.69E-02	
B.	**IODINES**						
1.	Total Iodine - 131	Ci	2.89E-02	2.80E-04	8.91E-05	3.50E-03	±6.50E+00
2.	Average release rate for period	μCi/sec	3.72E-03	3.56E-05	1.12E-05	4.40E-04	
3.	Percent of Tech. Spec. limit (7)	%	8.85E-03	8.47E-05	2.66E-05	1.05E-03	
4.	Percent of Tech. Spec. limit (8)	%	2.18E-01	2.11E-03	6.71E-04	2.63E-02	
5.	Percent of Tech. Spec. limit (9)	%	1.09E-01	1.06E-03	3.36E-04	1.32E-02	
C.	**PARTICULATES**						
1.	Particulates with half lives greater than 8 days	Ci	9.08E-09	1.62E-05	(10)	(10)	±1.20E+01
2.	Average release rate for period	μCi/sec	1.17E-09	2.06E-06	(10)	(10)	
3.	Percent of Tech. Spec. limit (7)	%	4.05E-10	1.12E-06	(10)	(10)	
4.	Percent of Tech. Spec. limit (8)	%	1.02E-08	3.48E-05	(10)	(10)	
5.	Percent of Tech. Spec. limit (9)	%	5.11E-09	1.74E-05	(10)	(10)	
6.	Gross alpha radioactivity	Ci	(10)	(10)	(10)	(10)	N/A
D.	**TRITIUM**						
1.	Total Release	Ci	9.25E-01	1.34E+00	1.79E+00	7.34E-01	±1.32E+01
2.	Average release rate for period	μCi/sec	1.19E-01	1.71E-01	2.25E-01	9.23E-02	

TABLE 1A - REG GUIDE 1.21
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

NOTES TO TABLE 1A

(1) Percent of I.A.1 whole body dose rate limit (500 mRem/year)

(2) Percent of I.A.1 skin dose rate limit (3000 mRem/year)

(3) Percent of I.A.3 quarterly gamma-air dose limit (10 mRad)

(4) Percent of I.A.3 yearly gamma-air dose limit (20 mRad)

(5) Percent of I.A.3 quarterly beta-air dose limit (20 mRad)

(6) Percent of I.A.3 yearly beta-air dose limit (40 mRad)

(7) Percent of I.B.1 organ dose rate limit (1500 mRem/year)

(8) Percent of I.B.3 quarterly organ dose limit (15 mRem)

(9) Percent of I.B.3 yearly organ dose limit (30 mRem)

(10) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of ODCM Surveillance Requirement 4.11.2.1.2.

TABLE 1C - REG GUIDE 1.21
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

			CONTINUOUS MODE				BATCH MODE			
		UNITS	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
1. FISSION AND ACTIVATION GASES										
Argon	-41	Ci	(2)	(2)	(2)	(2)	6.90E-04	1.71E-03	(2)	3.19E-04
Krypton	-85	Ci	7.45E+01	(2)	(2)	6.59E-01	9.57E+00	4.92E+01	2.69E+01	2.68E+01
Krypton	-85m	Ci	7.79E-02	(2)	(2)	4.31E-03	3.20E-03	(2)	(2)	5.71E-04
Krypton	-87	Ci	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Krypton	-88	Ci	2.05E-02	(2)	(2)	(2)	2.38E-03	(2)	(2)	3.82E-04
Xenon	-131m	Ci	7.67E+00	1.10E+00	5.70E+00	1.19E-01	2.68E-02	3.50E-01	2.03E-02	1.58E-01
Xenon	-133	Ci	4.23E+02	2.75E+01	4.14E+01	1.38E+02	4.46E+00	1.05E+00	1.21E+00	1.67E+00
Xenon	-133m	Ci	6.41E+00	(2)	(2)	2.51E-02	4.58E-02	7.77E-04	8.22E-03	3.88E-03
Xenon	-135	Ci	1.05E+01	2.15E+00	3.97E+00	9.99E+00	4.59E-02	6.97E-04	(2)	9.58E-03
Xenon	-135m	Ci	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Xenon	-138	Ci	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Total for Period		Ci	5.22E+02	3.08E+01	5.10E+01	1.49E+02	1.42E+01	5.06E+01	2.82E+01	2.87E+01
2. HALOGENS										
Iodine	-131	Ci	2.89E-02	2.80E-04	8.91E-05	3.50E-03	(1)	(1)	(1)	1.54E-06
Iodine	-132	Ci	4.28E-03	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Iodine	-133	Ci	2.17E-02	4.38E-04	3.35E-05	9.92E-04	(1)	(1)	(1)	3.54E-07
Iodine	-135	Ci	3.87E-03	(2)	(2)	(2)	(1)	(1)	(1)	(2)
Total for Period		Ci	5.88E-02	7.18E-04	1.23E-04	4.49E-03	(1)	(1)	(1)	1.89E-06
3. PARTICULATES (half life > 8 days)										
Manganese	-54	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Iron	-55	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Iron	-59	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Cobalt	-58	Ci	(2)	(2)	(2)	(2)	(1)	8.99E-06	(1)	(1)
Cobalt	-60	Ci	(2)	(2)	(2)	(2)	(1)	7.19E-06	(1)	(1)
Zinc	-65	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Strontium	-89	Ci	9.08E-09	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Strontium	-90	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Molybdenum	-99	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Cesium	-134	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Cesium	-137	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Cerium	-141	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)

TABLE 1C - REG GUIDE 1.21
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

		CONTINUOUS MODE				BATCH MODE			
	UNITS	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Cerium -144	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Gross Alpha Radioactivity	Ci	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(1)
Total For Period	Ci	9.08E-09	(2)	(2)	(2)	(1)	1.62E-05	(1)	(1)

NOTES TO TABLE 1C

(1) Iodines and particulates in batch releases are accounted for with the main vent continuous samplers when the release is made through the plant main vent.

(2) Less than minimum detectable activity which meets the LLD requirements of ODCM Surveillance Requirement 4.11.2.1.2.

TABLE 2A - REG GUIDE 1.21
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	EST. TOTAL ERROR, %
A. FISSION AND ACTIVATION PRODUCTS						
1. Total Release (not including tritium, gases, alpha)	Ci	3.23E-02	3.65E-03	1.03E-02	2.46E-03	±1.03E+01
2. Average diluted concentration during period	µCi/ml	2.28E+10	2.20E+10	1.85E+10	2.12E+10	
3. Percent of Tech. Spec. limit (1)	%	2.92E-02	1.69E-02	1.69E-02	1.29E-02	
4. Percent of Tech. Spec. limit (2)	%	1.46E-02	8.45E-03	8.45E-03	6.45E-03	
5. Percent of Tech. Spec. limit (3)	%	2.85E-02	8.00E-03	1.92E-02	2.56E-02	
6. Percent of Tech. Spec. limit (4)	%	1.42E-02	4.00E-03	9.60E-03	1.28E-02	
B. TRITIUM						
1. Total Release	Ci	3.41E+02	2.05E+02	2.84E+02	7.25E+02	±1.03E+01
2. Average diluted concentration during period	µCi/ml	5.54E-07	2.37E-07	3.04E-07	7.87E-07	
3. Percent of applicable limit (5)	%	1.85E-02	7.90E-03	1.01E-02	2.62E-02	
C. DISSOLVED AND ENTRAINED GASES						
1. Total Release	Ci	8.94E-01	3.06E-02	7.85E-03	7.74E-01	±1.03E+01
2. Average diluted concentration during period	µCi/ml	3.93E-08	1.39E-09	4.25E-10	2.64E-08	
D. GROSS ALPHA RADIOACTIVITY						
1. Total Release	Ci	(6)	(6)	(6)	(6)	N/A
E. VOLUME OF WASTE RELEASED (prior to dilution)						
1. Volume processed through radwaste system	liters	2.27E+06	2.97E+06	1.64E+06	4.62E+06	±1.30E+00
2. Volume low activity from secondary system	liters	3.97E+07	4.31E+07	4.82E+07	4.49E+07	±1.30E+00
F. VOLUME OF DILUTION WATER USED DURING PERIOD (7)	liters	9.11E+11	1.16E+12	1.20E+12	1.20E+12	±1.64E+01

NOTES TO TABLE 2A

(1) Percent of I.C.3 Quarterly Organ Dose Limit (10 mRem) to maximum exposed organ
(2) Percent of I.C.3 Yearly Organ Dose Limit (20 mRem) to maximum exposed organ
(3) Percent of I.C.3 Quarterly Whole Body Dose Limit (3 mRem)
(4) Percent of I.C.3 Yearly Whole Body Dose Limit (6 mRem)
(5) Limit used is 3×10^{-3} µCi/ml
(6) Less than minimum detectable activity which meets the LLD requirements of ODCM Surveillance Requirement 4.11.1.1.1.
(7) Includes dilution water used during continuous discharges.

TABLE 2B - REG GUIDE 1.21
LIQUID EFFLUENTS

		CONTINUOUS MODE				BATCH MODE			
NUCLIDES RELEASED	Units	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Beryllium – 7	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Sodium – 24	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Chromium - 51	Ci	(1)	(1)	(1)	(1)	(1)	5.01E-04	(1)	(1)
Manganese - 54	Ci	(1)	(1)	(1)	(1)	1.89E-06	8.44E-05	1.07E-04	2.79E-05
Iron – 55	Ci	(2)	(2)	(2)	(2)	1.43E-02	(1)	8.38E-03	(1)
Cobalt – 57	Ci	(1)	(1)	(1)	(1)	4.40E-06	5.18E-06	2.41E-06	5.95E-06
Cobalt – 58	Ci	(1)	(1)	(1)	(1)	6.16E-04	1.75E-03	6.51E-04	2.11E-04
Iron – 59	Ci	(1)	(1)	(1)	(1)	(1)	4.21E-05	7.34E-06	2.04E-06
Cobalt – 60	Ci	(1)	(1)	(1)	(1)	1.26E-04	6.54E-04	5.15E-04	1.39E-04
Nickel-63	Ci	(1)	(1)	(1)	(1)	2.33E-04	(1)	5.14E-04	(1)
Zinc – 65	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Strontium - 89	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Strontium - 90	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Strontium - 92	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Niobium - 95	Ci	(1)	(1)	(1)	(1)	2.77E-06	2.23E-04	4.78E-05	1.55E-05
Zirconium - 95	Ci	(1)	(1)	(1)	(1)	1.63E-06	1.47E-04	6.70E-06	2.39E-06
Niobium - 97	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Zirconium - 97	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Molybdenum - 99	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Technetium - 99m	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Ruthenium - 103	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Rhodium - 105	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Ruthenium - 105	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Silver - 110m	Ci	(1)	(1)	(1)	(1)	1.77E-04	(1)	(1)	(1)
Tin – 113	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tin – 117m	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Antimony - 122	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Antimony - 124	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Antimony - 125	Ci	(1)	(1)	(1)	(1)	1.52E-05	4.92E-05	(1)	3.90E-06
Tellurium – 125m	Ci	(1)	(1)	(1)	(1)	1.38E-02	(1)	(1)	(1)
Tellurium - 132	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Iodine - 131	Ci	(1)	(1)	(1)	(1)	2.58E-03	4.50E-05	(1)	1.47E-03

TABLE 2B - REG GUIDE 1.21
LIQUID EFFLUENTS

		CONTINUOUS MODE				BATCH MODE			
NUCLIDES RELEASED	Units	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Iodine - 132	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Iodine – 133	Ci	(1)	(1)	(1)	(1)	5.87E-05	(1)	(1)	3.04E-05
Iodine – 135	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cesium – 134	Ci	(1)	(1)	(1)	(1)	6.50E-05	6.68E-05	4.03E-05	2.76E-04
Cesium – 136	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	1.09E-05
Cesium – 137	Ci	(1)	(1)	(1)	(1)	1.59E-04	8.26E-05	5.24E-05	2.66E-04
Barium – 140	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Lanthanum - 140	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Cerium – 144	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Europium – 154	Ci	(1)	(1)	(1)	(1)	1.35E-04	(1)	(1)	(1)
Europium – 155	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tungsten – 187	Ci	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Total For Period	Ci	(1)	(1)	(1)	(1)	3.23E-02	3.65E-03	1.03E-02	2.46E-03
Krypton – 85	Ci	(1)	(1)	(1)	(1)	9.62E-02	2.76E-02	(1)	5.67E-02
Xenon - 131m	Ci	(1)	(1)	(1)	(1)	2.16E-02	(1)	(1)	1.50E-02
Xenon – 133	Ci	(1)	(1)	(1)	(1)	7.71E-01	2.89E-03	7.85E-03	6.98E-01
Xenon – 133m	Ci	(1)	(1)	(1)	(1)	4.79E-03	6.84E-05	(1)	4.16E-03
Xenon – 135	Ci	(1)	(1)	(1)	(1)	8.89E-05	(1)	6.36E-06	1.29E-04
Total For Period	Ci	(1)	(1)	(1)	(1)	8.94E-01	3.06E-02	7.85E-03	7.74E-01

NOTES TO TABLE 2B

(1) Less than minimum detectable activity which meets the LLD requirements of ODCM Surveillance Requirement 4.11.1.1.1.

(2) Continuous mode effluents are not analyzed for Fe-55.

TABLE 3A
CALVERT CLIFFS NUCLEAR POWER PLANT
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
2006
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

1. Type of Waste	Units	12-Month Period	Est. Total Error %
a) Spent resins, Filters	M^3 Ci	1.36E+01 1.33E+01	25%
b) Dry compressible waste, contaminated equipment, etc.	m^3 Ci	1.07E+03 1.54E+00	25%
c) Irradiated components, control rods, etc.	m^3 Ci	0.00E+00 0.00E+00	25%
d) Other (cartridge filters, misc. dry compressible, Oil)	m^3 Ci	1.33E+01 1.77E-02	25%

Volume shipped represents waste generated prior to offsite volume reduction.

2. **Estimate of Major Nuclides** (By Type of Waste - Only nuclides >1 % are reported)

a)	H-3	6.73E+00%
	C-14	1.23E+00%
	Mn-54	2.39E+00%
	Fe-55	1.82E+01%
	Co-58	6.51E+00%
	Co-60	5.04E+00%
	Ni-63	3.14E+01%
	Sb-125	1.23E+00%
	Cs-134	1.03E+01%
	Cs-137	1.55E+01%
b)	H-3	3.53E+00%
	Cr-51	2.49E+00%
	Mn-54	1.87E+00%
	Fe-55	2.88E+01%
	Co-58	1.22E+01%
	Co-60	6.60E+00%
	Ni-63	2.34E+01%
	Zr-95	1.50E+00%
	Nb-95	2.73E+00%
	I-131	1.50E+00%
	Cs-134	3.81E+00%
	Cs-137	8.20E+00%
c)	N/A	N/A

d)

H-3	2.04E+00%
Cr-51	9.94E+00%
Mn-54	1.52E+00%
Fe-55	1.79E+01%
Co-58	2.55E+01%
Co-60	3.75E+00%
Ni-63	1.32E+01%
Zr-95	3.43E+00%
Nb-95	5.71E+00%
I-131	8.84E+00%
Cs-134	2.50E+00%
Cs-137	2.97E+00%

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
4	Motor Surface Transit	Duratek Oak Ridge, TN
4	Motor Surface Transit	Studsvik, Inc
18	Motor Surface Transit	Studsvik/ RACE, Inc

B. <u>IRRADIATED FUEL SHIPMENTS (DISPOSITION)</u> N/A