

SEMI-ANNUAL EFFLUENT RELEASE REPORT

NORTH ANNA POWER STATION

JANUARY 01, 1985, TO JUNE 30, 1985

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FORWARD

This report is submitted as required by Appendix A to Operating License Nos. NPF-4 and NPF-7, Technical Specifications for North Anna Power Station, Units, 1 and 2, Virginia Electric and Power Company, Docket Nos. 50-338, 50-339, Section 6.9.1.12.

RADIOACTIVE EFFLUENT RELEASE REPORT
FOR THE
NORTH ANNA POWER STATION
JANUARY 01, 1985, TO JUNE 30, 1985

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1.0 PURPOSE AND SCOPE

The Radioactive Effluent Release Report includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents of Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a quarterly basis following the format of Appendix B thereof. The report also includes a list of unplanned releases during the reporting period.

As required by Technical Specification 6.15, changes to the ODCM for the time period covered by this report are included. Information is provided to support the changes along with a package of those pages of the ODCM changed.

This report includes changes to the PCP with information and documentation necessary to support the rationale for the changes as required by Technical Specification 6.14.

Major changes to radioactive solid waste treatment systems are reported as required by Technical Specification 6.16. Information to support the reason for the change and a summary of the 10 CFR Part 50.59 evaluation are included. In lieu of reporting major changes in this report, major changes to the radioactive solid waste treatment systems may be submitted as part of the annual FSAR update.

As required by Technical Specification 3.3.3.10.b and 3.3.3.11.b a list and explanation for the inoperability of radioactive liquid and/or gaseous effluent monitors is provided in this report.

2.0 DISCUSSION

The basis for the calculation of the percent of technical specification for the critical organ in Table 1A is Technical Specification 3.11.2.1.b.

Technical Specification 3.11.2.1.b requires that the dose rate for iodine-131, for tritium, and for all radionuclides in particulate form with half lives greater than 8 days shall be less than or equal to 1500 mrem/yr to the critical organ at and beyond the site boundary. The critical organ is the child's thyroid, inhalation pathway.

The basis for the calculation of percent of technical specification for the total body and skin in Table 1A is Technical Specification 3.11.2.1.a. Technical Specification 3.11.2.1.a requires that the dose rate for noble gases to areas at or beyond site boundary shall be less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

The basis for the calculation of the percent of technical specification in Table 2A is Technical Specification 3.11.1.1. Technical Specification 3.11.1.1 states that the concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} microcuries/ml.

Percent of technical specification calculations are based on the total gaseous or liquid effluents released for that respective quarter.

Unplanned releases presented in Attachment 6 are defined according to the criteria presented in 10 CFR Part 50.73. Gaseous unplanned releases are those radioactive releases that exceed 2 times the applicable concentrations of the limits specified in Appendix B, Table II of 10 CFR Part 20 in unrestricted areas, when averaged over a time period of one hour. Liquid unplanned releases are those effluent releases that exceed 2 times the

limiting combined Maximum Permissible Concentration (MPC) specified in Appendix B, Table II of 10 CFR Part 20 in unrestricted areas for all radionuclides except tritium and dissolved noble gases, when averaged over a time period of one hour.

3.0 SUPPLEMENTAL INFORMATION

There are no inclusions for the time period covered by this report.

ATTACHMENT 1
EFFLUENT RELEASE DATA
1/85-6/85

This attachment includes a summary of the quantities of radioactive liquid and gaseous effluents and solid waste, as outlined in Regulatory Guide 1.21.

TABLE 1A
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES
NORTH ANNA POWER STATION

	UNITS	1st QUARTER	2nd QUARTER	EST. TOTAL % ERROR
A. <u>Fission and Activation Gases:</u>				
1. Total Release	Ci	7.28E+1	2.40E+2	1.50E+1
2. Average Release Rate for Period	μCi/sec	9.36E+0	3.05E+1	
B. <u>Iodines:</u>				
1. Total Iodine-131 Release	Ci	9.36E-3	3.38E-2	1.50E+1
2. Average Release Rate for Period:	μCi/sec	1.20E-3	4.30E-3	
C. <u>PARTICULATES (T_{1/2} > 8 days)</u>				
1. Total Particulate (T _{1/2} > 8 days) Release	Ci	2.83E-5	1.94E-3	1.50E+1
2. Average Release Rate for Period	μCi/sec	3.64E-6	2.47E-4	
3. Gross Alpha Radioactivity Release	Ci	1.71E-5	6.64E-5	
D. <u>Tritium:</u>				
1. Total Release	Ci	5.43E+0	2.25E+0	1.50E+1
2. Average Release Rate for Period	μCi/sec	6.98E-1	2.86E-1	
E. <u>Percentage of Technical Specification Limits:</u>				
1. Total Body Dose Rate	%	3.24E-2	1.34E-1	
2. Skin Dose Rate	%	9.24E-3	3.82E-2	
3. Critical Organ Dose Rate	%	1.35E-3	3.01E-3	

TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
GASEOUS EFFLUENTS MIXED MODE RELEASES
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
Fission and Activation Gases:					
Krypton - 85	Ci	*	*	*	*
Krypton - 85m	Ci	*	*	*	1.13E-1
Krypton - 87	Ci	*	*	*	1.64E-2
Krypton - 88	Ci	*	*	*	1.14E-1
Xenon - 131m	Ci	*	*	9.71E-2	*
Xenon - 133	Ci	2.49E+1	3.16E+1	8.46E+0	3.38E+1
Xenon - 133m	Ci	*	*	6.04E-2	6.59E-1
Xenon - 135	Ci	3.02E+0	7.61E+0	*	4.03E+0
Xenon - 135m	Ci	*	*	*	*
Xenon - 138	Ci	*	*	*	*
Other (Specify)	Ci				
Argon - 41	Ci	*	*	*	6.86E-2
	Ci				
	Ci				
Total for Period	Ci	2.79E+1	3.92E+1	8.62E+0	3.88E+1
	Ci				
Iodines:	Ci				
Iodine - 131	Ci	1.63E-5	4.15E-5	4.23E-6	4.21E-6
Iodine - 132	Ci	*	*	*	2.48E-7
Iodine - 133	Ci	6.18E-5	1.37E-4	3.57E-7	6.82E-6
Iodine - 134	Ci	*	*	*	*
Iodine - 135	Ci	*	*	*	2.42E-6
	Ci				
Total for Period	Ci	7.81E-5	1.79E-4	4.59E-6	1.37E-5
	Ci				
Particulates:	Ci				
Strontium - 89	Ci	*	5.04E-9		
Strontium - 90	Ci	*	*		
Cesium - 134	Ci	*	1.33E-8	*	*
Cesium - 137	Ci	*	3.03E-8	*	*
Barium - 140	Ci	*	*	*	*
Lanthanum - 140	Ci	*	*	*	*
Other (Specify)	Ci				
Manganese - 54	Ci	*	1.09E-8	*	4.64E-9
Iron - 55	Ci	*	5.97E-8		
Cobalt - 60	Ci	5.22E-8	*	*	*

* Less than lower limits of detection

TABLE 1C
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
GASEOUS EFFLUENTS-GROUND-LEVEL RELEASES
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
Fission and Activation Gases:					
Krypton - 85	C1	*	*	*	*
Krypton - 85m	C1	3.76E-1	1.64E+0	*	*
Krypton - 87	C1	8.65E-1	3.86E+0	*	*
Krypton - 88	C1	9.30E-1	4.11E+0	*	*
Xenon - 131m	C1	*	*	*	*
Xenon - 133	C1	1.86E+0	2.66E+1	1.64E-5	1.91E-4
Xenon - 133m	C1	*	*	*	*
Xenon - 135	C1	1.67E+1	6.06E+1	6.34E-2	1.23E-1
Xenon - 153m	C1	9.42E+0	3.80E+1	2.32E-2	6.24E-2
Xenon - 138	C1	4.34E+0	2.11E+1	*	*
Other (Specify)	C1				
Argon - 41	C1	1.75E+0	6.38E+0	5.26E-6	2.12E-5
	C1				
	C1				
Total for Period	C1	3.62E+1	1.62E+2	8.65E-2	1.86E-1
	C1				
Iodines:	C1				
Iodine - 131	C1	6.62E-4	2.18E-3	2.61E-6	1.37E-5
Iodine - 132	C1	*	3.43E-5	1.04E-5	9.23E-5
Iodine - 133	C1	8.56E-3	3.09E-2	1.87E-5	1.07E-4
Iodine - 134	C1	*	*	9.70E-6	1.55E-4
Iodine - 135	C1	*	2.96E-5	2.06E-5	1.39E-4
	C1				
Total for Period	C1	9.22E-3	3.31E-2	6.20E-5	5.07E-4
	C1				
Particulates:	C1				
Strontium - 89	C1	*	2.98E-6		
Strontium - 90	C1	*	*		
Cesium - 134	C1	*	1.66E-5	8.18E-7	3.09E-6
Cesium - 137	C1	1.74E-5	6.56E-5	1.40E-6	5.79E-6
Barium - 140	C1	*	*	*	*
Other (Specify)	C1				
Lanthanum - 140	C1	*	*	*	*
Niobium - 95	C1	*	*	1.12E-7	9.31E-7
Iron - 55	C1	3.69E-10	4.27E-5		
Cobalt - 58	C1	3.20E-6	2.25E-6	5.50E-7	3.92E-6
Cobalt - 60	C1	4.81E-6	1.12E-5	*	3.16E-8

* Less than lower limits of detection

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* Less than lower limits of detection

TABLE 2A
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES
NORTH ANNA POWER STATION

	UNIT	1st QUARTER	2nd QUARTER	EST. TOTAL ERROR %
<u>A. Fission & Activation Products</u>				
1. Total release (not including tritium, gases, alpha)	Ci	1.34E-1	2.40E-1	1.50E+1
2. Average diluted concentration during period	µCi/ml	1.90E-10	3.38E-10	
3. Percent of applicable limit (T.S.)	%	4.55E-3	5.92E-3	
<u>B. Tritium</u>				
1. Total release activity.	Ci	4.37E+2	4.01E+2	1.50E+1
2. Average diluted concentration during period.	µCi/ml	6.21E-7	5.64E-7	
3. Percent of applicable limit (T.S.)	%	2.07E-2	1.88E-2	
<u>C. Dissolved and entrained gases</u>				
1. Total release activity.	Ci	6.05E-1	2.27E-1	1.50E+1
2. Average diluted concentration during period.	µCi/ml	8.59E-10	3.20E-10	
3. Percent of applicable limit (T.S.)	%	4.30E-4	1.60E-4	
<u>D. Gross Alpha Radioactivity</u>				
1. Total release activity.	Ci	<MDA	<MDA	1.50E+1
<u>E. Volume of waste released (prior to dilution)</u>				
	Liters	8.61E+7	7.69E+7	
<u>F. Volume of dilution water used during period</u>				
	Liters	7.04E+11	7.11E+11	

TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
LIQUID EFFLUENTS
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER	QUARTER	QUARTER	QUARTER
Fission and Activation Products					
Strontium - 89	C1	*	*		
Strontium - 90	C1	*	*		
Cesium - 134	C1	3.05E-2	5.50E-2	1.09E-5	*
Cesium - 137	C1	6.14E-2	1.16E-1	2.40E-5	5.69E-6
Iodine - 131	C1	6.32E-3	3.32E-3	3.36E-5	*
Cobalt - 58	C1	1.59E-2	3.66E-3	1.28E-5	2.81E-4
Cobalt - 60	C1	1.08E-2	2.32E-2	1.33E-6	1.49E-3
Iron - 59	C1	*	*	*	*
Zinc - 65	C1	*	*	*	*
Chromium - 51	C1	*	*	*	*
Manganese - 54	C1	*	5.67E-4	2.88E-8	8.79E-5
Niobium - 95	C1	*	1.12E-3	1.71E-8	1.77E-5
Zirconium - 95	C1	*	*	*	*
Molybdenum - 99	C1	*	*	*	*
Technetium - 99	C1	*	*	6.36E-6	*
Barium - 140	C1	*	*	*	*
Lanthanum - 140	C1	*	*	*	*
Cerium - 141	C1	*	*	*	*
Other (Specify)	C1				
Sodium - 24	C1	2.12E-3	1.40E-2	8.08E-6	*
Cobalt - 57	C1	*	*	1.26E-8	7.87E-6
Silver - 110m	C1	2.15E-4	5.46E-3	7.15E-8	5.26E-5
Antimony - 122	C1	1.93E-3	6.28E-3	2.94E-8	*
Iodine - 132	C1	*	*	1.19E-4	*
Iodine - 133	C1	3.33E-3	6.88E-3	2.16E-4	*
Iodine - 134	C1	*	*	1.20E-4	*
Iodine - 135	C1	*	1.72E-3	2.71E-4	*
Tellurium - 131m	C1	*	*	3.87E-6	*
Cesium - 138	C1	*	*	7.40E-5	*
Iron - 55	C1	*	*		
	C1				
	C1				
	C1				
	C1				
	C1				
	C1				
Total for Period	C1	1.33E-1	2.38E-1	9.01E-4	1.94E-3

* less than lower limits of detection

TABLE 3 (1/85 - 6/85)
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

1. Type of Waste	UNIT	6-MONTH PERIOD	EST. TOTAL ERROR, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	1.24E+2 1.00E+2	1.0 E+1 1.0 E+1
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	1.40E+2 1.28E+1	1.0 E+1 1.0 E+1
c. Irradiated components, control rods, etc.	m ³ Ci	0. E 0. E	. E . E
d. Other (describe)	m ³ Ci	0. E 0. E	. E . E

2. Estimate of major nuclide composition (by type of waste)

a. H 3	%	38.6	1.0 E+1
Ni 63	%	22.4	1.0 E+1
Fe 55	%	12.95	1.0 E+1
Co 60	%	6.8	1.0 E+1
Cs 137	%	5.94	1.0 E+1
C 14	%	2.76	1.0 E+1
Cs 134	%	2.75	1.0 E+1
Cm 242	%	2.11	1.0 E+1
Co 58	%	1.72	1.0 E+1
Cm 244	%	1.02	1.0 E+1
Pu 241	%	1.01	1.0 E+1
I 131	%	.8	1.0 E+1
Mn 54	%	.71	1.0 E+1
Sb 122	%	.13	1.0 E+1
Pu 239	%	.08	1.0 E+1
Ce 144	%	.04	1.0 E+1
La 140	%	.03	1.0 E+1
Ba 140	%	.03	1.0 E+1
Sr 90	%	.01	1.0 E+1
Xe 133	%	.01	1.0 E+1
Nb 95	%	.007	1.0 E+1
Zr 95	%	.003	1.0 E+1
Pu 238	%	.002	1.0 E+1
Tc 99	%	.001	1.0 E+1
I 129	%	.0006	1.0 E+1
b.	%		. E
Fe 55	%	51.05	1.0 E+1
H 3	%	15.1	1.0 E+1
Co 60	%	10.4	1.0 E+1

ATTACHMENT 2

(01/85-06/85)

REVISIONS TO OFFSITE CALCULATION

MANUAL (ODCM)

No changes were made to the Offsite Dose Calculation
Manual (ODCM) for the time period covered by this report.

ATTACHMENT 3

(01/85-06/85)

REVISIONS TO PROCESS CONTROL PROGRAM (PCP)

No changes were made to the Process Control Program
(PCP) for the time period covered by this report.

ATTACHMENT 4

(01/85-06/85)

MAJOR CHANGES TO RADIOACTIVE SOLID

WASTE TREATMENT SYSTEMS

No major changes to the radioactive solid waste treatment systems were made for the time period covered by this report.

ATTACHMENT 5

(01/85-06/85)

RADIOACTIVE LIQUID AND GASEOUS

EFFLUENT MONITORING INSTRUMENTATION INOPERABLE

None of the radioactive effluent monitors met the requirements of Technical Specification 3.3.3.10.b and 3.3.3.11.b, for providing an account due to inoperability.

ATTACHMENT 6

(01/85-06/85)

UNPLANNED RELEASES

No unplanned releases, as defined according to the criteria presented in 10 CFR Part 50.73, occurred during the time period covered by this report.

SEMI-ANNUAL EFFLUENT RELEASE REPORT

NORTH ANNA POWER STATION

JANUARY 01, 1985, TO JUNE 30, 1985

PREPARED BY:

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Station Manager

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The basis for the calculation of the percent of technical specification for the critical organ in Table 1A is Technical Specification 3.11.2.1.b.

Technical Specification 3.11.2.1.b requires that the dose rate for iodine-131, for tritium, and for all radionuclides in particulate form with half lives greater than 8 days shall be less than or equal to 1500 mrem/yr to the critical organ at and beyond the site boundary. The critical organ is the child's thyroid, inhalation pathway.

The basis for the calculation of percent of technical specification for the total body and skin in Table 1A is Technical Specification 3.11.2.1.a. Technical Specification 3.11.2.1.a requires that the dose rate for noble gases to areas at or beyond site boundary shall be less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin.

The basis for the calculation of the percent of technical specification in Table 2A is Technical Specification 3.11.1.1. Technical Specification 3.11.1.1 states that the concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} microcuries/ml.

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B. <u>Iodines:</u>				
1. Total Iodine-131 Release	Ci	9.36E-3	3.38E-2	1.50E+1
2. Average Release Rate for Period:	μCi/sec	1.20E-3	4.30E-3	
C. <u>PARTICULATES ($T_{1/2} > 8$ days)</u>				
1. Total Particulate ($T_{1/2} > 8$ days) Release	Ci	2.83E-5	1.94E-3	1.50E+1
2. Average Release Rate for Period	μCi/sec	3.64E-6	2.47E-4	
3. Gross Alpha Radioactivity Release	Ci	1.71E-5	6.64E-5	
D. <u>Tritium:</u>				
1. Total Release	Ci	5.43E+0	2.25E+0	1.50E+1
2. Average Release Rate for Period	μCi/sec	6.98E-1	2.86E-1	
E. <u>Percentage of Technical Specification Limits:</u>				
1. Total Body Dose Rate	%	3.24E-2	1.34E-1	
2. Skin Dose Rate	%	9.24E-3	3.82E-2	
3. Critical Organ Dose Rate	%	1.35E-3	3.01E-3	

TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
GASEOUS EFFLUENTS MIXED MODE RELEASES
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
Fission and Activation Gases:					
Krypton - 85	C1	*	*	*	*
Krypton - 85m	C1	*	*	*	1.13E-1
Krypton - 87	C1	*	*	*	1.64E-2
Krypton - 88	C1	*	*	*	1.14E-1
Xenon - 131m	C1	*	*	9.71E-2	*
Xenon - 133	C1	2.49E+1	3.16E+1	8.46E+0	3.38E+1
Xenon - 133m	C1	*	*	6.04E-2	6.59E-1
Xenon - 135	C1	3.02E+0	7.61E+0	*	4.03E+0
Xenon - 133m	C1	*	*	*	*
Xenon - 138	C1	*	*	*	*
Other (Specify)	C1				
Argon - 41	C1	*	*	*	6.86E-2
	C1				
	C1				
Total for Period	C1	2.79E+1	3.92E+1	8.62E+0	3.88E+1
	C1				
Iodines:	C1				
Iodine - 131	C1	1.63E-5	4.15E-5	4.23E-6	4.21E-6
Iodine - 132	C1	*	*	*	2.48E-7
Iodine - 133	C1	6.18E-5	1.37E-4	3.57E-7	6.82E-6
Iodine - 134	C1	*	*	*	*
Iodine - 135	C1	*	*	*	2.42E-6
	C1				
Total for Period	C1	7.81E-5	1.79E-4	4.59E-6	1.37E-5
	C1				
Particulates:	C1				
Strontium - 89	C1	*	5.04E-9		
Strontium - 90	C1	*	*		
Cesium - 134	C1	*	1.33E-8	*	*
Cesium - 137	C1	*	3.03E-8	*	*
Barium - 140	C1	*	*	*	*
Lanthanum - 140	C1	*	*	*	*
Other (Specify)	C1				
Manganese - 54	C1	*	1.09E-8	*	4.64E-9
Iron - 55	C1	*	5.97E-8		
Cobalt - 60	C1	5.22E-8	*	*	*

* Less than lower limits of detection

Page 2 of 2

* Less than lower limits of detection

TABLE 1C
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
GASEOUS EFFLUENTS-GROUND-LEVEL RELEASES
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
Fission and Activation Gases:					
Krypton - 85	C1	*	*	*	*
Krypton - 85m	C1	3.76E-1	1.64E+0	*	*
Krypton - 87	C1	8.65E-1	3.86E+0	*	*
Krypton - 88	C1	9.30E-1	4.11E+0	*	*
Xenon - 131m	C1	*	*	*	*
Xenon - 133	C1	1.86E+0	2.66E+1	1.64E-5	1.91E-4
Xenon - 133m	C1	*	*	*	*
Xenon - 135	C1	1.67E+1	6.06E+1	6.34E-2	1.23E-1
Xenon - 153m	C1	9.42E+0	3.80E+1	2.32E-2	6.24E-2
Xenon - 138	C1	4.34E+0	2.11E+1	*	*
Other (Specify)	C1				
Argon - 41	C1	1.75E+0	6.38E+0	5.26E-6	2.12E-5
	C1				
	C1				
Total for Period	C1	3.62E+1	1.62E+2	8.65E-2	1.86E-1
	C1				
Iodines:	C1				
Iodine - 131	C1	6.62E-4	2.18E-3	2.61E-6	1.37E-5
Iodine - 132	C1	*	3.43E-5	1.04E-5	9.23E-5
Iodine - 133	C1	8.56E-3	3.09E-2	1.87E-5	1.07E-4
Iodine - 134	C1	*	*	9.70E-6	1.55E-4
Iodine - 135	C1	*	2.96E-5	2.06E-5	1.39E-4
	C1				
Total for Period	C1	9.22E-3	3.31E-2	6.20E-5	5.07E-4
	C1				
Particulates:	C1				
Strontium - 89	C1	*	2.98E-6		
Strontium - 90	C1	*	*		
Cesium - 134	C1	*	1.66E-5	8.18E-7	3.09E-6
Cesium - 137	C1	1.74E-5	6.56E-5	1.40E-6	5.79E-6
Barium - 140	C1	*	*	*	*
Other (Specify)	C1				
Lanthanum - 140	C1	*	*	*	*
Niobium - 95	C1	*	*	1.12E-7	9.31E-7
Iron - 55	C1	3.69E-10	4.27E-5		
Cobalt - 58	C1	3.20E-6	2.25E-6	5.50E-7	3.92E-6
Cobalt - 60	C1	4.81E-6	1.12E-5	*	3.16E-8

* Less than lower limits of detection

Page 2 of 2

* Less than lower limits of detection

TABLE 2A
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES
NORTH ANNA POWER STATION

	UNIT	1st QUARTER	2nd QUARTER	EST. TOTAL ERROR %
<u>A. Fission & Activation Products</u>				
1. Total release (not including tritium, gases, alpha)	Ci	1.34E-1	2.40E-1	1.50E+1
2. Average diluted concentration during period	µCi/ml	1.90E-10	3.38E-10	
3. Percent of applicable limit (T.S.)	%	4.55E-3	5.92E-3	
<u>B. Tritium</u>				
1. Total release activity.	Ci	4.37E+2	4.01E+2	1.50E+1
2. Average diluted concentration during period.	µCi/ml	6.21E-7	5.64E-7	
3. Percent of applicable limit (T.S.)	%	2.07E-2	1.88E-2	
<u>C. Dissolved and entrained gases</u>				
1. Total release activity.	Ci	6.05E-1	2.27E-1	1.50E+1
2. Average diluted concentration during period.	µCi/ml	8.59E-10	3.20E-10	
3. Percent of applicable limit (T.S.)	%	4.30E-4	1.60E-4	
<u>D. Gross Alpha Radioactivity</u>				
1. Total release activity.	Ci	<MDA	<MDA	1.50E+1
<u>E. Volume of waste released (prior to dilution)</u>				
	Liters	8.61E+7	7.69E+7	
<u>F. Volume of dilution water used during period</u>				
	Liters	7.04E+11	7.11E+11	

TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
LIQUID EFFLUENTS
NORTH ANNA POWER STATION

Page 1 of 2

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER	QUARTER	QUARTER	QUARTER
Fission and Activation Products					
Strontium - 89	C1	*	*		
Strontium - 90	C1	*	*		
Cesium - 134	C1	3.05E-2	5.50E-2	1.09E-5	*
Cesium - 137	C1	6.14E-2	1.16E-1	2.40E-5	5.69E-6
Iodine - 131	C1	6.32E-3	3.32E-3	3.36E-5	*
Cobalt - 58	C1	1.59E-2	3.66E-3	1.28E-5	2.81E-4
Cobalt - 60	C1	1.08E-2	2.32E-2	1.33E-6	1.49E-3
Iron - 59	C1	*	*	*	*
Zinc - 65	C1	*	*	*	*
Chromium - 51	C1	*	*	*	*
Manganese - 54	C1	*	5.67E-4	2.88E-8	8.79E-5
Niobium - 95	C1	*	1.12E-3	1.71E-8	1.77E-5
Zirconium - 95	C1	*	*	*	*
Molybdenum - 99	C1	*	*	*	*
Technetium - 99	C1	*	*	6.36E-6	*
Barium - 140	C1	*	*	*	*
Lanthanum - 140	C1	*	*	*	*
Cerium - 141	C1	*	*	*	*
Other (Specify)	C1				
Sodium - 24	C1	2.12E-3	1.40E-2	8.08E-6	*
Cobalt - 57	C1	*	*	1.26E-8	7.87E-6
Silver - 110m	C1	2.15E-4	5.46E-3	7.15E-8	5.26E-5
Antimony - 122	C1	1.93E-3	6.28E-3	2.94E-8	*
Iodine - 132	C1	*	*	1.19E-4	*
Iodine - 133	C1	3.33E-3	6.88E-3	2.16E-4	*
Iodine - 134	C1	*	*	1.20E-4	*
Iodine - 135	C1	*	1.72E-3	2.71E-4	*
Tellurium - 131m	C1	*	*	3.87E-6	*
Cesium - 138	C1	*	*	7.40E-5	*
Iron - 55	C1	*	*		
	C1				
	C1				
	C1				
	C1				
	C1				
	C1				
Total for Period	C1	1.33E-1	2.38E-1	9.01E-4	1.94E-3

* less than lower limits of detection

TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT (1985)
LIQUID EFFLUENTS
NORTH ANNA POWER STATION

[illegible]

* less than lower limits of detection

TABLE 3 (1/85 - 6/85)
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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

1. Type of Waste	UNIT	6-MONTH PERIOD	EST. TOTAL ERROR, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	1.24E+2 1.00E+2	1.0 E+1 1.0 E+1
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	1.40E+2 1.28E+1	1.0 E+1 1.0 E+1
c. Irradiated components, control rods, etc.	m ³ Ci	0. E 0. E	. E . E
d. Other (describe)	m ³ Ci	0. E 0. E	. E . E

2. Estimate of major nuclide composition (by type of waste)

a. H 3	%	38.6	1.0 E+1
Ni 63	%	22.4	1.0 E+1
Fe 55	%	12.95	1.0 E+1
Co 60	%	6.8	1.0 E+1
Cs 137	%	5.94	1.0 E+1
C 14	%	2.76	1.0 E+1
Cs 134	%	2.75	1.0 E+1
Cm 242	%	2.11	1.0 E+1
Co 58	%	1.72	1.0 E+1
Cm 244	%	1.02	1.0 E+1
Pu 241	%	1.01	1.0 E+1
I 131	%	.8	1.0 E+1
Mn 54	%	.71	1.0 E+1
Sb 122	%	.13	1.0 E+1
Pu 239	%	.08	1.0 E+1
Ce 144	%	.04	1.0 E+1
La 140	%	.03	1.0 E+1
Ba 140	%	.03	1.0 E+1
Sr 90	%	.01	1.0 E+1
Xe 133	%	.01	1.0 E+1
Nb 95	%	.007	1.0 E+1
Zr 95	%	.003	1.0 E+1
Pu 238	%	.002	1.0 E+1
Tc 99	%	.001	1.0 E+1
I 129	%	.0006	1.0 E+1
	%		. E
b.	%		. E
Fe 55	%	51.05	1.0 E+1
H 3	%	15.1	1.0 E+1
Co 60	%	10.4	1.0 E+1

ATTACHMENT 2

(01/85-06/85)

REVISIONS TO OFFSITE CALCULATION

MANUAL (ODCM)

No changes were made to the Offsite Dose Calculation
Manual (ODCM) for the time period covered by this report.

ATTACHMENT 3

(01/85-06/85)

REVISIONS TO PROCESS CONTROL PROGRAM (PCP)

No changes were made to the Process Control Program
(PCP) for the time period covered by this report.

ATTACHMENT 4

(01/85-06/85)

MAJOR CHANGES TO RADIOACTIVE SOLID

WASTE TREATMENT SYSTEMS

No major changes to the radioactive solid waste treatment systems were made for the time period covered by this report.

ATTACHMENT 5

(01/85-06/85)

RADIOACTIVE LIQUID AND GASEOUS

EFFLUENT MONITORING INSTRUMENTATION INOPERABLE

None of the radioactive effluent monitors met the requirements of Technical Specification 3.3.3.10.b and 3.3.3.11.b, for providing an account due to inoperability.

ATTACHMENT 6

(01/85-06/85)

UNPLANNED RELEASES

No unplanned releases, as defined according to the criteria presented in 10 CFR Part 50.73, occurred during the time period covered by this report.

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

August 30, 1985

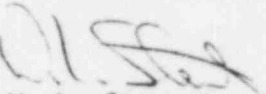
Dr. J. Nelson Grace
Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

Serial No. 85-625
NOHP/FLT:pb
Docket Nos. 50-338 *D*
50-339
License Nos. NPF-4
NPF-7

Dear Dr. Grace:

Enclosed is the Radioactive Effluent Release Report for North Anna Power Station for the period January 1, 1985 to June 30, 1985.

Very truly yours,


W. L. Stewart

Enclosure (2 copies)

cc: Mr. Edward J. Butcher, Acting Chief
Operating Reactors Branch No. 3
Division of Licensing

Mr. M. W. Branch
NRC Resident Inspector
North Anna Power Station

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Certified By *Barbara Scott*
85-101
1625 *11*