PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72

ATTACHMENT A

RADIOACTIVE EFFLUENT RELEASE REPORT 2003

RADIOACTIVE EFFLUENT

RELEASE REPORT

2003

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

Facility Operating License No. DPR-72

Docket No. 50-302

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Date: 4/21/04

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INTRODUCTION

This report is submitted as required by the Offsite Dose Calculation Manual, section 6.5, and Technical Specfications 5.6.2.3.3 and 5.7.1.1.c.

The scope of this report includes:

- A summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the plant.
- Quarterly and annual dose summaries.
- A list and description of unplanned releases to unrestricted areas.
- A description of any changes to the:

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

- Significant changes to any radioactive waste treatment system.
- A list of new dose calculation location changes identified by the annual land-use census.
- Information relating to effluent monitors or required supporting instrumentation being inoperable for 30 or more days.

TABLE 1

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1	Quarter 2	Est. Total Error %
A. Fission and activation gases				
1. Total release	Ci	4.16E+00	8.09E+00	30
2. Average release rate for period	μCi/sec	5.35E-01	1.03E+00	
3. Percent of technical specification limit	%	5.30E-03	7.98E-03	
B. Iodines				
1. Total Iodine-131	Ci	1.21E-06	5.47E-07	30
2. Average release rate for period	μCi/sec	1.55E-07	6.96E-08	
3. Percent of technical specification limit	%	1.20E-02	8.57E-03	
C. Particulates*				
1. Particulates with half-lives > 8 days	Ci	0.00E+01	1.63E-07	30
2. Average release rate for period	μCi/sec	0.00E+01	2.08E-08	
3. Percent of technical specification limit	%	0.00E+01	8.57E-3	
4. Gross alpha radioactivity	Ci	0.00E+01	0.00E+01	
D. Tritium				
1. Total release	Ci	5.37E-01	1.23E+00	30
2. Average release rate for period	μCi/sec	6.90E-02	1.56E-01	
3. Percent of technical specification limit	%	1.20E-2	8.57E-3	

* The sum of the particulates reported on this page may be less than the sum from Table 2, as Table 2 includes all particulates, while this table includes only those with half-lives greater than 8 days.

TABLE 2

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	**Unit**	**Quarter 1**	**Quarter 2**	**Quarter 1**	**Quarter 2**
A. Fission gases					
Argon-41	Ci				
Krypton-85	Ci			2.37E+00	1.45E+00
Krypton-85m	Ci				
Krypton-87	Ci				
Krypton-88	Ci				
Xenon-131m	Ci		4.17E+00	4.93E-03	1.52E-02
Xenon-133	Ci	1.30E+00	1.87E+00	3.52E-01	5.95E-01
Xenon-133m	Ci			1.77E-03	1.61E-03
Xenon-135	Ci	1.31E-01		2.23E-04	4.23E-04
Xenon-135m	Ci				
Xenon-138	Ci				
Total for period	Ci	1.43E+00	6.04E+00	2.72E+00	2.06E+00
B. Iodines					
Iodine-131	Ci	1.21E-06	5.47E-07		
Iodine-132	Ci				
Iodine-133	Ci				
Iodine-135	Ci				
Total for period	Ci	1.21E-06	5.47E-07	0.00E+00	0.00E+00
C. Particulates					
Zinc-72	Ci				
Cobalt-58*	Ci				
Cobalt-60*	Ci				
Strontium-89*	Ci				
Strontium-90*	Ci				
Niobium-95m	Ci				
Technicium-99m	Ci				
Tellurium-132	Ci				
Cesium-134*	Ci				
Cesium-137*	Ci		9.16E-08		
Cesium-138	Ci				
Barium-139	Ci				
Lanthanum-142	Ci				
Cerium-141*	Ci		7.17E-08		
Cerium-144*	Ci				
Rhenium-188	Ci				
Total for period	Ci	0.00E+00	1.63E-07	0.00E+00	0.00E+00

* > 8 day half-life

TABLE 3

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 3	Quarter 4	Est. Total Error %
A. Fission and activation gases				
1. Total release	Ci	8.24E+01	6.88E+01	30
2. Average release rate for period	μCi/sec	1.04E+01	8.65E+00	
3. Percent of technical specification limit	%	1.16E-01	6.59E-02	
B. Iodines				
1. Total Iodine-131	Ci	0.00E+00	2.20E-05	30
2. Average release rate for period	μCi/sec	0.00E+00	2.76E-06	
3. Percent of technical specification limit	%	0.00E+00	1.98E-01	
C. Particulates*				
1. Particulates with half-lives > 8 days	Ci	2.66E-10	5.94E-08	30
2. Average release rate for period	μCi/sec	3.34E-11	7.48E-09	
3. Percent of technical specification limit	%	5.71E-03	1.98E-01	
4. Gross alpha radioactivity	Ci	2.05E-08	0.00E+00	
D. Tritium				
1. Total release	Ci	1.78E+00	3.72E+00	30
2. Average release rate for period	μCi/sec	2.24E-01	4.68E-01	
3. Percent of technical specification limit	%	5.71E-03	1.98E-01	

* The sum of the particulates reported on this page may be less than the sum from Table 4, as Table 4 includes all particulates, while this table includes only those with half-lives greater than 8 days.

TABLE 4

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

GASEOUS EFFLUENTS - GROUND LEVEL RELEASES

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	**Unit**	**Quarter 3**	**Quarter 4**	**Quarter 3**	**Quarter 4**
A. Fission gases					
Argon-41	Ci				
Krypton-85	Ci	6.37E+01		2.51E+00	1.13E+01
Krypton-85m	Ci			1.91E-03	1.43E-03
Krypton-87	Ci				
Krypton-88	Ci			1.81E-03	
Xenon-131m	Ci	2.17E+00		8.91E-02	5.71E-01
Xenon-133	Ci	1.31E+00	4.65E+01	1.24E+01	9.47E+00
Xenon-133m	Ci		6.71E-01	1.77E-01	9.14E-03
Xenon-135	Ci		2.21E-01	1.07E-01	9.10E-02
Xenon-135m	Ci				
Xenon-138	Ci				
Total for period	Ci	6.71E+01	4.74E+01	1.53E+01	2.14E+01
B. Iodines					
Iodine-131	Ci		2.14E-05		5.74E-07
Iodine-132	Ci				
Iodine-133	Ci				2.00E-07
Iodine-135	Ci				
Total for period	Ci	0.00E+00	2.14E-05	0.00E+00	7.74E-07
C. Particulates					
Zinc-72	Ci				
Cobalt-57*	Ci		5.94E-08	2.66E-10	
Chromium-51*	Ci				
Strontium-89*	Ci				
Strontium-90*	Ci				
Niobium-95m	Ci				
Tin-113*	Ci				
Indium-113m	Ci				
Barium-133m	Ci				
Cesium-137*	Ci				
Cesium-138	Ci				
Barium-139	Ci				
Lanthanum-142	Ci				
Cerium-141	Ci				
Cerium-143	Ci				
Cerium-144*	Ci				
Rhenium-188	Ci				
Total for period	Ci	0.00E+00	5.940E-08	2.66E-10	0.00E+00

* > 8 day half-life

TABLE 5

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

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	9.88E-04	1.52E-02	25
2. Average diluted concentration during period	μCi/ml	1.74E-12	2.56E-11	
3. Percent of applicable limit	%	5.68E-04	4.22E-04	
B. Tritium				
1. Total release	Ci	2.04E+02	3.13E+02	30
2. Average diluted concentration during period	μCi/ml	3.59E-07	5.27E-07	
3. Percent of applicable limit	%	2.93E-02	4.61E-02	
C. Dissolved and entrained gases				
1. Total release	Ci	1.25E-02	2.81E-02	25
2. Average diluted concentration during period	μCi/ml	2.20E-11	4.73E-11	
3. Percent of applicable limit	%	1.87E-04	4.56E-04	
D. Gross alpha radioactivity				
1. Total release	Ci	1.86E-05	6.62E-05	30
E. Volume of waste released (prior to dilution)				
1. Batch and continuous modes	Liters	6.75E+06	6.31E+06	10
F. Volume of dilution water used during period				
1. Batch and continuous modes	Liters	5.67E+11	5.94E+11	10

TABLE 6

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
Fission and activation products	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
Sodium-24	Ci				
Chromium-51	Ci			7.90E-06	
Manganese-54	Ci				1.79E-04
Manganese-56	Ci				
Iron-55	Ci			2.61E-04	3.08E-04
Iron-59	Ci				
Cobalt-57	Ci				
Cobalt-58	Ci			5.96E-07	1.43E-05
Cobalt-60	Ci			1.93E-04	2.44E-03
Zinc-72	Ci				
Strontium-85	Ci				
Strontium-89	Ci				
Strontium-90	Ci				
Yttrium-91m	Ci				
Yttrium-92	Ci				
Yttrium-93	Ci				
Niobium-95	Ci				5.39E-06
Niobium-95m	Ci				
Niobium-97	Ci				
Zirconium-95	Ci				
Zirconium-97	Ci				
Molybdinum-99	Ci				
Technetium-99m	Ci			2.37E-06	
Technetium-101	Ci				
Ruthenium-103	Ci				
Ruthenium-106	Ci				
Silver-110m	Ci			4.19E-05	1.07E-02
Tin-113	Ci				
Indium-113m	Ci				
Antimony-122	Ci			1.33E-07	
Antimony-124	Ci				
Antimony-125	Ci			2.68E-04	1.54E-03
Tellurium-129	Ci				
Tellurium-132	Ci				
Iodine-131	Ci			1.62E-06	1.61E-06
Iodine-133	Ci			1.39E-06	7.24E-07
Iodine-135	Ci				
Cesium-134	Ci			3.14E-06	9.01E-07
Cesium-137	Ci			2.02E-04	2.63E-05
Cesium-138	Ci				
Barium-139	Ci			5.14E-06	9.63E-06
Barium-140	Ci				
Lanthanum-140	Ci				
Cerium-143	Ci				
Cerium-144	Ci				
Neodymium-147	Ci				1.05E-06
Tungsten-187	Ci				
Neptunium--239	Ci				
Total for period	Ci	0.00E+00	0.00+00	9.88E-04	1.52E-02

TABLE 6 (CONTINUED)

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
Dissolved and entrained gases	Unit	Quarter 1	Quarter 2	Quarter 1	Quarter 2
Argon-41	Ci				
Krypton-85	Ci			4.61E-03	1.87E-03
Krypton-85m	Ci				
Krypton-87	Ci				
Krypton-88	Ci				
Xenon-131m	Ci			5.00E-05	5.73E-05
Xenon-133	Ci			7.61E-03	2.57E-02
Xenon-133m	Ci			5.51E-05	9.81E-05
Xenon-135	Ci			1.99E-04	3.82E-04
Xenon-135m	Ci				
Total for period	Ci	0.00E+00	0.00E+00	1.25E-02	2.81E-02

Tritium	Ci	0.00E+00	0.00E+00	2.04E+02	3.13E+02

TABLE 7

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

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	1.15E-02	6.15E-03	25
2. Average diluted concentration during period	μCi/ml	1.84E-11	1.07E-11	
3. Percent of applicable limit	%	3.32E-04	5.20E-04	
B. Tritium				
1. Total release	Ci	1.51E+02	3.28E+01	30
2. Average diluted concentration during period	μCi/ml	2.42E-07	5.71E-07	
3. Percent of applicable limit	%	3.96E-01	2.71E-01	
C. Dissolved and entrained gases				
1. Total release	Ci	1.26E-01	8.78E-01	25
2. Average diluted concentration during period	μCi/ml	2.02E-10	1.53E-09	
3. Percent of applicable limit	%	1.63E-03	1.68E-03	
D. Gross alpha radioactivity				
1. Total release	Ci	2.27E-04	1.98E-04	30
E. Volume of waste released (prior to dilution)				
1. Batch and continuous modes	Liters	7.45E+06	9.43E+06	10
F. Volume of dilution water used during period				
1. Batch and continuous modes	Liters	6.23E+11	5.74E+11	10

TABLE 8

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
Fission and activation products	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
Sodium-24	Ci				
Chromium-51	Ci			8.70E-05	5.28E-05
Manganese-54	Ci			5.50E-06	2.53E-06
Manganese-56	Ci				
Iron-55	Ci			7.35E-04	6.40E-04
Iron-59	Ci				
Cobalt-57	Ci				
Cobalt-58	Ci			7.79E-05	1.39E-03
Cobalt-60	Ci			3.92E-04	1.40E-04
Zinc-69	Ci				
Zinc-72	Ci				
Strontium-85	Ci				
Strontium-89	Ci				
Strontium-90	Ci				
Strontium-92	Ci				
Yttrium-91	Ci				
Yttrium-92	Ci				
Yttrium-93	Ci				
Rubidium-88	Ci				
Niobium-95	Ci			1.36E-06	2.83E-05
Zirconium-95	Ci			5.33E-06	1.91E-06
Zirconium-97	Ci				
Molybdinum-99	Ci				
Technetium-99m	Ci			6.43E-06	
Technetium-101	Ci				
Ruthenium-106	Ci			3.75E-05	1.50E-05
Silver-110m	Ci			9.96E-04	3.79E-04
Tin-113	Ci				
Indium-113m	Ci				
Antimony-122	Ci				
Antimony-124	Ci				2.41E-06
Antimony-125	Ci			8.94E-03	3.32E-03
Tellurium-129	Ci				
Tellurium-132	Ci				
Iodine-131	Ci		2.52E-05	6.97E-05	4.66E-05
Iodine-132	Ci				
Iodine-133	Ci			3.32E-05	3.15E-06
Iodine-135	Ci				
Cesium-134	Ci			2.99E-07	3.74E-06
Cesium-136	Ci				
Cesium-137	Ci			1.66E-05	2.89E-05
Barium-133m	Ci			3.53E-05	
Barium-139	Ci			3.26E-05	4.09E-05
Barium-140	Ci				
Lanthanum-140	Ci				
Cerium-141	Ci			1.54E-05	2.63E-07
Cerium-144	Ci				
Praseodymium-144	Ci				
Neodymium-147	Ci				
Rhenium-188	Ci				
Total for period	Ci	0.00E+00	2.52E-05	1.15E-02	6.13E-03

TABLE 8 (CONTINUED)

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

LIQUID EFFLUENTS

		CONTINUOUS MODE		BATCH MODE	
Dissolved and entrained gases	Unit	Quarter 3	Quarter 4	Quarter 3	Quarter 4
Argon-41	Ci				
Krypton-85	Ci		1.15E-02	7.21E-03	7.84E-02
Krypton-85m	Ci			2.23E-06	1.66E-07
Krypton-87	Ci			1.93E-05	
Krypton-88	Ci				
Xenon-131m	Ci			2.08E-03	2.34E-02
Xenon-133	Ci			1.14E-01	7.58E-01
Xenon-133m	Ci			1.05E-03	5.49E-03
Xenon-135	Ci			1.61E-03	9.72E-04
Xenon-135m	Ci				
Total for period	Ci	0.00E+00	1.15E-02	1.26E-01	8.66E-01

Tritium	Ci	0.00E+00	2.05E-02	1.51E+02	3.28E+01

TABLE 9

EFFLUENT AND WASTE DISPOSAL REPORT - 2003

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR PROCESSING OR BURIAL (Non-irradiated fuel)

1. Type of waste	Unit	12 month period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m3 Ci	4.22E+01 1.63E+02	25
b. Dry compressible waste, contaminated equipment, etc.	m3 Ci	2.98E+02 4.94E-01	25
c. Irradiated components, control rods, etc.	m3 Ci	0.00E+00 0.00E+00	25
d. Other (describe): Liquid Radwaste Resins	m3 Ci	5.83E+00 6.99E+00	25

2. Estimate of major nuclide composition (by type of waste in %)*			
a.	Ni-63 24.4 Cs-137 26.9 Co-60 13.6	Cs-134 16.2 Fe-55 16.9	
b.	Fe-55 23.5 Ni-63 11.6 Co-60 21.4	Cs-137 15.1 Sb-125 4.9 Ag-110m 10.5	Cs-134 3.5 H-3 4.1
c.			
d.	Fe-55 31.8 Co-60 8.5 Cs-137 10.7	Ni-63 34.9 Cs-134 7.8 Sb-125 3.0	

* Curie values and principle radionuclides are estimates based on a combination of direct and indirect methods.

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation *	Destination
1	Hittman	Barnwell Waste Mngmt (SC)
4	Hittman	Duratek (TN)
1	Tri-State Motor Transit	Duratek (TN)
2	Southern Pines Trucking	Envirocare (UT)
1	Hittman	Studsvik Processing Facility (TN)
1	TAG Transport	Studsvik Processing Facility (TN)

* All exclusive use trucks

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

Unplanned Releases

There were no unplanned releases in 2003.

Radioactive Waste Treatment Systems

There were no significant changes to the radioactive waste treatment systems.

Annual Land Use Census

The 2003 land-use census did not identify any new dose calculation locations.

Effluent Monitor Instrument Operability

Required effluent monitor instrumentation was not out of service for more than 30 days during 2003.

ODCM & PCP Changes

The ODCM was revised during 2003. The primary reason for the change was to make the ODCM consistent with ITS in regards to operability of RM-A1 (containment purge effluent monitor). A complete copy of the ODCM is being submitted with this report.

The PCP was not revised during 2003.

Emergency Feed Pump 2

Emergency Feed Pump 2 (EFP-2) overspeed testing is performed quarterly using steam from CR-3's steam generators. Due to a small primary to secondary leak, an evaluation was performed to estimate the quantity of radioactive material which was released during 2003 due to operation of this pump. The results of this evaluation are given below in units of Curies/year.

Xe-133	9.00E-07	I-131	6.00E-08	Cs-134	6.00E-08
Xe-135	3.00E-07	I-133	9.00E-08	Cs-137	3.00e-08
H-3	2.4E-06				

These values are not included in Tables 1 through 4.

Errors in Past Reports

The ODCM previously required that "container type" be included as part of the information compiled for solid radwaste shipments. This information was omitted in effluent reports for 1998 through 2002 (ref. NCR 100631). The following data is being submitted as supplements to those reports.

1998:	Type a wastes were shipped in liners.
	Type b wastes were shipped in strong tight containers.
1999:	Type a wastes were shipped in liners and strong tight containers.
	Type b and d wastes were shipped in strong tight containers.
2000:	Type a wastes were shipped in liners and strong tight containers.
	Type b, c, and d wastes were shipped in strong tight containers.
2001:	Type a wastes were shipped in liners and strong tight containers.
	Type b wastes were shipped in strong tight containers.
2002:	Type a wastes were shipped in liners and strong tight containers.
	Type b and d wastes were shipped in strong tight containers.

2003 Appendix I Dose Summary

Maximum Hypothetical Individual

Liquid Effluent Dose Limits

Total Body:	1.5 mrem/quarter, 3 mrem/year
Any Organ:	5 mrem/quarter, 10 mrem/year

Liquid Effluent Dose Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Total
Total Body Dose (mrem)	8.51E-06	6.33E-06	4.98E-06	2.67E-06	2.25E-05
Maximum Organ Dose (mrem)	5.58E-06	3.35E-04	6.08E-05	2.60E-05	4.28E-04
Maximum Organ was GI					

Gaseous Effluent Dose Limits

Gamma Air Dose:	5 mrad/quarter, 10 mrad/year
Beta Air Dose:	10 mrad/quarter, 20 mrad/year
Any Organ:	7.5 mrem/quarter, 15 mrem/year

Gaseous Release Dose Summary

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Total
Gamma Air Dose (mrad)	6.95E-05	1.23E-04	5.23E-04	1.65E-03	2.37E-03
Beta Air Dose (mrad)	5.30E-04	7.98E-04	1.16E-02	6.60E-03	1.95E-02
Total Body Dose (mrem)	1.30E-04	3.00E-04	4.30E-04	9.12E-04	1.77E-03
Maximum Organ Dose (mrem)	8.97E-04	6.43E-04	4.28E-04	1.49E-02	1.68E-02
Maximum Organ was Thyroid					