NINE MILE POINT NUCLEAR STATION - UNIT 2

SEMI-ANNUAL RADIOACTIVE EFFLUENT

RELEASE REPORT

JANUARY - JUNE 1988

DOCKET NO.: 50-410

LICENSE NO.: NPF-69

NIAGARA MOHAWK POWER CORPORATION

8809070083 880830
PDR ADOCK 05000410
R PNU

NINE MILE POINT NUCLEAR STATION - UNIT 2

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JANUARY - JUNE 1988

Facility: Nine Mile Point Unit #2 Licensee: Niagara Mohawk Power Corporation

1. Technical Specification Limits:

A) Fission and activation gases:

1. The dose rate limit of noble gases from the site to areas at and beyond the site boundary shall be less than or equal to 500 mrem/year to the whole body and less than or equal to 3000 mrem/year to the skin.

2. The air dose from noble gases released in gaseous effluents from the Nine Mile Point 2 Station to areas at and beyond the site boundary shall be limited during any calendar quarter to less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation and, during any calendar year to less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

B&C) Tritium, Iodines and Particulates, half lives > 8 days:

1. The dose rate limit of Iodine-131, Iodine-133, Tritium and all radionuclides in particulate form with half-lives greater than eight days, released gaseous effluents from the site to areas at or beyond the site boundary, shall be less than or equal to 1500 mrem/year to any organ.

2. The dose to a member of the public from Iodine-131, Iodine-133, Tritium and all radionuclides in particulate form with half lives greater than 8 days as part of gaseous effluents released from the Nine Mile Point 2 Station to areas at and beyond the site boundary shall be limited during any calendar quarter to less than or equal to 7.5 mrem to any organ and, during any calendar year to less than or equal to 15 mrem to any organ.

D) Liquid Effluents

1. 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 gas, the concentration shall be limited to 2E-04 microcuries/ml total activity.

D. Liquid Effluents (Cont'd)

2. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released from Nine Mile Point Unit 2 to unrestricted areas shall be limited during any calendar quarter to less than or equal to 1.5 mrem to the whole body and to less than or equal to 5 mrem to any organ, and during any calendar year to less than or equal to 3 mrem to the whole body and to less than or equal to 10 mrem to any organ.

2. Maximum Permissible Concentrations

A) Fission and activation gases:

None specified

B&C) Iodines and particulates, half lives $\geq$ 8 days:

None specified

D) Liquid Effluents:

10CFR 20, Appendix B, Table II, Column 2.
Avg Fraction MPC (Jan. - March) = 5.86E-2
Avg Fraction MPC (April - June) = 1.94E-3

3. Average Energy (Fission and Activation gases - Mev)

Jan. - March: $\overline{E}$ = 0.988; $\overline{E}_\beta$ = 0.498
Oct. - Dec.: $\overline{E}$ = 0.904; $\overline{E}_\beta$ = 0.784

4. Measurements and Approximations of Total Radioactivity

Described below are the methods used to measure or approximate the total radioactivity and radionuclide composition in effluents.

A) Fission and Activation Gases: Noble gas effluent activity is determined by on-line gamma spectroscopic monitoring (intrinsic germanium crystal) of an isokinetic sample stream.

B) Iodines: Iodine effluent activity is determined by gamma spectroscopic analysis (at least weekly) of charcoal cartridges manually or automatically sampled from an isokinetic sample stream.

C) Particulates: Activity released is determined by gamma spectroscopic analysis (at least weekly) of particulate filters manually or automatically sampled from an isokinetic sample stream.

4. (Cont'd)

D) Tritium: Tritium effluent activity is measured by liquid scintillation or gas proportional counting of monthly samples taken with an air sparging/water trap apparatus.

E) Liquid Effluents: Isotopic Analysis of a representative sample of each batch.

F) Solid Effluents: Isotopic contents of waste shipments are determined by gamma spectroscopy and water content analyses of a representative sample of each batch. Scaling factors established from primary composite sample analyses conducted off-site are applied, where appropriate, to find estimated concentration of non-gamma emitters. For low activity trash shipments, curie content is estimated by dose rate measurement and application of appropriate scaling factors.

5. Batch Releases

The following information relates to batch releases of radioactive materials in liquid and gaseous effluents.

A) Liquid -

1.	Number of batch releases: 131				
2.	Total time period for batch releases:	444	hours	30	min.
3.	Maximum time period for a batch release:	3	hours	28	min.
4.	Average time period for a batch release:	3	hours	24	min.
5.	Minimum time period for a batch release:	3	hours	12	min.
6.	Average stream flow during period of release of effluent into a flowing stream:	Not Applicable			
7.	Total volume of water used to dilute the liquid effluent during release periods :	2.25 E9 liters			
8.	Total volume of water available to dilute the liquid effluent during reporting period :	2.25 E10 liters			

B) Gaseous (Primary Containment Purge)

1.	Number of batch releases:	9	
2.	Total time period for batch releases:	128.6	hours
3.	Maximum time period for a batch release:	38.2	hours
4.	Average time period for a batch release:	14.3	hours
5.	Minimum time period for a batch release:	7.8	hours

6. Abnormal Releases

A. Liquids - none

B. Gaseous - none

TABLE 1A

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES
ELEVATED AND GROUND LEVEL

JANUARY - JUNE 1988

		UNIT	1st QUARTER	2nd QUARTER	EST.TOTAL ERROR, %
A.	Fission & Activation gases				
	1. Total release	Ci	6.52E+00	2.85E+01	5.0E+01
	2. Average release rate for period	µCi/sec	8.29E-01	3.62E+00	
	3. Percent of Technical Specification Limit	%	*	*	
B.	Iodines				
	1. Total iodine-131	Ci	1.33E-05	2.79E-06	5.0E+01
	2. Average release rate for period	µCi/sec	1.69E-06	3.55E-07	
	3. Percent of Technical Specification Limit	%	*	*	
C.	Particulates				
	1. Particulates with half-lives | 8 days	Ci	6.03E-05	5.54E-05	5.0E+01
	2. Average release rate for period	µCi/sec	7.67E-06	7.05E-06	
	3. Percent of Technical Specification Limit	%	*	*	
	4. Gross alpha radio-activity	Ci	3.05E-06	6.03E-06	5.0E+01
D.	Tritium				
	1. Total release	Ci	1.05E+00	1.60E+00	5.0E+01
	2. Average release rate for period	µCi/sec	1.34E-01	2.04E-01	
	3. Percent of Technical Specification Limit	%	*	*	

*See Item E attached.

TABLE 1A
(Continued)

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES
ELEVATED AND GROUND LEVEL

JANUARY - JUNE

	UNIT	1st QUARTER	2nd QUARTER
E. Percent of Technical Specification Limits			
Fission and Activation Gases:			
1. Percent of Quarterly Gamma Air Dose Limit	%	5.18E-02	2.13E-01
2. Percent of Quarterly Beta Air Dose Limit	%	3.68E-04	3.12E-03
3. Percent of Annual Gamma Air Dose Limit to Date	%	2.59E-02	1.33E-01
4. Percent of Annual Beta Air Dose Limit to Date	%	1.84E-04	1.75E-03
5. Percent of Whole Body Dose Rate Limit	%	2.00E-03	8.19E-03
6. Percent of Skin Dose Rate Limit	%	3.87E-04	1.61E-03
Tritium, Iodines and Particulates (with half-lives greater than 8 days):			
1. Percent of Quarterly Dose Limit	%	1.33E-03	3.61E-04
2. Percent of Annual Dose Limit to Date	%	6.67E-04	8.47E-04
3. Percent of Organ Dose Rate Limit	%	5.06E-05	1.04E-05

TABLE 1B

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
GASEOUS EFFLUENTS-ELEVATED (STACK)

JANUARY - JUNE

Nuclides Released	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 2nd Quarter
1. Fission Gases					
Argon-41	Ci	2.28E-01	5.36E-00	-------	-------
Krypton-85m	Ci	1.20E-01	2.10E-01	-------	-------
Krypton-87	Ci	-------	7.57E-01	-------	-------
Krypton-88	Ci	-------	4.71E-01	-------	-------
Xenon-133	Ci	-------	-------	-------	-------
Xenon-135	Ci	8.84E-02	2.49E-01	-------	-------
Xenon-135m	Ci	1.06E-00	1.91E-00	-------	-------
Xenon-137	Ci	-------	5.71E-00	-------	-------
Xenon-138	Ci	5.02E-00	1.33E+01	-------	-------
2. Iodines					
Iodine-131	Ci	1.33E-05	2.79E-06	-------	-------
Iodine-133	Ci	1.98E-04	1.35E-06	-------	-------
Iodine-135	Ci	-------	-------	-------	-------
3. Particulates					
Strontium-89	Ci	5.96E-05	#	-------	-------
Strontium-90	Ci	-------	#	-------	-------
Strontium-91	Ci	-------	1.84E-05	-------	-------
Cesium-134	Ci	-------	-------	-------	-------
Cesium-137	Ci	6.90E-07	1.83E-06	-------	-------
Cobalt-60	Ci	-------	-------	-------	-------
Cobalt-58	Ci	-------	-------	-------	-------
Manganese-54	Ci	-------	-------	-------	-------
Barium-Lanthanum-140	Ci	-------	7.32E-06	-------	-------
Antimony-125	Ci	-------	-------	-------	-------
Niobium-95	Ci	-------	-------	-------	-------
Cerium-141	Ci	-------	-------	-------	-------
Cerium-144	Ci	-------	-------	-------	-------
Iron-59	Ci	-------	-------	-------	-------
Cesium-136	Ci	-------	-------	-------	-------
Chromium-51	Ci	-------	-------	-------	-------
Zinc-65	Ci	-------	-------	-------	-------
Iron-55	Ci	-------	#	-------	-------
4. Tritium	Ci	2.54E-01	5.95E-01	4.77E-01	6.85E-01

Sr89, 90 and Fe-55 analysis results have not been received yet, 1.79E-06 Ci of Sr89 was released during the fourth quarter of 1987 from the stack in a continuous mode.

TABLE 1C

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
GASEOUS EFFLUENTS-COMBINED GROUND LEVEL-ELEVATED (REACTOR BUILDING VENT)

JANUARY - JUNE

Nuclides Released	Unit	CONTINUOUS MODE 1st Quarter	CONTINUOUS MODE 2nd Quarter	BATCH MODE 1st Quarter	BATCH MODE 2nd Quarter
1. Fission Gases					
Argon-41	Ci	-------	-------	-------	-------
Krypton-85	Ci	-------	2.06E-04	-------	-------
Krypton-85m	Ci	-------	-------	-------	-------
Krypton-87	Ci	-------	-------	-------	-------
Krypton-88	Ci	-------	-------	-------	-------
Xenon-133	Ci	-------	2.19E-05	-------	-------
Xenon-135	Ci	-------	4.96E-01	-------	-------
Xenon-135m	Ci	-------	-------	-------	-------
Xenon-137	Ci	-------	-------	-------	-------
Xenon-138	Ci	-------	-------	-------	-------
2. Iodines					
Iodine-131	Ci	-------	-------	-------	-------
Iodine-133	Ci	-------	-------	-------	-------
Iodine-135	Ci	-------	-------	-------	-------
3. Particulates					
Strontium-89	Ci	-------	#	-------	-------
Strontium-90	Ci	-------	#	-------	-------
Cesium-134	Ci	-------	-------	-------	-------
Cesium-137	Ci	-------	-------	-------	-------
Cobalt-60	Ci	-------	-------	-------	-------
Cobalt-58	Ci	-------	-------	-------	-------
* Manganese-54	Ci	-------	-------	-------	-------
Barium-Lanthanum-140	Ci	-------	-------	-------	-------
Antimony-125	Ci	-------	-------	-------	-------
Niobium-95	Ci	-------	-------	-------	-------
Cerium-141	Ci	-------	-------	-------	-------
Cerium-144	Ci	-------	-------	-------	-------
Iron-59	Ci	-------	-------	-------	-------
Cesium-136	Ci	-------	-------	-------	-------
Chromium-51	Ci	-------	4.31E-05	-------	-------
Zinc-65	Ci	-------	3.14E-06	-------	-------
Iron-55	Ci	-------	#	-------	-------
Technictium-Molybdenum-99	Ci	-------	6.88E-05	-------	-------
4. Tritium	Ci	3.21E-01	3.24E-01	-------	-------

Sr89, 90 and Fe-55 results have not been received yet, None of these nuclides were released from the vent during the fourth quarter of 1987.

* Mn-54 release was erroneously reported in the last semiannual report for the stack continous 4th quarter of 1987 as 5.17 Ci. Correct value should have been 1.32E-6 Ci.

TABLE 2A

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

JANUARY - JUNE

	Unit	1st Quarter	2nd Quarter	Est. Total Error, %
A. Fission and activation products				
1. Total release (not including tritium, gases, alpha)	Ci	2.72E-00	2.36E-01	5.00E+1
2. Average diluted concentration during reporting period	µCi/ml	2.95E-06	1.77E-07	
3. Percent of applicable limit	%	5.80E-00	1.44E-01	
B. Tritium				
1. Total release	Ci	1.61E-00	2.03E-00	5.00E+1
2. Average diluted concentration during reporting period	µCi/ml	1.75E-06	1.53E-06	
3. Percent of applicable limit	%	5.83E-02	5.10E-04	
C. Dissolved and entrained gases				
1. Total release	Ci	2.75E-04	9.35E-05	5.00E+1
2. Average diluted concentration during reporting period	µCi/ml	2.99E-10	7.02E-11	
3. Percent of applicable limit	%	1.49E-04	3.51E-05	
D. Gross alpha radioactivity				
1. Total release	Ci	-------	-------	-------
E. Volumes				
1. Prior to dilution	liters	6.22E+06	5.90E+06	5.00E+1
2. Volume of dilution water used during release period	liters	9.20E+08	1.33E+09	5.00E+1
3. Volume of dilution water used during reporting period	liters	8.90E+09	1.36E+10	5.00E+1

TABLE 2A
(Continued)

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

JANUARY - JUNE

		Unit	1st Quarter	2nd Quarter
F.	Percent of Technical Specification Limits			
1.	Percent of Quarterly Whole Body Dose Limit	%	1.86E+01	2.49E+00
2.	Percent of Quarterly Organ Dose Limit (GI-LLI)	%	1.95E+01	1.32E+00
3.	Percent of Annual Whole Body Dose Limit to Date	%	9.29E+00	1.05E+01
4.	Percent of Annual Organ Dose Limit to Date (GI-LLI)	%	9.77E+00	1.04E+01
5.	Percent of 10CFR20 Concentration Limit	%	5.86E+00	1.95E-01
6.	Percent of Dissolved or Entrained Noble Gas Limit	%	1.49E-04	3.51E-05

TABLE 2B

RADIOACTIVE EFFLUENT RELEASE SEMI-ANNUAL REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
LIQUID EFFLUENTS RELEASED
JANUARY - JUNE

		CONTINUOUS MODE		BATCH MODE	
	Unit	1st Quarter	2nd Quarter	1st Quarter	2nd Quarter
Nuclides Released					
Strontium-89	Ci	-------	-------	-------	-------
Strontium-90	Ci	-------	-------	-------	-------
Cesium-134	Ci	-------	-------	-------	-------
Cesium-137	Ci	-------	-------	-------	-------
Iodine-131	Ci	-------	-------	-------	-------
Cobalt-58	Ci	-------	-------	6.89E-01	5.08E-02
Cobalt-60	Ci	-------	-------	3.91E-01	1.31E-02
Iron-59	Ci	-------	-------	1.78E-01	2.70E-03
Zinc-65	CI	-------	-------	1.20E-01	3.94E-02
Manganese-54	Ci	-------	-------	3.27E-01	2.54E-02
Chromium-51	Ci	-------	-------	9.52E-01	1.04E-01
Zirconium-niobium-95	Ci	-------	-------	-------	-------
Molybdenum-99	Ci	-------	-------	5.14E-05	1.84E-04
Technetium-99m	Ci	-------	-------	3.32E-05	1.79E-04
Barium-lanthanum-140	Ci	-------	-------	-------	-------
Cerium-141	Ci	-------	-------	-------	-------
Tungsten-187	Ci	-------	-------	1.29E-04	-------
Arsenic-76	Ci	-------	-------	2.82E-04	2.93E-04
Iodine-133	Ci	-------	-------	-------	-------
Hydrogen-3	Ci	-------	-------	1.61E-00	2.03E-00
Iron-55	Ci	-------	-------	-------	-------
Manganese-56	Ci	-------	-------	-------	-------
Neptunium-239	Ci	-------	-------	-------	-------
Nickel-65	Ci	-------	-------	9.41E-04	-------
Praseodymium-144	Ci	-------	-------	-------	-------
Sodium-24	Ci	-------	-------	5.92E-02	5.75E-04
Total for Period (Above)	Ci	-------	-------	4.33E-00	2.27E-00
Xenon-133	Ci	-------	-------	2.35E-04	5.88E-05
Xenon-135	Ci	-------	-------	4.05E-05	3.47E-05

TABLE 3A

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

JANUARY - JUNE

A. Solid Waste Shipped Off-Site for Burial or Disposal (Not irradiated fuel)

1. Type of Waste	UNIT	6-MONTH PERIOD	EST. TOTAL ERROR, %
a.* Spent resins, filter sludge bottoms, etc.	m^3	1.80E+02	5.00E+01
	Ci	2.88E+01	5.00E+01
b. Dry compressible waste, contaminated equip., etc.	m^3	--------	--------
	Ci	--------	--------
c. Irradiated components, control rods, etc.	m^3	--------	--------
	Ci	--------	--------
d. Other (describe)	m^3	--------	--------
	Ci	--------	--------

*All were solidified in cement as Class A waste in strong, tight containers as LSA. One strong, tight container was shipped in a Type A cask due to radiation level.

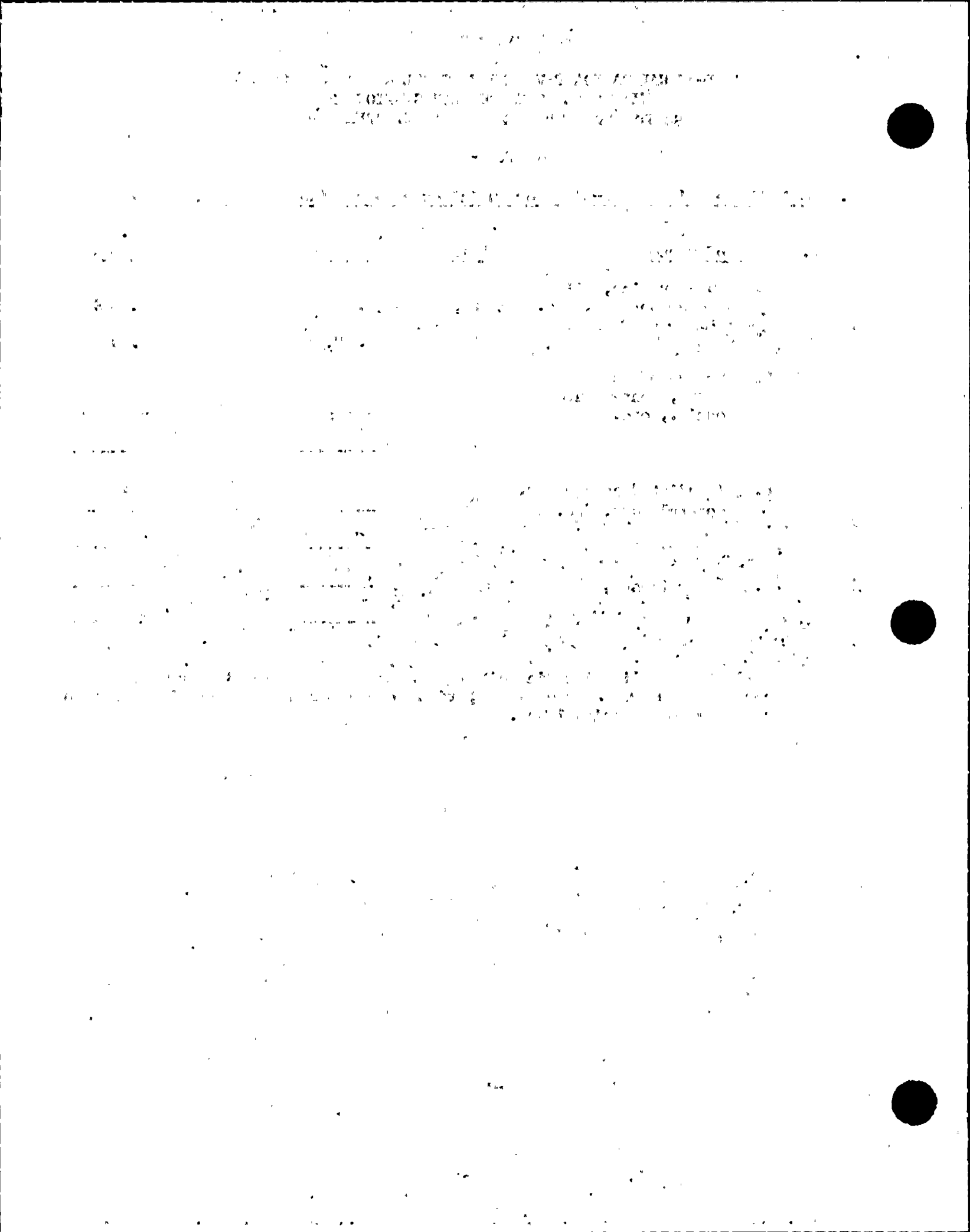

TABLE 3A
(Continued)

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

2. Estimate of Major Nuclide Composition (by Type of Waste)

a. Spent Resins, filter sludges, evaporator bottoms, etc.

	Percent	Est. Total Error, %
Cobalt-60	1.00E+01	5.00E+01
Manganese-54	1.50E+01	5.00E+01
Iron-55	3.10E+01	5.00E+01
Cobalt-58	2.30E+01	5.00E+01
Chromium-51	7.00E+00	5.00E+01
Zinc-65	9.00E+00	5.00E+01
Others	5.00E+00	5.00E+01

b. Dry Compressible Waste, Contaminated Equips, Etc.

c. Irradiated components, control rods, etc.

d. Other (describe)

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
18	Truck	Barnwell S.C.

B. IRRADIATED FUEL SHIPMENTS (DISPOSITION)

Number of Shipment	Mode of Transportation	Destination
None	-	-

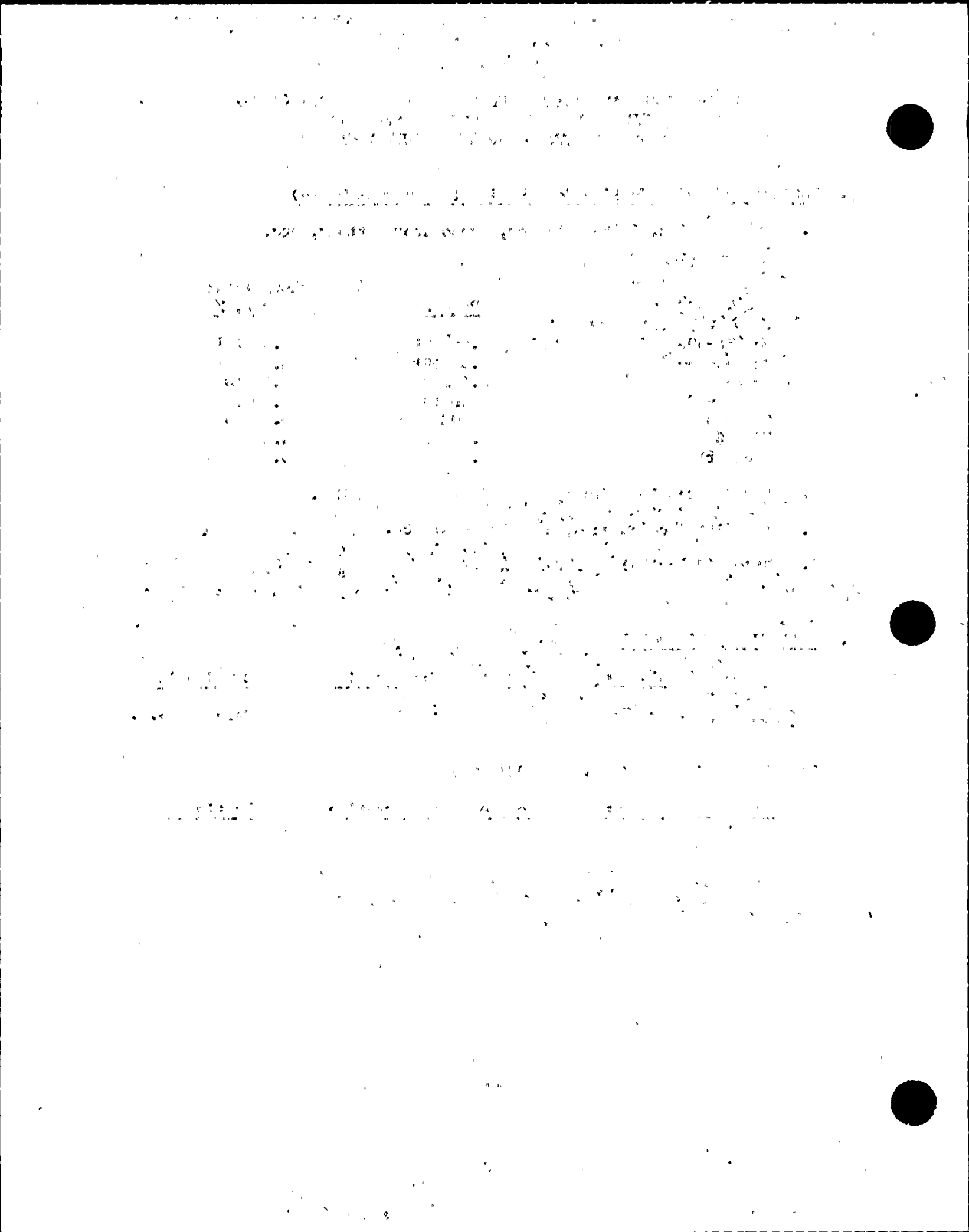

TABLE 4

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION # 2
RECENT CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

Change	Reason
ODCM Figures 2-1 thru 2-8 have been simplified	To comply with a NRC request
ODCM Figures 3-1 thru 3-4 have been simplified	To comply with a NRC request
Section 4.1 changed to calculate dose to either a teenager or an adult based on 67 hours per year	Due to the nature of the receptor and extensive fishing in the area, the critical individual may be either a teenager or an adult
Section 4.4 Revision in calculation of dose to members of the public within the site boundary	Undocumented observations of extensive fishing activity
Table 5.1 changes in environmental monitoring program sample locations	Changes in local dairy farm operations and fishing activity
Section 2.1.3.2 changed to 90 days after Commercial Operation	To allow more time for completion of evaluation

TABLE 5

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
RECENT CHANGES TO PROCESS CONTROL PROGRAM

Change	Reason

There have been no changes to the Process Control Program during this reporting period.

TABLE 6

SEMI-ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (1988)
NINE MILE POINT NUCLEAR STATION #2
EXPLANATION OF INSTRUMENTATION INOPERABILITY

INSTRUMENT	DATE OUT OF SERVICE	DATE RETURNED TO SERVICE	EXPLANATION
Stack Noble Gas, sample flow, system flow and Particulate and Iodine Samplers	9/23/87	--------	Design deficiency with alarm annunciation reflash with Noble Gas Channel. Anticipated completion 9-1-88. Flow and samplers considered inop due to inter-relationship with Noble Gas Channel.
Vent Noble Gas, sample flow, system flow, and Particulate and Iodine Samplers	9/23/87	--------	Design deficiency with alarm annunciation reflash with Noble Gas Channel. Anticipated completion 9-1-88. Flow and samplers considered inop due to inter-relationship with Noble Gas Channel.
Offgas System Flow	8/87	--------	Original monitor has an inappropriate location. Modification awaiting disposition.
Offgas Hydrogen Monitors	8/87	--------	Original monitors loses sample flow when placed in service. Awaiting modification. Expected completion 12/88.
Liquid Radwaste Radiation	11/87	--------	Monitors background is very high. Detection chamber acts as a crud trap. Awaiting modification.

NOTE: The Nine Mile Point Nuclear Station (James A. FitzPatrick Nuclear Power Plant) has improved its processing of wind direction data this reporting period. This was accomplished by the replacement of it's 360 degree wind direction processors with 540 degree wind direction processors. The 540 degree processing of wind direction is state of the art and affords improved readability of north winds on analog wind direction recorders. All other aspects of the system remain the same.