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THREE MILE ISLAND NUCLEAR STATION Control file
UNIT #2 OPERATING PROCEDURE 2105-1.8

RADIATION MONITORING SYSTEM
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Unit 2 Staff Recommends Approval

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Unit 1 PORC Recommends Approval

NA Date —
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PORC comments of — included
(date)

By — Date —

Unit 2 PORC Recommends Approval

Norman Ollerman Date 2-3-77
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PORC comments of — included
(date)

By — Date —

Approval [signature] Date 2-3-77
Unit Superintendent

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THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2105-1.8

RADIATION MONITORING SYSTEM

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RADIATION MONITORING SYSTEM

1.0 REFERENCES

1.1 Drawings Applicable for Operation.

1.1.1 Heating and Ventilation Building Air Intake and Exhaust, B&R Flow Diagram 2219.

1.1.2 Heating, Ventilation and Air Conditioning Control Building, B&R Flow Diagram 2044.

1.1.3 Heating and Ventilation Fuel Handling Building, B&R Flow Diagram 2343.

1.1.4 Heating and Ventilation Auxiliary Building, B&R Flow Diagram 2042.

1.1.5 Reactor Building - Ventilation and Purge, B&R Flow Diagram 2041.

1.1.6 Reactor Coolant Make-Up and Purification, B&R Flow Diagram 2024.

1.1.7 Intermediate Closed Cooling Water, B&R Flow Diagram 2029.

1.1.8 Radwaste Disposal Reactor Coolant Liquid, B&R Flow Diagram 2027.

1.1.9 Decay Heat Closed Cooling Water, B&R Flow Diagram 2035.

1.1.10 Nuclear Services Closed Cooling Water, B&R Flow Diagram 2030.

1.1.11 Spent Fuel Cooling and Decay Heat Removal, B&R Flow Diagram 2026.

1.1.12 Make-up Water Treatment and Condensate Polishing, B&R Flow Diagram 2006.

1.1.13 Radwaste Disposal - Gas, B&R Flow Diagram 2028.

1.1.14 Condenser Air Extraction, B&R Flow Diagram 2010.

1.1.[illegible] Victoreen - System Diagram, B&R File # 65-00-0003.

1.1.16 Victoreen - Cabinet Outline, B&R File # 65-00-0004.

1.1.17 Unit #1 River Water System, GAI C-302-202.

1.2 Operating Procedures Applicable for Operation.

1.2.1 2104-5.12 Air Intake Tunnel H&V.

1.2.2 2104-5.4 Control Building H&V.

1.2.3 2104-5.2 Fuel Handing Building H&V.

1.2.4 2104-5.3 Auxiliary Building H&V.

1.2.5 2104-5.1 Reactor Builidng Normal and Emergency Ventilation and Cooling.

1.2.6 2104-1.2 Make-Up and Purification.

1.2.7 2104-1.6 Intermediate Closed Cooling Water.

1.2.8 2104-4.1 Misc. Liquid Waste Disposal.

1.2.9 2104-4.2 Reactor Coolant - WDL.

1.2.10 2104-3.3 Decay Heat Closed Cooling Water.

1.2.11 2104-3.2 Nuclear Services Closed Cooling Water.

1.2.12 2104-1.5 Spent Fuel Cooling.

1.2.13 2104-2.1 Cycle Make-Up Pretreatment.

1.2.14 2106 2.2 Condensate Polishing.

1.2.15 2105-1.2 Condensor Air Extraction.

1.2.16 2102-4.1 Reactor Building Vent and Purge.

1.3 Manufacturers Instruction Manuals.

1.3.1 Victoreen Instruction Manual (B&R Spec. #65).

1.4 Applicable System Descriptions.

1.4.1 Radiation Monitoring System (Index #52).

1.5 Curves, Tables, Etc.

1.5.1 None.

2.0 LIMITS AND PRECAUTIONS

2.1 Equipment.

2.1.1 When a High Differential Pressure Alarm across the Iodine Charcoal Filter has alarmed, change the filter. Continuous operation with a clogged filter will cause excessive wear on the vacuum pump. The alarm point for the High Differential Pressure is ≈ 7.0 CFM.

2.1.2 When testing the Detector High Radiation Alarm, insure that all interlock switches are in the defeat position to prevent inadvertently tripping the interlocks.

2.2 Administrative.

2.2.1 The radiation monitoring equipment has power supplies which produce high internal and external voltages (up to 2500 volts). Care should be taken when working near this equipment to avoid electrical shock.

3.0 PREREQUISITES

(Initial Each Step Upon Satisfactory Completion).

_____3.1 The local strip chart and Panel 12 multipoint recorders are prepared for operation, see Table 5 for list of recorders and recorder locations.

_____3.2 All log ratemeter function selector switches are in the OFF position.

_____3.3 The Iodine Channel Toggle Switches located between the ratemeter and the analyzer board, must be in the ANALYZER MODE.

_____3.4 The particulate continuous filter NORMAL-OFF-PROGRAM switches on Panel 12 are in the OFF position.

_____3.5 The pump pushbutton switch on Panel 12 indicates STOP.

_____3.6 Power is available from Regulated Voltage Power Supply 2-12R and the following breakers are closed:

Breaker No.	Equipment
22	Panel 12
20	MU-R-720
14	IC-R-1091
16	IC-R-1092
18	WDL-R-1311
19	WT-R-3894
21	WT-R-3895

_____3.7 Power is available to the Radiation Monitoring Panel RMP-EA and the following breakers are closed:

Breaker	Equipment
2	HP-R-219
4	HP-R-221A
12	HP-R-221B
3	HP-R-222
1	HP-R-225
5	HP-R-226
7	HP-R-228
6	HP-R-229

____3.8 Power is available to the Radiation Monitoring Panel RMP-EB and the following breakers are closed:

Breaker	Equipment
2	HP-R-220
4	HP-R-227
6	WDG-R-1480
3	WDG-R-1485
1	WDG-R-1486
5	VA-R-748

____3.9 System valves line-up per Attachment 5.

4.0 PROCEDURE

(Initial Each Step Upon Completion).

4.1 Start-Up.

4.1.1 Area Monitors (G-M Tube).

NOTE: This procedure should be used to start-up any Area Monitor listed on Attachment 1.

____4.1.1.1 ROTATE the FUNCTION switch to OPER position for area monitors except HP-R-214. VERIFY that the green FAIL light COMES ON to indicate power is available.

NOTE 1: Allow the electronics to warm up for 30 minutes.

NOTE 2: It may be necessary to activate the check source momentarily by PRESSING the green button for the meter to begin indicating.

____4.1.1.2 ROTATE the FUNCTION switch to ALL position for HP-R-214. Verify that the green FAIL light COMES ON to indicate power is available. Record observation on Attachment 1.

_____4.1.1.3 Verify proper channel operation, except HP-R-214, by pressing each individual check source pushbutton (same as FAIL light) and observing increased MR/hr reading. RECORD observation on Attachment 1 and RELEASE the pushbutton.

_____4.1.1.4 OPEN the door of HP-UR-1901 and HP-UR-1902 recorders and place the power switch to the ON position, then close door.

_____4.1.1.5 Verify proper channel operation of HP-R-214 by ROTATING the function switch to the C.S. position and observing increased MR/hr reading. RECORD observation on Attachment 1. RETURN the function switch to the ALL position.

_____4.1.1.6 Check the ALERT and HIGH alarm setpoints by pressing the appropriate pushbutton on the readout module and allowing the meter to indicate the point at which the alarm is set. Record proper setpoints and readings from 2105-1.12 on Attachment 1. If adjustments are necessary refer to the appropriate Surveillance or Preventative Maintenance Procedures.

_____4.1.1.7 Verify that each of the recorder readouts corresponds to ± 25% of the meter reading by pushing the check source pushbutton, or rotating the function switch to C.S. position for HP-R-214. The two Gamma radiation recorders HP-UR-1901 and HP-UR-1902 are located on Panel 12. Record data on Attachment 1. If recorder is not within the ± 25% value, notify the instrument department for recorder calibration.

4.1.2 Atmospheric Monitors (FIXED).

NOTE: This procedure should be used to start-up Atmospheric Monitor listed on Attachment 2.

_____4.1.2.1 Turn the keylock NORMAL DEFEAT switches for the following monitors to DEFEAT on Panel 12 to prevent automatic interlock actuation while placing the monitors in service.

NOTE: Interlocks are actuated by particulate and gas channels only.

HP-R-219	HP-R-226
HP-R-220	HP-R-228
HP-R-221A	WDG-R-1480
HP-R-221B	WDG-R-1485
HP-R-222	WDG-R-1486
HP-R-225	

_____4.1.2.2 Apply power to all Particulate, Iodine, and Gas ratemeter circuits by each function selector switch to the OPER position. Verify that the green FAIL light comes on to indicate power is ON and record on Attachment 2.

_____4.1.2.3 OPEN the door of the following recorders and PLACE the power switch to the ON position, then close the door:

HP-UR-3263	Panel 12
HP-UR-1907	Panel 12
HP-UR-2000	Panel 12
HP-R-219	Local
HP-R-227	Local

_____4.1.2.4 OBTAIN the setpoints for each monitor from 2105-1.12 and RECORD in the REQUIRED SETPOINT column of Attachment 2.

_____4.1.2.5 Check the ALERT and HIGH alarm setpoints by pressing the appropriate pushbutton on the readout module and allow the meter to stabilize indicating the setpoint. Verify proper setpoints on Attachment 2. If adjustments are necessary refer to the appropriate Surveillance or Preventative Maintenance Procedure.

_____4.1.2.6 Verify and record proper operation by pressing the C.S. (Check Source) pushbutton on each channel record ratemeter and recorder readings and OBSERVE an increase in count-rate above background on Attachment 2.

_____4.1.2.7 At Panel 12 PRESS the pumping system START pushbutton for the following and locally insure that the flow rate is 8.0 CFM on Attacemnet 3 for the following:

HP-R-219	HP-R-226
HP-R-220	HP-R-227
HP-R-221A	HP-R-228
HP-R-221B	HP-R-229
HP-R-222	WDG-R-1480
HP-R-225	WDG-R-1485
VA-R-748	WDG-R-1486

_____4.1.2.8 At Panel 12 place the particulate continuous filter power switch in the ON position.

_____4.1.2.9 At Panel 12 place the particulate continuous filter switch in the NORMAL position.

HP-R-219	HP-R-225
HP-R-220	HP-R-226
HP-R-221A	HP-R-227
HP-R-221B	HP-R-228
HP-R-222	HP-R-229

_____4.1.2.10 At Panel 12 place the following keylock NORMAL-DEFEAT switches to NORMAL:

HP-R-219	HP-R-226
HP-R-220	HP-R-228
HP-R-221A	HP-R-229
HP-R-221B	WDG-R-1480
HP-R-222	WDG-R-1485
HP-R-225	WDG-R-1486

_____4.1.2.11 Insure that the following flow lights have de-energized:

Particulate Flow Fault

Iodine Flow Fault

Flow Fault

4.1.3 Liquid Monitors.

NOTE 1: MU-R-720 (Primary Coolant Letdown Monitor) consists of two separate ratemeters connected to one detector. Both ratemeters must be energized to place MU-R-720 in service.

NOTE 2: The Water Treatment and Condensate Polishing Monitor WT-R-3894 and WT-R-3895 have local control and indication only.

NOTE 3: This procedure should be used to start-up any monitor listed on Attachment 4.

_____4.1.3.1 TURN the keylock NORMAL-DEFEAT switches for the following monitors to DEFEAT, on Panel 12, to prevent automatic interlock actuation while placing the monitors in service.

WDL-R-1311

_____4.1.3.2 Apply power to all liquid channels by placing each ratemeter function selector switch to the OPER position. Verify that the GREEN FAIL light comes on to indicate power is ON and record on Attachment 4.

NOTE: For WT-R-3894 and 3895 this must be done locally.

_____4.1.3.3 OPEN the door of the following recorders and PLACE the power supply switch to the ON position then close the door:

RECORDER		LOCATION
HP-UR-3264	-	Panel 12
WT-UR-3894	-	Local
WT-UR-3895	-	Local

_____4.1.3.4 OBTAIN the setpoints for each monitor from 2105-1.12 and RECORD in the REQUIRED SETPOINT column of Attachment 4.

_____4.1.3.5 Verify and record proper operation by pressing the C.S. (Cheak Source) pushbutton on each channel RECORD ratemeter and recorder reading on Attachment 4 and OBSERVE an increase in COUNT-RATE above background on Attachment 4.

_____4.1.3.6 Check the ALERT and HIGH alarm setpoints by pressing the appropriate pushbutton on the readout module and allow the meter to stablize indicating the point setpoint. Verify proper setpoints on Attachment 4. If adjustments are necessary refer to the appropriate Surveillance or Preventative Maintenance Procedure.

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_____4.1.3.7 At Panel 12 insure the following flow status lights are indicative of the system status.

MU-R-720	IC-R-1093	DC-R-3400
IC-R-1091	DC-R-3399	SF-R-3402

_____4.1.3.8 Verify that the recorder is aligned properly by the ratemeter and recorder readings of 4.1.3.5 being with ± 25% for each monitor.

4.2 Normal Operation

During normal operation the monitors will continuously monitor the area it is in or the process its monitoring for abnormal radiation levels.

4.3 Shutdown

4.3.1 Area Gamma Monitors

_____4.3.1.1 ROTATE the function switch to the OFF position for the applicable monitors. Verify that the GREEN FAIL light goes OFF to indicate power has been removed.

_____4.3.1.2 If HP-UR-1901 and/or HP-UR-1902 "Area Monitor Recorder" are to be turned off, place the applicable power switch to the OFF position.

4.3.2 Atmospheric Monitors.

_____4.3.2.1 At Panel 12 place the particulate continuous filter power switch for the applicable monitor(s) in the OFF position.

_____4.3.2.2 At Panel 12 ROTATE the function selector switch to the OFF position. Verify that the GREEN FAIL light goes OFF.

_____4.3.2.3 At Panel 12 STOP the monitor pumping system by pushing the applicable STOP pushbutton.

NOTE: If maintenance is to be performed on the monitor it will be necessary to valve out per AP-1002.

4.3.3 Liquid Monitors.

_____4.3.3.1 At Panel 12 place the function selector switch for the applicable monitor(s) in the OFF position.

_____4.3.3.2 If HP-UR-3264 LIQUID MONITOR RECORDER is to be turned off, place the applicable power switch to the OFF position.

TABLE 1

RADIATION MONITORING SYSTEM DETECTOR LOCATIONS

I AREA GAMMA MONITORS

1. HP-R-201 Control Room.
2. HP-R-202 Cable Room.
3. HP-R-204 Reactor Bldg. Emerg. Cooling Booster Pump Area.
4. HP-R-205 Reactor Coolant Evaporator Control Panel Area.
5. HP-R-206 Make-Up Tank Area.
6. HP-R-207 Intermediate Cooling Pump Area.
7. HP-R-209 Fuel Handling Bridge - North (R.B. Main Bridge).
8. HP-R-210 Fuel Handling Bridge - South (R.B. Aux. Bridge).
9. HP-R-211 Personnel Access Hatch.
10. HP-R-212 Equipment Hatch.
11. HP-R-213 In-Core Instrument Panel Area.
12. HP-R-214 Reactor Building Dome.
13. HP-R-215 Fuel Handling Bridge (in Fuel Handling Building).
14. HP-R-218 Waste Disposal Storage Area.
15. HP-R-231 Aux. Bldg. Sump Tank Filter Room.
16. HP-R-232 Access Corridor Column AT/A61 - Radwaste Panel Area.
17. HP-R-233 Access Corridor Column AN/A63 - Spent Fuel Filter Area.
18. HP-R-234 Access Corridor Column CE/C50A - Contaminated Drain Tank Area.
19. HP-R-3236 Reactor Bldg. Purge Unit Area.
20. HP-R-3238 Aux. Bldg. Exchange Unit Area.
21. HP-R-3240 Fuel Handling Exhaust Unit Area.

TABLE 1 (cont'd)

II Liquid Monitors

1. MU-R-720-HI Primary Coolant Letdown - Gross.
2. MU-R-720-LOW Primary Coolant Letdown - Iodine.
3. IC-R-1091 Intermediate Cooling Water Letdown - MU-C-1B.
4. IC-R-1092 Intermediate Cooling Water Letdown - MU-C-1A.
5. IC-R-1093 Intermediate Cooling Water Cooler Outlet
6. WDL-R-1311 Liquid Effluent - Plant #2.
7. DC-R-3399 Decay Heat Closed Cooling Water - Loop A.
8. DC-R-3400 Decay Heat Closed Cooling Water - Loop B.
9. NS-R-3401 Nuclear Services Closed Cooling Water.
10. SF-R-3402 Spent Fuel Cooling.
11. WT-R-3894 Water Treatment and Condensate Polishing.
12. WT-R-3895 Water Treatment and Condensate Polishing.

III ATMOSPHERIC MONITORS

1. HP-R-219 (PIG) Station Vent Monitor.
2. HP-R-220 (PIG) Control Room Intake Duct.
3. HP-R-221A (PIG) Fuel Handling Bldg. Exh. Duct - Upstream.
4. HP-R-221B (PIG) Fuel Handling Bldg. Exh. Duct - Downstream.
5. HP-R-222 (PIG) Aux. Bldg. Purge Air Exhaust Upstream.
6. HP-R-223 (PIG) Moveable Monitor - Spent Fuel Area.
7. HP-R-224 (PIG) Moveable Monitor - Aux. Building.
8. HP-R-225 (PIG) R.B. Purge Air Exhaust Duct A.
9. HP-R-226 (PIG) R.B. Purge Air Exhaust Duct B.
10. HP-R-227 (PIG) Reactor Air Sample Line.

TABLE 1 (cont'd)

11. HP-R-228 (PIG) Aux. Bldg. Purge Air Exhaust - Downstream.

12. HP-R-229 (PIG) Hydrogen Purge Duct.

13. WDG-R-1480 (G) Waste Gas Discharge.

14. WDG-R-1485 (G) Decay Gas Tank 1A Discharge.

15. WDG-R-1486 (G) Decay Gas Tank 1B Discharge.

16. VA-R-748 (G) Condenser Vacuum Pump Exhaust.

TABLE 2

UNIT #2 AREA MONITORS

MONITOR NUMBER	MONITOR NAME	MONITOR LOCATION	LOCAL ⓪ READOUT	RADIATION DETECTED	TYPE OF DETECTED	TYPE OF CHECK SOURCE
HP-R-201	Control Room	Control Bldg. El. 305'-0" (On Column c48/cA)	None	GAMMA	G-M	
HP-R-202	Cable Room	Control Bldg. El. 305'-0" (On Column c47a/cC)	M,IL,H	GAMMA	G-M	
HP-R-204	R.B. Emergency Cooling Booster Pump Area	Auxiliary Bldg. El. 280'-6" (On Column AB/AG1)	M,IL,H	GAMMA	G-M	
HP-R-205	R.C. Evaporative Control Panel Area	Auxiliary Bldg. El. 280'-6" (On Column AG/AG3)	M,IL,H	GAMMA	G-M	
HP-R-206	Make-Up Tank Area	Auxiliary Bldg. El. 305'-0" (Entrance to MU-T-1)	M,IL,H	GAMMA	G-M	
HP-R-207	Intermed. Cooling Pump Area	Auxiliary Bldg. El. 305'-0" (South of IC-P-1B)	M,IL,H	GAMMA	G-M	
HP-R-209	Fuel Handling Bridge North	Reactor Bldg. El. 347'-6" (Main Fuel Handling Bridge)	M,IL	GAMMA	G-M	
HP-R-210	Fuel Handling Bridge South	Reactor Bldg. El. 347'-6" (Aux. Fuel Handling Bridge)	M,IL	GAMMA	G-M	
HP-R-211	Personnel Access Hatch	Reactor Bldg. El. 305'-0" (On Elevator Wall)	M,IL,H	GAMMA	G-M	
HP-R-212	Equipment Hatch	Reactor Bldg. El. 305'-0" (On Column R4)	M,IL,H	GAMMA	G-M	
HP-R-213	Incore Inst. Panel Area	Reactor Bldg. El. 347'-6" (North Side of A D-Ring)	M,IL,H	GAMMA	G-M	
HP-R-214	Reactor Building Dome	Reactor Bldg. El.	None	GAMMA	Ion-Chamber	

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TABLE 2 (cont'd)

MONITOR NUMBER	MONITOR NAME	MONITOR LOCATION	LOCAL ⊙ READOUT	RADIATION DETECTED	TYPE OF DETECTED	TYPE OF CHECK SOURCE
HP-R-215	Fuel Handling Building	Fuel Handling Bldg El 347'-6" (On Fuel Handling Bridge)	M,IL,H	GAMMA	G-M	
HP-R-218	Waste Disposal Storage Area		M,IL,H	GAMMA	G-M	
HP-R-231	Aux. Bldg. Sump Tank Filter Room	Auxiliary Bldg. El. 280'-6" (On Column AQ/A62b)	M,IL,H	GAMMA	G-M	
HP-R-232	Aux. Bldg. Access Corridor Col AT/A61 El. 305'-0"	Auxiliary Bldg. El. 305'-0" (South-side of Column AR/A61	M,IL,H	GAMMA	G-M	
HP-R-233	Aux. Bldg. Access Corridor Col AN/A63 El. 305'-0"	Auxiliary Bldg. El. 305'-0" (By Column AN/A63)	M,IL,H	GAMMA	G-M	
HP-R-234	Control & Serv. Bldg. Corridor Col CE/c50a El. 280'-6"	Service Bldg. El. 280'-6" (On Column c50a/CE)	M,IL,H	GAMMA	G-M	
HP-R-3236	Reactor Bldg. Purge Unit Area	Auxiliary Bldg. El. 328'-0" (On Column AE/A64)	M,IL,H	GAMMA	G-M	
HP-R-3238	Aux. Bldg. Exhaust Unit Area	Auxiliary Bldg. El. 328'-0" (On Column AJ/A63)	M,IL,H	GAMMA	G-M	
HP-R-3240	Fuel Handling Bldg. Exhaust Unit Area	Auxiliary Bldg. El. 328'-0" (On Column AL/A63)	M,IL,H	GAMMA	G-M	

⊙ M - METER
IL - INDICATING LIGHT
H - HORN

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TABLE 3

UNIT #2 ATMOSPHERIC MONITORS

MONITOR NUMBER	MONITOR NAME	MONITOR LOCATION	REMOTE INDICATION	TYPE OF DETECTOR	TYPE OF CHECK SOURCE
HP-R-219 P I G	Station Vent	Aux. Bldg. El. 328'-0" (Near Column AB/A65)	Monitor Monitor Monitor	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-220 P I G	Control Room Intake Duct	Control Bldg. El.351'-6" (Near Colum T35/cD)	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-221A P I G	Fuel Handling Building Exhaust Duct Upstream of Filter	Aux. Bldg. El. 328'-0" (North Wall (Column AT/A63))	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-221B P I G	Fuel Handling Building Exhaust Duct Downstream of Filter	Aux. Bldg. El. 328'-0" (North Wall (Column AT/A63))	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-222 P I G	Auxiliary Building Purge Air Exhaust Upstream of Filter	Aux Bldg. El. 328'-0" (North Wall (Column AT/A63))	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-225 P I G	R.B. Purge Air Exhaust Duct A	Aux. Bldg. El. 328'-0" (West of Column ABa/A64)	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-226 P I G	R.B. Purge Air Exhaust Duct B	Aux. Bldg. El. 328'-0" (West of Column ABa/A64)	N_O N_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-227 P I G	Reactor Air Sample Line	Aux. Bldg. El. 305'-0" (Near Column ABa/A64)	Monitor Monitor Monitor	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs

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TABLE 3 (cont'd)

UNIT #2 ATMOSPHERIC MONITORS

MONITOR NUMBER	MONITOR NAME	MONITOR LOCATION	REMOTE INDICATION	TYPE OF DETECTOR	TYPE OF CHECK SOURCE
HP-R-228 P I G	Auxiliary Building Purge Air Exhaust Downstream of Filter	Aux. Bldg. El. 328'-0" (North Wall (Column AT/A62b))	H_O H_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-229 P I G	Hydrogen Purge Duct	Aux. Bldg. El. 328'-0" (West Wall (Column AE/A65))	H_O H_E	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
VA-R-748 G	Condenser Vacuum Pump Exhaust	Turbine Bldg El. 281'-6" East of Col TG/T42	NONE	Beta Scintillation	^{137}Cs
WDG-R-1480G	Waste Gas Discharge	Aux. Bldg. El. 328'-0" (West of Col AB/A62a)	Panel 302B	Beta Scintillation	^{137}Cs
WDG-R-1485G	Decay Gas Tank 1A Discharge	Aux. Bldg. El. 305'-0" (WDG-T-1A Valve Room)	Panel 302B	Beta Scintillation	^{137}Cs
WDG-R-1486G	Decay Gas Tank 1B Discharge	Aux. Bldg. El. 305'-0" (WDG-T-1B Valve Room)	Panel 302B	Beta Scintillation	^{137}Cs
HP-R-223 P I G	Moveable Monitor Spent Fuel Area	Fuel Handling Bldg. El. 347'-6" (East Wall (Column AH/A65))	Monitor Monitor Monitor	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs
HP-R-224 P I G	Moveable Monitor Auxiliary Building	Aux. Bldg. El. 280'-6" (West Wall (Column AQ/A65))	Monitor Monitor Monitor	Beta Scintillation Gamma Scintillation Beta Scintillation	^{137}Cs ^{133}Ba ^{137}Cs

KEY FOR TABLE UNIT #2 ATMOSPHERIC MONITORS

P - PARTICULATE MONITOR
I - IODINE MONITOR
G - GASEOUS MONITOR

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TABLE 4

UNIT #2 LIQUID MONITORS

MONITOR NUMBER	MONITOR NAME	MONITOR LOCATION	REMOTE INDICATION	TYPE OF DETECTOR	TYPE OF CHECK SOURCE
MU-R-720 Hi MU-R-720 Low	Primary Coolant Letdown Hi Primary Coolant Letdown Low	Aux. Bldg. El. 305'-0" (Outside North Wall of MU-K-1A (Makeup Demin))	NONE NONE	Gamma Scintillation	^{133}Ba
IC-R-1091	Intermediate Cooling Water Letdown Cooler MU-C-1B	Reactor Bldg El. 282'-6" Outside of R.B. Sump Rm.	NONE	Gamma Scintillation	^{133}Ba
IC-R-1092	Intermediate Cooling Water Letdown Cooler MU-C-1A	Reactor Bldg El. 282'-6" Outside of R.B. Sump Rm.	NONE	Gamma Scintillation	^{133}Ba
IC-R-1093	Intermediate Cooling Water Cooler Outlet	Aux. Bldg. El. 305'-0" (east of Column AB/A63)	NONE	Gamma Scintillation	^{133}Ba
WDL-R-1311	Liquid Effluent Plant No. 2	Aux. Bldg. El. 280'-6" (North of Column AN/A63)	Panel 301	Gamma Scintillation	^{133}Ba
DC-R-3399	Decay Heat Closed Cooling Water Loop A	Fuel Handling Bldg. El. 280'-6" (By Column AK/A67)	NONE	Gamma Scintillation	^{133}Ba
DC-R-3400	Decay Heat Closed Cooling Water Loop B	Fuel Handling Bldg. El. 280'-6" (By Column AK/A67)	NONE	Gamma Scintillation	^{133}Ba
NS-R-3401	Nuclear Services Closed Cooling Water	Aux. Bldg. El. 305'-0" (North of NS-T-2)	NONE	Gamma Scintillation	^{133}Ba
SF-R-3402	Spent Fuel Cooling	Aux. Bldg. El. 305'-0" (West of SF-P-1A)	NONE	Gamma Scintillation	^{133}Ba
WT-R-3894	Water Treatment and Condensate Polishing	Turbine Bldg El. 281'-6" (South Side of Regeneration Station Along East Wall)	LOCAL ONLY	Gamma Scintillation	^{133}Ba
WT-R-3895	Water Treatment and Condensate Polishing	Same as WT-R-3894	LOCAL ONLY	Gamma Scintillation	^{133}Ba

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TABLE 5

RECORDERS

RECORDER NUMBER	RECORDER DESCRIPTION	RECORDER LOCATION
HP-UR-1901	Area Monitoring	Panel 12
HP-UR-1902	Area Monitoring	Panel 12
HP-UR-1907	Atmospheric Monitoring	Panel 12
HP-UR-2900	Atmospheric Monitoring	Panel 12
HP-UR-3263	Atmospheric Monitoring	Panel 12
HP-UR-3264	Liquid Monitoring	Panel 12
HP-UR-7587	Spent Fuel Area Monitor HP-R-223	HP-R-223
HP-UR-7588	Aux. Building Area Monitor HP-R-224	HP-R-224
	Stack Flow Recorder	HP-R-219

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ATTACHMENT 1

AREA MONITOR CHECK LIST

PROCEDURE STEP	4.1.1.2 4.1.1.3	4.1.1.6	4.1.1.6	4.1.1.6	4.1.1.6	4.1.1.3	4.1.1.3	4.1.1.7
MONITOR	GREEN FAIL LIGHT ON	REQUIRED HIGH ALARM SETPOINT	OBSERVED HIGH ALARM SETPOINT	REQUIRED ALERT ALARM SETPOINT	OBSERVED ALERT ALARM SETPOINT	CHECK SOURCE INCREASE YES/NO	CHECK SOURCE RATEMETER READING	CHECK SOURCE RECORDER READING
HP-R-201								
HP-R-202								
HP-R-204								
HP-R-205								
HP-R-206								
HP-R-207								
HP-R-209								
HP-R-210								
HP-R-211								
HP-R-212								
HP-R-213								
HP-R-214								
HP-R-215								
HP-R-218								
HP-R-231								
HP-R-232								
HP-R-233								
HP-R-234								
HP-R-3236								
HP-R-3238								
HP-R-3240								

Performed by_____ Date_____

Approved by_____ Date_____

ATTACHMENT 2

ATMOSPHERIC MONITOR CHECK LIST								
PROCEDURE STEP	4.1.2.2	4.1.2.4	4.1.2.5	4.1.2.4	4.1.2.5	4.1.2.6	4.1.2.6	4.1.2.6
MONITOR	GREEN FAIL LIGHT ON	REQUIRED HIGH ALARM SETPOINT	OBSERVED HIGH ALARM SETPOINT	REQUIRED ALERT ALARM SETPOINT	OBSERVED ALERT ALARM SETPOINT	CHECK SOURCE INCREASE YES/NO	CHECK SOURCE RATEMETER READING	CHECK SOURCE RECORDER READING
HP-R-219 P								
HP-R-219 I								
HP-R-219 G								
HP-R-220 P								
HP-R-220 I								
HP-R-220 G								
HP-R-221A P								
HP-R-221A I								
HP-R-221A G								
HP-R-221B P								
HP-R-221B I								
HP-R-221B G								
HP-R-222 P								
HP-R-222 I								
HP-R-222 G								
HP-R-223 P								
HP-R-223 I								
HP-R-223 G								
HP-R-224 P								
HP-R-224 I								
HP-R-224 G								

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ATTACHMENT 2 (cont'd)

ATMOSPHERIC MONITOR CHECK LIST

PROCEDURE STEP	4.1.2.2	4.1.2.4	4.1.2.5	4.1.2.4	4.1.2.5	4.1.2.6	4.1.2.6	4.1.2.6
MONITOR	GREEN FAIL LIGHT ON	REQUIRED HIGH ALARM SETPOINT	OBSERVED HIGH ALARM SETPOINT	REQUIRED ALERT ALARM SETPOINT	OBSERVED ALERT ALARM SETPOINT	CHECK SOURCE INCREASE YES/NO	CHECK SOURCE RATEMETER READING	CHECK SOURCE RECORDER READING
HP-R-225 P								
HP-R-225 I								
HP-R-225 G								
HP-R-226 P								
HP-R-226 I								
HP-R-226 G								
HP-R-227 P								
HP-R-227 I								
HP-R-227 G								
HP-R-228 P								
HP-R-228 I								
HP-R-228 G								
HP-R-229 P								
HP-R-229 I								
HP-R-229 G								
WDG-R-1480								
WDG-R-1485								
WDG-R-1486								
VA-R-748								

Performed by_____ Date_____

Approved by_____ Date_____

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ATTACHMENT 3

PUMPING SYSTEM CHECK OFF SHEET

MONITOR NUMBER	PUMP ON (INITIAL)	ACTUAL FLOW	NORMAL STATUS CPM or CFM	MONITOR NUMBER	PUMP ON (INITIAL)	ACTUAL FLOW	NORMAL STATUS CPM or CFM
MU-R-720				HP-R-223			
IC-R-1091				HP-R-224			
IC-R-1092				HP-R-225			
WDL-R-1311				HP-R-226			
WT-R-3894				HP-R-227			
WT-R-3895				HP-R-228			
HP-R-219				HP-R-229			
HP-R-220				WDG-R-1480			
HP-R-221A				WDG-R-1485			
HP-R-221B				WDG-R-1486			
HP-R-222				VA-R-748			

Performed by:_____ Date_____

Approved by:_____ Date_____

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ATTACHMENT 4

LIQUID MONITOR CHECK LIST								
PROCEDURE STEP	4.1.3.2	4.1.3.4	4.1.3.6	4.1.3.4	4.1.3.6	4.1.3.5	4.1.3.5	4.1.3.5
MONITOR	GREEN FAIL LIGHT ON	REQUIRED HIGH ALARM SETPOINT	OBSERVED HIGH ALARM SETPOINT	REQUIRED ALERT ALARM SETPOINT	OBSERVED ALERT ALARM SETPOINT	CHECK SOURCE INCREASE YES/NO	CHECK SOURCE RATEMETER READING	CHECK SOURCE RECORDER READING
MU-R-720 Hi								
MU-R-720 Lo								
IC-R-1091								
IC-R-1092								
IC-R-1093								
WDL-R-1311								
DC-R-3399								
DC-R-3400								
NS-R-3401								
SF-R-3402								
WT-R-3894								
WT-R-3895								

Performed by_____ Date_____

Approved by_____ Date_____

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ATTACHMENT 5

Valve list to be supplied later.

TMI DOCUMENTS

DOCUMENT NO: TM-0164

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METROPOLITAN EDISON COMPANY.

Wilda R. Mullinix, NRC

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