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WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-ENV-8 REV. A TITLE: Total Population Dose Estimate Calculations DATE 7-26-83 PAGE 1 of 6
REVIEWED BY M L Marchi/T P Meiss	APPROVED BY C R Lunna

1.0 APPLICABILITY

This procedure is implemented by the Environmental Protection Director (EPD) after a release of radioactive effluents during an emergency to calculate the total population dose.

2.0 PRECAUTIONS

2.1 Accurate recording of data is essential.

2.2 Double check all calculations.

3.0 REFERENCES

3.1 EP-ENV-3 series of procedures.

4.0 INSTRUCTIONS

4.1 Utilize the EP-ENV-3 series of procedures and field samples to determine the sectors affected by plume track.

4.2 Dispatch Environmental Monitoring teams to the appropriate sample locations (Table ENV-8.1) of the plume-affected sectors to exchange environmental TLDs.

NOTE: The TLDs removed must have a label attached indicating their Location Number.

4.3 Direct that the Environmental TLDs be taken to the Site Radiation Emergency Team for transfer to the plant for readings. Ensure the Location Number is recorded with the TLD Serial Number during reading.

4.4 Obtain the Environmental TLD location and Serial Numbers and readings from the RPO/RAF.

4.5 Calculate the total Whole Body and Iodine Sector Doses by completing Form ENV-8.1 for each affected sector and Form ENV-8.2 for total population dose.

TABLE ENV-8.1

TLD MONITORING AND SAMPLING LOCATIONS

1. Lakeshore Rd (M) 1/4 mile north of Zander Rd.
6. County BBB 1/2 mile south of BB
10. County B 1/4 mile north of Zander Rd.
16. Access Rd. off of Tappawingo Rd. 1/4 mile east of Tannery Rd.
17. Tappawingo Rd. 3/4 mile west of Tannery Rd.
23. Lakeshore Rd. (M) 1/4 mile north of Nuclear Rd. (M)
46. Nuclear Rd. (K) 0.4 mile east of State Hwy 42
47. Nuclear Rd. (K) 1/2 mile west of Hwy 42
48. County Hwy BB and State Hwy 42 intersection
49. German Lane 1/4 mile west of State Hwy. 42
53. State Hwy 42 and intersection of Nuclear Rd. (K)
56. State Hwy 42 and intersection of Sandy Bay Rd.
57. Sandy Bay Rd. and intersection of Cemetary Rd.
58. Cemetary Rd. and intersection of Sandy Bay Rd.
59. Lakeshore Rd. (K) and intersection of Cemetary Rd.
60. Lakeshore Rd. (K) 1/2 mile east of State Hwy 42
61. Lakeshore Rd. (K) and State Hwy 42 intersection
63. Sandy Bay Rd. 1/2 mile west of State Hwy 42
65. Woodside Rd. 1/2 mile north of Nuclear Rd. (K)
69. Town Hall Rd. 1/4 mile north of County Hwy BB
70. Town Hall Rd. 1/4 mile north of Nuclear Rd. (K)
74. Woodside Rd. and County Road G intersection
85. County Hwy B 1/4 mile north of County Hwy G

TABLE ENV-8.1 (cont'd)

TLD MONITORING AND SAMPLING LOCATIONS

89. Nuclear Rd. (K) 1/2 mile east of Range Line Rd.

| 105. County Hwy B 1/4 mile south of County Hwy J

109. Town Line Rd. and State Hwy 42 intersection

111. Lake Rd. 1/2 mile east of State Hwy 42

| 129. East end of Krok Rd, along the lakeshore

133. Lakeshore Rd. 1/2 mile north of Kewaunee city

135. County Hwy F 1-1/4 miles west of State Hwy 42

136. Maple Lane 1/2 mile west of County Hwy C

| 138. Sleepy Hollow Rd. 1/4 mile north of Hwy 29

140. Schweiner Rd. 1/2 mile south of County Hwy J

141. Schultz Rd. and State Hwy 96

143. County Hwy Q 1/4 mile north of State Hwy 147

144. Fisherville Rd. and Cherney Rd. intersection

| 145. Steiners Corners Rd. 1/2 mile west of State Hwy. 147

| 147. Point Beach Rd. 1/2 mile south of County Hwy. VV

(K) = Kewaunee County

(M) = Manitowoc County

TABLE ENV-8.2

POPULATION AND TLD DISTRIBUTION BY SECTOR

SECTOR	ENV. TLD LOCATION #'s				POPULATION/SEGMENT		
	(a)	(b)	(c)	(d)	0-2 mi (e)	2-5 mi (f)	5-10 mi (g)
J	N/A	1	23	147	0	17	439
K	48	6	16	145	10	186	970
L	49	6	17	144	20	99	1735
M	47	69	10	143	17	194	462
N	46	70	89	141	7	82	436
P	58	65	85	140	10	112	567
Q	63	74	105	138	14	133	660
R	56	61	109	136	10	119	610
A	57	60	111	135	10	126	2618
B	58	59	129	133	7	91	616

FORM ENV-8.1

SECTOR POPULATION DOSE WORKSHEET

SECTOR _____

DOWNWIND SEGMENT	ENV. TLD LOCATION #'s	ENV. TLD SERIAL #'s	TLD DOSE READINGS(REM)	AVERAGE W.B. DOSE/SEGMENT (REM)
0-2 mi	_____(a)	_____	_____	
			+ _____	/ 2 = _____
2-5 mi	_____(b)	_____	_____	
			+ _____	/ 2 = _____
5-10 mi	_____(c)	_____	_____	
			+ _____	/ 2 = _____
	_____(d)	_____	_____	

	AVERAGE W.B. DOSE/SEGMENT (REM)		POPULATION/ SEGMENT		TOTAL DOSE/ SEGMENT (MAN-REM)
0-2 mi	_____	x	_____	(e)	= _____
2-5 mi	_____	x	_____	(f)	= _____
5-10 mi	_____	x	_____	(g)	= _____

TOTAL SECTOR W.B. DOSE = _____ MAN-REM

	ESTIMATED IODINE DOSE/ SEGMENT (REM)		POPULATION/ SEGMENT		TOTAL IODINE DOSE/ SEGMENT (MAN-REM)
0-2 mi	_____	x	_____	(e)	= _____
2-5 mi	_____	x	_____	(f)	= _____
5-10 mi	_____	x	_____	(g)	= _____

TOTAL SECTOR IODINE DOSE = _____ MAN-REM

FORM ENV-8.2

TOTAL POPULATION EXPOSURE CALCULATION

	TOTAL SECTOR W.B.DOSE(MAN-REM)	TOTAL SECTOR IODINE DOSE (MAN-REM)
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____
SECTOR _____	_____	_____

TOTAL POPULATION W.B. DOSE _____

TOTAL POPULATION IODINE DOSE _____

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTATION PROCEDURE	NO. EP-RET-3C REV. A TITLE: Post Accident Operation of the High Radiation Sample Room DATE: JUL 26 1983 PAGE 1 of 24
REVIEWED BY W.W. Winnowski M. L. Marchi	APPROVED BY R.E. Lange

1.0 PURPOSE

1.1 This procedure is to detail the requirements, considerations, and operation of the High Radiation Sample Room during a post LOCA condition.

2.0 APPLICABILITY

2.1 This is to detail the procedures to be utilized for obtaining:

a. Diluted liquid sample of primary coolant, for Boron Analysis and Isotopic Analysis (Sect 5.1).

b. An inline sample for pH, conductivity, oxygen, and chloride analysis (Sect 5.2).

c. An inline sample of primary coolant for Hydrogen Analysis, and a dilute sample of gases, contained in Primary Coolant, for Isotopic Analysis (Sect 5.3).

d. An undiluted sample of Primary Coolant for off-site analysis (Sect 5.4).

e. Containment Hydrogen Analyzer measurement (Sect 5.5).

f. Containment Air Sample Panel operation (Sect 5.6).

3.0 PRECAUTIONS

3.1 Process an Emergency Radiation Work Permit (see EP-AD-11).

3.2 Contact Health Physics Dept for:

a. Proper personnel dosimetry.
b. Proper radiation detection instrumentation.
c. Personnel for continuous HP coverage during sampling.
d. Remote area monitor readings in area of HRSR.

3.3 Utilize onsite communications with the Radiological Protection Director, as necessary, during sampling.

4.0 REFERENCES

4.1 Sentry HRSS Operating and Maintenance Manual

4.2 RC-C-82, Boron Analysis - Curcumin Method

4.3 RC-C-201, HRSR Conductivity, YSI/Rexnord Dissolved Oxygen, and pH Analysis

4.4 RC-C-202, Hydrogen-Gas Chromatography Analysis

4.7 RC-C-203, Chloride-Ion Chromatography (IC) Analysis

5.0 PROCEDURE

5.1 Dilute Liquid Grab Sample

5.1.1 Proceed to HRSR per HP/RPD recommendations.

5.1.2 At the C.A.S.P. Control Panel check ventilation on in "normal" position and High Vacuum Lights indicate "normal" for the LSP and CAP.

5.1.3 Check radiation levels in HRSR, and in maintenance area behind panels, if access is required.

5.1.4 Check the following Lab Equipment available and operational:

a. Drying oven on at 55°C to 60°C.
b. Fume hood ventilation normal.
c. Shielded aliquoter available.
d. DI water flush hoses connected to LSP and supply valve on.
e. New 24 ml diluted sample bottle.
f. Hand operated vacuum pump.
g. Lights on in Diluted Sample Port of LSP.
h. LSP Sample Cask available with diluted sample bottle piston installed.
i. Perform valve lineup per Attachment #1.
j. Reach Rod for remote valve operation.
k. All material required in section 4 of RC-C-82.
l. Multi-channel analyzer available for counting.
m. 2 - 1 liter poly bottles.

5.1.5 Evacuate the diluted sample bottle to 15 inches of vacuum or greater. Install in sample cask and check cask for proper operation.

5.1.6 Install the sample cart under the diluted sample port and position the bottle up on the needles.

5.1.7 Check level in dilution water reservoirs. Fill to full mark as necessary.

5.1.8 Have Control Room Operator open RC-422 and RC-423 for RCHL sample.

5.1.9 At the Sample Acquisition Panel:

a. For RCHL Sample: Open CC-314
Open RC-423-1

b. For RHR Sample: Open CC-316
Open RHR-81-A (81-B)

c. For all Samples: Turn RC-437-1 (437-2) to DDT

5.1.10 At the Liquid Sample Panel: Open V-3
Open V-1.2 (V-1.1 for RHR)

5.1.11 Regulate Reactor Coolant (RHR) flow using RC-VREL-1 until flow indicator RC-FI-1 indicates between 35 to 40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A D/P of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.1.12 Upon completion of the purge: Shut V-3
Open V-8.2
Open V-8.1
Open V-2

5.1.13 Regulate Reactor Coolant (or RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 3 minutes.

NOTE: A D/P of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min flow rate.

5.1.14 Upon completion of the purge: Turn DV-1 to "Sample"
Shut V-1.2 (V-1.1 for RHR)

5.1.15 Throttle open V-21 and add 24 ml of DI water, from the graduated reservoir to the sample bottle, then close RC-V-21.

5.1.16 Turn DV-1 to "Bypass".

5.1.17 Open V-4. Observe Flush Water Flow Rate of 18-22 inches of water for a minimum of 3 minutes.

5.1.18 Upon completion of flush: Shut V-4
Shut V-2
Shut V-8.2
Shut V-8.1

5.1.19 Have Control Room Operator shut RC-422 and RC-423 (not required for RHR).

5.1.20 At the Sample Acquisition Panel:

For RCHL Sample: Open FPC-51
Open FPC-51-14

For RHR Sample: Shut RHR-81-A (81-B)
Open FPC-51

5.1.21 At the Liquid Sample Panel: Open V-1.2 (V-1.1 for RHR)
Open V-3

Observe Flush Water Flow Rate of 35 to 40 inches of water as indicated on RC-FI-1. Maintain flush for 5 minutes while performing step 5.1.22.

NOTE: A D/P of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.1.22 Lower the diluted sample bottle into the sample cask. Close the cask and install auxiliary shield. Place cask near fume hood.

5.1.23 Upon completion of flushing: Shut V-1.2 (V-1.1 for RHR)
Shut V-3

5.1.24 At the Sample Acquisition Panel:

For RCHL Sample: Shut RC-423-1
Shut FPC-51-14
Shut FPC-51
Shut CC-314

For RHR Sample: Shut RHR-81-A (81-B)
Shut FPC-51-41
Shut FPC-51
Shut CC-316

For all samples: Turn RC-437-1 (or 437-2) to VCT

5.1.25 Using the shielded liquid aliquoter, transfer a 1.0 ml sample from the sample cask into a VYCOR evaporating dish.

NOTE: For Boron analysis of less than 2000 ppm, use an appropriately larger amount of sample.

5.1.26 Continue the Boron analysis with step 6.2 of RC-C-82.

5.1.27 For Beta Gamma analysis, transfer 1.0 ml of coolant from the cask to a liter poly bottle using the shielded liquid aliquoter. Dilute to 1 liter.

5.1.28 From the diluted 1 liter bottle in step 5.1.27, transfer 10 ml to another empty liter bottle. Dilute to 1 liter. This sample may be transferred to the multi-channel analyzer for counting.

NOTE: Total dilution is (x 10^8)

5.2 Inline Sample for pH, Cond, O_2 and Cl

5.2.1 Proceed to HRSR per HP/RPD recommendations.

5.2.2 Verify ventilation is ON in "normal" position and high vacuum lights indicate "normal" for the LSP and CAP.

5.2.3 Check radiation levels in HRSR, and in maintenance area behind panels, if access is necessary.

5.2.4 Verify the following lab equipment available and operational.

a. DI water flush hoses connected to LSP and CAP with supply valves open.
b. Verify valve lineup for SAP, LSP, and CAP, per Attachment #1.
c. Reach Rod for Remote Valve operation.
d. Main Power switch at CMP "on".
e. At the CMP, turn on the YSI chart recorder, pH meter, conductivity meter, and start IC unit for base line.
f. Check HRSS calibration log for verification of latest performances.
g. Check gas bottles (argon and air) for adequate supply.

5.2.5 At the CAP: Turn V-6 to Liquid Sample
Turn V-5 to Liquid Sample

5.2.6 Have the Control Room Operator open RC-422 and RC-423 (not required for RHR sample).

5.2.7 At the Sample Acquisition Panel:

For RCHL Sample: Open CC-314
Open RC-423-1

For RHR Sample: Open CC-316
RHR 81-A (81-B)

For all samples: Turn RC-437-1 (or 437-2) to DDT.

5.2.8 At the Liquid Sample Panel: Open V-3
Open V-1.2 (V-1.1 for RHR)

5.2.9 Regulate Reactor Coolant (or RHR) flow using RC-VREL-1 until flow indicator RC-FI-1 indicates between 35-40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A D/P of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.2.10 Upon completion of the purge: Shut V-3
Open V-2
Open V-7
Turn V-22 to Chem Panel

5.2.11 Regulate Reactor Coolant (or RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A D/P of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min flow rate.

5.2.12 Verify adequate flow rate to the CAP by observing the lights "on" for both O_2 flow and IC flow.

5.2.13 When the YSI O_2 meter chart reading has stabilized:

Record the conductivity reading
Record the temperature
Record the O_2 reading
Place the Load/Inject switch on the IC unit to "Inject"

5.2.14 At the Liquid Sample Panel: Turn V-22 to Waste
Shut V-1.2 (V-1.1 for RHR)
Open V-4

5.2.15 Observe DI Water Flush to Waste as indicated on Flow Indicator RC-FI-2. After 2 minutes:
Record pH reading
Place the Load/Inject switch on the IC unit to "Load"

5.2.16 Flush the CAP by turning V-22 to Chem Panel position. Verify flush water flow by observing the lights "on" for both O_2 Flow and IC Flow. Continue flush for 2 minutes.

NOTE: Chloride results should read out 5 to 10 minutes after injection (step 5.2.13).

5.2.17 Upon completion of flush to CAP:

At the LSP: Turn V-22 to Waste
Shut V-7
Shut V-2
Shut V-4

At the CAP: Turn V-6 to O_2 Cal
Turn V-5 to Closed

5.2.18 Have Control Room Operator shut RC-422 and RC-423 (not required for RHR sample).

5.2.19 At the Sample Acquisition Panel:

For RCHL Sample: Open FPC-51
Open FPC-51-14

For RHR Sample: Shut RHR 81-A (81-B)
Open FPC-51
Open FPC-51-41

5.2.20 At the Liquid Sample Panel:

Open V-1.2 (V-1.1 for RHR)
Open V-3
Use V-REL-1 to control flush water flow rate of 35 to 40 inches of water as indicated on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

NOTE: A D/P of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min flow rate.

5.2.21 Upon completion of flushing: Shut V-1.2 (V-1.1 for RHR)
Shut V-3

5.2.22 At the Sample Acquisition Panel:

For RCHL Sample: Shut RC-423-1
Shut FPC-51-14
Shut FPC-51
Shut CC-314

For RHR Sample: Shut RHR 81-A (81-B)
Shut FPC-51-41
Shut FPC-51
Shut CC-316

For all samples: Turn RC-437-1 (or 437-2) to VCT

5.3 Hydrogen and Gaseous Activity Grab Sample

5.3.1 Proceed to HRSR per HP/RPD recommendations.

5.3.2 Verify ventilation on in "normal" position and high vacuum lights indicate "normal" for the CAP and LSP.

5.3.3 Check radiation levels in HRSR, and in maintenance area behind panels, if access is necessary.

5.3.4 Verify the following lab equipment available and operational:

a. DI water flush hoses connected to LSP and CAP with supply valves open.
b. Verify valve lineup for SAP, LSP, and CAP per Attachment #1.
c. Reach Rod for remote valve operation.
d. Main power switch at the CMP "on".
e. Check the program in GC mini-computer and latest data in the HRSS Cal Log.
f. Check Argon and Air Pressure in lab and at the bottles for adequate supply.
g. 10 cc gas sample bottle, with septum, properly installed in face of LSP, using the special handling tool.
h. Verify multi-channel analyzer available for counting.

5.3.5 Dry the expansion vessel: Turn V-11 to "Argon"
Open V-9
Open V-8.2
Open V-10

5.3.6 Adjust RC-VREL-2 as necessary to obtain 20 psi on RC-G-3 for 1 minute. Observe flow indication on RC-FI-2 also.

5.3.7 Upon completion of Drying Expansion Vessel:

Turn V-11 to 9 o'clock position
Shut V-9
Shut V-8.2

5.3.8 Have Control Room Operator open RC-422 and RC-423 (not required for sample from RHR).

5.3.9 At the Sample Acquisition Panel:

For RCHL Sample: Open CC-314
Open RC-423-1

For RHR Sample: Open CC-316
Open RHR 81-A (81-B)

For all samples: Turn RC-437-1 (or 437-2) to DDT

5.3.10 At the Liquid Sample Panel: Open V-3
Open V-1.2 (V-1.1 for RHR)

5.3.11 Regulate Reactor Coolant (RHR) flow using RC-VREL-1 until flow indicator RC-FI-1 indicates between 35 to 40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A D/P of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.3.12 Evacuate the Gas Expansion Vessel, sample bottle and tubing:

Open V-13
Open V-15
Turn DV-2 to 6 o'clock position
Open V-12

5.3.13 When vacuum on RC-G-2.2 reads 22 inches vacuum or greater, turn DV-2 to 3 o'clock position.

5.3.14 When vacuum on RC-G-2.1 reads 22 inches of vacuum or greater:

Shut V-15
Shut V-13

Shut V-10
Turn V-11 to Closed
Shut V-12

NOTE: Observe vacuum reading on both gauges holding steady.

5.3.15 Open V-14 and observe about 1.0 psi on RC-G-2.2.

5.3.16 Upon completion of purge (from step 5.3.11):

Shut V-3
Open V-8.2
Open V-8.1
Open V-2

5.3.17 Regulate Reactor Coolant (RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 3 minutes.

NOTE: A D/P of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min flow rate.

5.3.18 Upon completion of sample purge:

Shut V-8.2
Shut V-8.1
Shut V-1.2 (V-1.1 for RHR)
Open V-9
Open V-16 (for 1 full minute)

5.3.19 Upon completion of gas stripping, commence LSP flush:

Shut V-16
Shut V-9
Open V-8.2
Open V-8.1
Open V-4
Turn V-11 to 9 o'clock position

5.3.20 Obtain the diluted gas sample by turning DV-2 to 6 o'clock position.

5.3.21 Observe pressure gauge RC-G-2.2 stabilized at about 1 psi:

Turn DV-2 to 3 o'clock position
Shut V-14

5.3.22 Remove the diluted gas sample bottle from the LSP and place entire assembly in fume hood for later transport to multi-channel analyzer.

5.3.23 At the CMP, operate the GC mini-computer to draw a vacuum on all 4 sample loops.

5.3.24 At the LSP open V-15 and allow the gas sample to transfer to the GC.

5.3.25 Operate the GC unit to obtain 4 samples for hydrogen determination. By selective attenuation, starting with a high value, determine the hydrogen concentration.

5.3.26 Have Control Room Operator shut RC-422 and RC-423 (not required for RHR sample).

5.3.27 At the Sample Acquisition Panel:

For RCHL Sample: Open FPC-51
Open FPC-51-14

For RHR Sample: Shut RHR 81-A (81-B)
Open FPC-51
Open FPC-51-41

5.3.28 At the Liquid Sample Panel: Shut V-4
Shut V-2
Shut V-8.1
Shut V-8.2
Open V-3
Open V-1.2 (V-1.1 for RHR)

Using V-REL-1, regulate flush water flow rate of 35 to 40 inches of water on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

5.3.29 At the completion of flushing: Shut V-1.2 (V-1.1 for RHR)
Shut V-3

5.3.30 At the Sample Acquisition Panel:

For RCHL Samples: Shut RC-423-1
Shut FPC-51-14
Shut FPC-51
Shut CC-314

For RHR Sample: Shut RHR 81-A (81-B)
Shut FPC-51-41
Shut FPC-51
Shut CC-316

For all samples: Turn RC-437-1 (or 437-2) to VCT.

5.3.31 At the LSP flush the expansion vessel:

Open V-8.2
Open V-9
Turn V-11 to "DI Water" position

Allow system to flush for 2 minutes.

5.3.32 Upon completion of flush: Turn V-11 to "Argon" position and blow expansion vessel dry

5.3.33 Upon completion of drying expansion vessel:

Turn V-11 to Close
Shut V-9
Shut V-8.2

5.3.34 Remove radioactive gases from gas system:

Open V-10
Open V-13
Open V-15
Turn V-11 to 9 o'clock position
Open V-12

Evacuate system for 1 full minute.

5.3.35 Upon evacuation of gas system:

Shut V-12
Turn V-11 to "closed" position
Shut V-15
Shut V-13
Shut V-10

5.3.36 Transport diluted gas bottle to multi-channel analyzer for analysis, per RC-C-(63).

5.4 Undiluted Liquid Grab Sample

5.4.1 Proceed to HRSR per HP/RPD recommendations.

5.4.2 Check ventilation on, in "normal" position and high vacuum lights indicate "normal" for the LSP and CAP.

5.4.3 Check radiation levels in HRSR, and in maintenance area behind panels, if access is necessary.

5.4.4 Check the following lab equipment available and operational:

a. DI water flush hoses connected to LSP and supply valve open.
b. Check valve lineup per Attachment #1.
c. Reach rod for remote valve operation.
d. New undiluted liquid sample bottle available.
e. New undiluted liquid flush bottle, with special tool, available.
f. Sample cask available with undiluted sample piston installed.
g. Light on in undiluted sample port of LSP.

5.4.5 Install undiluted sample bottle in cask and check for proper operation.

5.4.6 Install the sample cask under the undiluted sample port and position the bottle up on the needles.

5.4.7 Have Control Room Operator open RC-422 and RC-423 (not required for RHR sample).

5.4.8 At the Sample Acquisition Panel:

For RCHL Sample: Open CC 314
Open RC 423-1

For RHR Sample: Open CC 316
Open RHR 81-A (81-B)

For all samples: Turn RC-437-1 (or 437-2) to DDT.

5.4.9 At the Liquid Sample Panel: Open V-3
Open V-1.2 (V-1.1 for RHR)

5.4.10 Regulate Reactor Coolant (RHR) flow using RC-VREL-1 until flow indicator RC-FI-1 indicates between 35-40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A D/P of 35-40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.4.11 Upon completion of the purge: Shut V-3
Open V-2
Open V-7

5.4.12 Regulate Reactor Coolant (RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 3 minutes.

NOTE: A D/P of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min.

5.4.13 Upon completion of the purge: Turn V-19 to "sample".

Observe flow into/thru sample bottle to waste. Purge time required only to insure bottle is full.

5.4.14 Upon completion of sample fill: Turn V-19 to "bypass"
Shut V-1.2 (V-1.1 for RHR)
Open V-4

5.4.15 While system is in DI water flush, return undiluted sample to cask, close lead top, and remove cask from lab. Install auxiliary shield.

NOTE: DI water flush should be performed for a minimum of 3 minutes before going to step 5.4.16.

5.4.16 Place undiluted sample flush bottle, and special flush tool into position.
Turn V-19 to "sample"
Allow system to flush for an additional 3 minutes.

5.4.17 Upon completion of sample flush: Turn V-19 to "bypass"
Shut V-7
Shut V-2

5.4.18 Have Control Room shut RC-422 and RC-423 (not required for RHR sample).

5.4.19 At the Sample Acquisition Panel:

For RCHL Sample: Open FPC-51
Open FPC-51-14

For RHR Sample: Shut RHR 81-A (81-B)
Open FPC-51
Open FPC-51-41

5.4.20 At the Sample Acquisition Panel: Open V-1.2 (V-1.1 for RHR)
Open V-3

Using V-REL-1, regulate flush water flow rate of 35 to 40 inches of water, as indicated on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

NOTE: A D/P of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.4.21 Upon completion of flushing: Shut V-1.2 (V-1.1 for RHR)
Shut V-3

5.4.22 At the Sample Acquisition Panel:

For RCHL Sample: Shut RC-423-1
Shut FPC-51-14
Shut FPC-51
Shut CC-314

For RHR Sample: Shut FPC-51-41
Shut FPC-51
Shut CC-316

For All Samples: Turn RC 437-1 (437-2) to VCT.

5.5 Containment Hydrogen Monitor 1A & 1B Operation Procedure

5.5.1 Proceed to HRSR per HP/RPD recommendations.

5.5.2 Check ventilation on in "normal" position.

5.5.3 Check radiation levels in HRSR and maintenance area behind panels, if access is necessary.

5.5.4 Check to make sure remote panels are in stand-by and have had 6 hours warmup time.

5.5.5 Insure heat tracing is energized and operational.

5.5 6 Check monitor selection at Sample Acquisition Panel to insure it is not sampling same loop as the CASP.

5.6.7 Call Control Room and verify Dome Fans 1A and 1B are operational.

5.6.8 Have Control Room Operator open 1 set of the following valves:

Loop A	Loop B
LOCA-2A	LOCA-2B
LOCA-10A	LOCA-10B
LOCA-3A	LOCA-3B

5.6.9 Insure that when selecting sample loop A or B that either hydrogen monitor is not operating or loop selected is opposite that being used by H_2 monitor. Open AS110A or AS110B.

5.6.10 Connect local pressure transmitter to cart selected for sampling.

NOTE: Do not use the I.S.C. cart for this procedure

5.6.11 CASP two minute pre-sample back flush:

SV-10 Open
SV-6 Open
SV-5 Open

Insure flow monitor on CASP is indicating flow.

5.6.12 Three minute sample capture:

SV-5 Closed
AV-2 Open

For Sample Station 1 - AV-1 and SV-1.2 Open
For Sample Station 2 - SV-2.1 and SV-2.2 Open
For Sample Station 3 - SV-3.1 and SV-3.2 Open
For Sample Station 4 - SV-4.1 and SV-4.2 Open

Open manual inlet and outlet values and close manual bypass valve on sample cart selected. Check pressure transmitter for indication of negative pressure. Insure CASP Flow Meter is still indicating flow.

5.6.13 Fifteen second flask equilibration:

SV-6 Closed

Flow Monitor on CASP should go out. Pressure Transmitter should reach stability (NOTE: Equal to containment pressure).

5.6.14 Three Minute Residual Sample Gas Removal: Close Manual inlet and outlet valves, open bypass valve and close corresponding solenoid valves for station selected in step 5.6.12. Flow Monitor on CASP should still be out. After 3 minutes open SV-6.

5.6.15 Initial fifteen second post sample back-flush: AV-2 Closed

Flow Monitor should indicate flow.

5.6.16 Second fifteen second post sample back-flush: SV-5 Open

Flow Monitor should indicate flow.

5.6.17 Three minute sample flask line flush: SV-5 Closed

Open corresponding solenoid valves for sample station selected in step 5.6.12 and flush for three minutes. Flow indicator should indicate flow.

5.6.18 After flush is completed, close the following valves in order solenoid valves for station selected in step 5.6.12:

SV-10 Closed
SV-6 Closed

5.6.19 Call Control Room and have containment isolation valves selected in step 5.6.8 closed.

CAUTION: Make sure correct set is closed to avoid damaging hydrogen monitors.

5.6.20 After cart is removed, reset "Active/Inactive" indicator lights to Inactive mode.

Attachment 1 (cont'd)

Liquid Sample Panel

V-17	Open Grab Sample	SHUT
V-6.1	Rem Smpl Bomb Inlet	SHUT
V-6.2	Rem Smpl Bomb Outlet	SHUT
V-5.1	Rem Smpl Bomb Inlet Iso	SHUT
V-5.2	Rem Smpl Bomb Outlet Iso	SHUT
V-REL-1	RC Purge Throttle	THROTTLED
V-3	RC Purge Stop	SHUT
V-REL-2	RC Purge to Waste Tk	THROTTLED
V-7	Smpl Bomb Bypass	SHUT
V-2	RC Purge to Waste Stop	SHUT
V-1.1	RHR Smpl Iso	SHUT
V-1.2	RCHL/Pzr Smpl Iso	SHUT
V-1.3	(Spare)	SHUT
V-1.4	(Spare)	SHUT
V-1.5	VCT Gas Sp Smpl Iso	SHUT
V-4	DI Water Flush Iso	SHUT
V-8.1	Press Smpl Bomb Inlet	SHUT
V-8.2	Press Smpl Bomb Outlet	SHUT
V-9	Expansion Vessel Inlet	SHUT
V-16	Argon Gas Strip Purge	SHUT
V-18	RC Backflush	6 o'clock
V-19	Undiluted Liq Smpl	BYPASS
V-22	RC Purge Waste/CAP	WASTE

Attachment 1 (cont'd)

Liquid Sample Panel (cont'd)

/	DV-1	Diluted Liquid Sample	BYPASS
/	V-11	Expansion Vessel Outlet	SHUT
/ |	DV-2	Diluted Gas Smpl	9 o'clock
	V-10	Expansion Vessel Vacuum	SHUT
	V-13	Dil Gas Smpl Vac	SHUT
	V-14	Argon Purge to Dil Gas Smpl	SHUT
	V-15	Gas Smpl to GC	SHUT
	V-12	Argon to Eductor	SHUT

Liquid Sample Panel (Demin Sect)

|	DMV-1.1	CVCS Demin Inlet Iso	SHUT
|	DMV-1.2	CVCS Demin Outlet Iso	SHUT
|	DMV-1.3	(Spare)	SHUT
|	DMV-3	DI Water Flush	SHUT
|	DMV-2.1	CVCS Demin Inlet Smpl	SHUT
|	DMV-2.2	CVCS Demin Outlet Smpl	SHUT
|	DMV-2.3	(Spare)	SHUT

Attachment 1 (cont'd)

CASP Control Panel

AV-1/SV-1.2	Smpl Pos #1	Inlet/Outlet	CLOSE
SV-2.1/SV-2.2	Smpl Pos #2	Inlet/Outlet	CLOSE
SV-3.1/SV-3.2	Smpl Pos #3	Inlet/Outlet	CLOSE
SV-4.1/SV-4.2	Smpl Pos #4	Inlet/Outlet	CLOSE
SV-5	Smpl Bypass		CLOSE
SV-10	Nitrogen to Eductor		CLOSE
AV-2	Return to Containment		CLOSE
SV-6	Eductor Suction Iso		CLOSE

(At Sample Acquisition Panel)

	AS110A	Cont Air Smpl A Iso	CLOSE
	AS110B	Cont Air Smpl B Iso	CLOSE

Attachment 1 (cont'd)

Chemical Analytical Panel

V-2	IC Smpl Outlet	OPEN
V-5	IC Loop Select	SHUT
V-6	O_2 Loop Select	O_2 - Cal
V-7	O_2 Analyzer Select	YSI
V-8	O_2 Loop Outlet	OPEN
V-9	O_2 Anal Cal Supply	SHUT
V-10	Inst Air Supply	OPEN
V-11	DI Water Supply	OPEN
V-12	Nitrogen Supply	OPEN
V-14	Argon Supply to GC	OPEN
V-15	Cal-3 Supply	OPEN
V-17	O_2 Cal Tk Recirc	SHUT
V-18	O_2 Cal Tk Drain	SHUT
V-19	Cal-3 Drain	SHUT
V-20	pH Cal Tk 2 Drain	SHUT
V-13	IC Inject Port	SHUT
V-16	pH Cal Tk 2 Supply	SHUT
V-25	pH Cal Tk 1 Drain	SHUT
V-27	pH Cal Tk 1 N_2 Supply	VENT
V-28	pH Cal Tk 2 N_2 Supply	VENT
V-29	Cal-3 N_2 Supply	VENT
V-30	pH Cal Tk Select	CAL-1
V-26	pH Cal Tk 1 Supply	SHUT
V-24	O_2 Cal Tk Fill	SHUT

I.M.C.C. CONTROL PANEL

HS-3	Dilution Water Bite Valve	OFF
HS-4	Air/Water Flush Valve	OFF
HS-5	Pressurized Reactor Cool to I.M.C.C.	OFF
HS-6	Reactor Cool. Bite Valve	OFF
HS-7	Mixing Chamber Flush/Vent Valve	OFF
HS-8	Undil. RX. Cool. Smpl. Outlet Valve	OFF
HS-9	Undil. RX. Cool. Smpl/Divert Valve	OFF
HS-10	Mixing Chamber Outlet Valve	OFF
HS-11	Dil. RX. Cool. Smpl. Outlet Valve	OFF
HS-12	Depressurized RX. Cool. to I.M.C.C.	OFF
HS-13	Degassifier Outlet/Flush Valve	OFF
HS-14	Dil. Wtr. Outlet Valve	OFF
HS-15	Air Flush to Mixing Chamber	OFF
HS-16	Gas Marinelli Bypass Valve	OFF
Main Power Switch		ON

WISCONSIN PUBLIC SERVICE CORPORATION

Kewaunee Nuclear Power Plant

EMERGENCY PLAN IMPLEMENTING PROCEDURE

NO. EP-RET-3E

TITLE: Post Accident Operation of High Rad Sample Room Inline Multiport Count Cave

DATE: JUL 26 1983

REVIEWED BY W. Wisniewski
M. L. Marchi

APPROVED BY P. W. Lange

1.0 PURPOSE

This procedure is to detail the requirements, considerations and operation of the Inline Multiported Count cave (I.M.C.C.) during a post LOCA condition.

2.0 APPLICABILITY

This is to detail the procedures to be utilized for obtaining:

a. Inline Diluted Reactor Coolant (Sec 5.1)

b. Inline Undiluted Reactor Coolant (Sec 5.2)

c. Inline Hydrogen and Gaseous Activity (Batch) (Sec 5.3.)

3.0 PRECAUTIONS

3.1 Process an Emergency Radiation Work Permit (See EP-AD-11)

3.2 Contact Health Physics Department for:

a. Proper personnel dosimetery

b. Proper radiation detection instrumentation

c. Personnel for continous HP coverage during sampling

d. Remote area monitor readings in area of H.R.S.R.

3.3 Utilize onsite communication with the Radiological Protection Director, as necessary, during sampling.

4.0 REFERENCES

None

5.0 PROCEDURE

5.1 Inline Diluted Reactor Coolant

5.1.1 Proceed to H.R.S.R. per HP/RPD recommendations.

5.1.2 At the C.A.S.P. control panel, check ventilation on in "NORMAL" position and high vacuum lights indicate "NORMAL" for the L.S.P. and C.A.P.

5.1.3 Check radiation levels in H.R.S.R. and in maintenance area behind panels, if access is required.

5.1.4 Remove the shielding plug from the Diluted Reactor Coolant port of the I.M.C.C.

5.1.5 Remove the portable E.G.G. Ortec detector from the Dewar and place properly in the Diluted Reactor Coolant port of the I.M.C.C.

5.1.6 Request the RPD to have the detector operationally checked from the R.A.F. using the ND 6700.

NOTE: The detector must be functioning properly prior to continuing with the next steps of this procedure.

5.1.7 Check valve lineup per Attachment 1.

5.1.8 For RCHL sample have control room operator OPEN RC-422 and RC-423.

5.1.9 At the Sample Acquistion Panel:

a. For RCHL Sample: OPEN CC 314
OPEN RC 423-1

b. For RHR Sample: OPEN CC 316
OPEN RHR 81-A (81-B)

c. For All Samples: Turn RC-437-1 (437-2) to D.D.T.

5.1.10 At the Liquid Sample Panel: OPEN V-3
OPEN V-1.2 for RCHL (V-1.1 for RHR)

Regulate Reactor Coolant (RHR) flow using RC-V-REL-1 until flow indicator RC-FI-1 indicates 35 to 40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE 1: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

NOTE 2: Continue with Step 5.1.11 during this purge.

5.1.11 At the I.M.C.C. control panel, place

HS-6 ON
HS-15 ON

purge for a minimum of 2 minutes.

5.1.12 At the I.M.C.C. control panel, place

HS-15 OFF
HS-7 ON
HS-10 ON
HS-11 ON

purge for a minimum of 2 minutes.

5.1.13 At the I.M.C.C. control panel, place

HS-7 OFF
HS-10 OFF
HS-11 OFF
HS-14 ON

5.1.14 Upon completion of the 5 minute flush from step 5.1.10, at the LSP:

SHUT V-3
OPEN V-8.2
OPEN V-8.1
OPEN V-2

5.1.15 Regulate Reactor Coolant (RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 2 minutes.

NOTE: A d/p of 18 to 22 inches of water on RC-FI-2 represents approximately 200 cc/min. flow rate.

5.1.16 Upon completion of purge:

SHUT V-8.2

5.1.17 At the I.M.C.C. control panel, place

HS-5 ON
HS-8 ON
HS-3 ON
HS-15 ON

continue this purge for 1 minute.

5.1.18 At the I.M.C.C. control panel, place

HS-3 OFF
HS-15 OFF

wait for 1 minute.

5.1.19 At the I.M.C.C. control panel, place

HS-6 OFF
HS-3 ON
HS-15 ON
HS-8 OFF
HS-5 OFF

wait for 3 minutes.

NOTE: Continue with step 5.1.20 while waiting for sample dilution mixing.

5.1.20 At the L.S.P. commence D.I. water flush:

OPEN V-8.2
SHUT V-1.2 (V-1.1 for RHR)
OPEN V-4
THROTTLE RC-VREL-2 as necessary.

NOTE: Maintain this flush for a minimum of 5 minutes while continuing on with step 5.1.21.

5.1.21 After completing the 3 minute wait from step 5.3.19, continue.

At the I.M.C.C. control panel place

HS-15 OFF
HS-3 OFF
HS-10 ON
HS-7 ON

the diluted primary sample is now in the sample chamber. Request the RPD to have the ND 6700 operated as per RC-C-10 to count the sample.

5.1.22 After completing the 5 minute wait from step 5.1.20. Have control room operator shut RC-422 and RC-423 (not required for RHR sample).

5.1.23 At the Sample Acquistion Panel

For RCHL Sample:

OPEN	FPC-51
OPEN	FPC-51-14

For RHR Sample:

SHUT	RHR 81-A (81-B)
OPEN	FPC-51
OPEN	FPC-51-41

5.1.24 At the Liquid Sample Panel:

SHUT	V-4
SHUT	V-2
SHUT	8.1
SHUT	8.2
OPEN	V-3
OPEN	V-1.2 (V-1.1 for RHR)

Using V-REL-1, regulate SFP flush water flow rate of 35 to 40 inches of water on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

NOTE 1: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.1.25 At the completion of flushing:

SHUT	V-1.2 (V-1.1 for RHR)
SHUT	V-3

5.1.26 At the Sample Acquistion Panel:

For RCHL Samples:

SHUT	RC-423-1
SHUT	FPC-51-14
SHUT	FPC-51
SHUT	CC-314

For RHR Ssmple:

SHUT	RHR 81-A (81-B)
SHUT	FPC-51-41
SHUT	FPC-51
SHUT	CC-316

For All Samples:

Turn RC-437-1 (or 437-2) to VCT position.

5.1.27 Verify with the RPD that all counting of the sample is completed.

5.1.28 At the LSP:

OPEN	V-4
OPEN	V-2
OPEN	V-8.1

At the I.M.C.C. control panel, place:

HS-11	ON
HS-4	ON
HS-6	ON
HS-8	ON
HS-5	ON

continue this flush for 5 minutes.

5.1.29 At the I.M.C.C. control panel, place:

HS-4	OFF
HS-7	OFF
HS-15	ON
HS-3	ON
HS-5	OFF
HS-8	OFF

continue this flush for 1 minute.

5.1.30 At the I.M.C.C. control panel, place

HS-3	OFF
HS-15	OFF
HS-7	ON

continue this flush for 1 minute.

5.1.31 At the I.M.C.C. control panel, place

HS-7	OFF
HS-10	OFF
HS-11	OFF
HS-14	OFF

5.1.32 At the LSP:

SHUT	V-4
SHUT	V-2
SHUT	V-8.1

5.2 Inline Undiluted Reactor Coolant

5.2.1 Proceed to the H.R.S.R. per HP/RPD recommendations.

5.2.2 Verify ventilation is in "NORMAL" position and high vacuum lights indicate "NORMAL" for the C.A.P. and L.S.P.

5.2.3 Check radiation levels in H.R.S.R. and in maintenance area behind panels, if access is necessary.

5.2.4 Verify the following lab equipment available and operational:

a. D.I. water flush hoses connected to L.S.P. with supply valve open.

b. Verify valve lineup per Attachment 1.

c. Check air pressure in lab.

d. Verify ND 6700 analyzer available for counting.

5.2.5 Remove the shielding plug from the undiluted reactor coolant port of the I.M.C.C.

5.2.6 Remove the portable E.G.G. Ortec detector from the Dewar and place properly in the undiluted reactor coolant port of the I.M.C.C.

5.2.7 Request the RPD to have the detector operationally checked from the R.A.F. using the ND 6700.

NOTE: The detector must be functioning properly prior to continuing with this procedure.

5.2.8 For RCHL sample have control room operator open RC-422 and RC-423.

5.2.9 At the Sample Acquistion Panel:

a. For RCHL sample: OPEN CC-314
OPEN RC-423-1

b. For RHR sample: OPEN CC-316
OPEN RHR-81-A (81-B)

c. For All Samples: TURN RC-437-1 (437-2) to D.D.T.

5.2.10 At the Liquid Sample Panel: OPEN V-3
OPEN V-1.2 for RCHL (V-1.1 for RHR)

Regulate Reactor Coolant (RHR) flow rate using RC-VREL-1, until flow indicator RC-FI-1 indicates 35 to 40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE 1: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.2.11 Upon the completion of the 5 minute flush, at the L.S.P.:
SHUT V-3
OPEN V-8.2
OPEN V-8.1
OPEN V-2

Regulate Reactor Coolant flow (RHR) using RC-VREL-2, until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 2 minutes.

NOTE: A d/p of 18 to 22 inches of water on RC-FI-2 represents approximately 200 cc/min. flow rate.

5.2.12 Upon the completion of the 2 minute purge, at the I.M.C.C. control panel place:
HS-5 ON
HS-9 ON
HS-8 ON

5.2.13 At the L.S.P. SHUT V-8.2.

NOTE: Inform the RPD that reactor coolant flow is established. Continue flow until informed by RPD that the system is to be shutdown - then continue with step 5.2.14.

5.2.14 Upon completion of analyzer at the L.S.P.:
SHUT V-1.2 (V-1.1 to RHR)
OPEN V-4

Allow a 3 minute flushing of the undiluted reactor coolant sample port.

5.2.15 Upon completion of the 3 minute flush at the I.M.C.C. control panel place:
HS-5 OFF
HS-9 OFF
HS-8 OFF

At the LSP open V-8.2 and throttle RC-VREL-2 as necessary to maintain a 18-22 inches of water flow rate on RC-FI-2. Maintain this flow rate for 5 minutes.

NOTE: A d/p of 18 to 22 inches of water on RC-FI-2 represents approximately 200 cc/min. flow rate.

5.2.16 After the 5 minute flush, have the control room operator shut RC-422 and RC-423 (not required for RHR sample)

5.2.17 At the Sample Acquistion Panel:

For RCHL Sample:
OPEN FPC-51
OPEN FPC-51-14

For RHR Sample:
SHUT RHR 81-A (81-B)
OPEN FPC-51
OPEN FPC-51-41

5.2.18 At the Liquid Sample Panel:

SHUT V-4
SHUT V-2
SHUT V-8.1
OPEN V-3
OPEN V-1.2 (V-1.1 for RHR)

Using RC-VREL-1, regulate SFP flush water flow rate of 35 to 40 inches of water on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

NOTE 1: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.2.19 At the completion of flushing:

SHUT V-1.2
SHUT V-3

5.2.20 At the Sample Acquistion Panel:

For RCHL Samples:
SHUT RC-423-1
SHUT FPC-51-14
SHUT FPC-51
SHUT CC-314

For RHR Samples:
SHUT RHR-81-A (81-B)
SHUT FPC-51-41
SHUT FPC-51
SHUT CC-316

For All Samples: TURN RC-437-1 (or 437-2) to the VCT position.

5.3 Inline Hydrogen Gaseous Activity (Batch)

5.3.1 Proceed to HRSR per HP/RPD recommendations.

5.3.2 Verify ventilation on in "normal" position and high vacuum lights indicate "normal" for the CAP and LSP.

5.3.3 Check radiation levels in HRSR, and in maintenance area behind panels, if access is necessary.

5.3.4 Verify the following lab equipment available and operational:

a. DI water flush hoses connected to LSP and CAP with supply valves open.
b. Verify valve lineup for SAP, LSP, and CAP per Attachment #1.
c. Reach Rod for remote valve operation.
d. Main power switch at the CMP "on".
e. Check the program in GC mini-computer and latest data in the HRSS Cal Log.
f. Check Argon and Air Pressure in lab and at the bottles for adequate supply.
g. Verify ND-6700 analyzer available for counting.

5.3.5 Remove the shielding plug from the gaseous activity port of the I.M.C.C.

5.3.6 Remove the portable E.G.G. Ortec detector from the Dewar and place properly in the gaseous activity port of the I.M.C.C.

5.3.7 Request the RPD to have the detector operationally checked from the R.A.F. using the ND 6700.

NOTE: The detector must be functioning properly prior to continuing with this procedure.

5.3.8 Dry the expansion vessel: Turn V-11 to "Argon"
OPEN V-9
OPEN V-8.2
OPEN V-10

5.3.9 Adjust RC-VREL-2 as necessary to obtain 20 psi on RC-G-3 for 1 minute. Observe flow indication on RC-FI-2 also.

5.3.10 Upon completion of Drying Expansion Vessel:

Turn V-11 to 9 o'clock position
SHUT V-9
SHUT V-8.2

5.3.11 Have Control Room Operator open RC-422 and RC-423 (not required for sample from RHR).

5.3.12 At the Sample Acquisition Panel:

For RCHL Sample: OPEN CC-314
OPEN RC-423-1

For RHR Sample: OPEN CC-316
OPEN RHR 81-A (81-B)

For all samples: Turn RC-437-1 (or 437-2) to DDT

5.3.13 At the Liquid Sample Panel: OPEN V-3
OPEN V-1.2 (V-1.1 for RHR)

5.3.14 Regulate Reactor Coolant (RHR) flow using RC-VREL-1 until flow indicator RC-FI-1 indicates between 35 to 40 inches of water. Maintain this purge for a minimum of 5 minutes.

NOTE: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.3.15 Evacuate the Gas Expansion Vessel, sample bottle and tubing:

OPEN V-13
OPEN V-15
TURN DV-2 to 6 o'clock position
OPEN V-12

5.3.16 When vacuum on RC-G-2.2 reads 22 inches vacuum or greater, turn DV-2 to 3 o'clock position.

5.3.17 When vacuum on RC-G-2.1 reads 22 inches of vacuum or greater:

SHUT V-15
SHUT V-13
SHUT V-10
TURN V-11 to Closed
SHUT V-12

NOTE: Observe vacuum reading on both gauges holding steady.

5.3.18 Upon completion of purge (from step 5.3.14):

SHUT V-3
OPEN V-8.2
OPEN V-8.1
OPEN V-2

5.3.19 Regulate Reactor Coolant (RHR) flow using RC-VREL-2 until flow indicator RC-FI-2 indicates 18 to 22 inches of water. Maintain this purge for a minimum of 3 minutes.

NOTE: A d/p of 18 to 22 inches of water on RC-FI-2 is equal to approximately 200 cc/min flow rate.

5.3.20 Upon completion of sample purge:

SHUT V-8.2
SHUT V-8.1
SHUT V-1.2 (V-1.1 for RHR)
OPEN V-9
OPEN V-16 (for 1 full minute)

5.3.21 Upon completion of gas stripping, commence LSP flush:

SHUT V-16
SHUT V-9
OPEN V-8.2
OPEN V-8.1
OPEN V-4
TURN V-11 to 9 o'clock position

5.3.22 At the CMP, operate the GC mini-computer to draw a vacuum on all 4 sample loops.

5.3.23 At the LSP open V-15 and allow the gas sample to transfer to the GC.

5.3.24 Operate the GC unit to obtain 4 samples for hydrogen determination. By selective attenuation, starting with a high value, determine the hydrogen concentration.

NOTE: At this time inform the RPD that the gaseous activity sample is in the I.M.C.C. and request that he have it analyzed using the ND 6700, as per RC-C-10.

5.3.25 Have Control Room Operator shut RC-422 and RC-423 (not required for RHR sample).

5.3.26 At the Sample Acquisition Panel:

For RCHL Sample: OPEN FPC-51
OPEN FPC-51-14

For RHR Sample: SHUT RHR 81-A (81-B)
OPEN FPC-51
OPEN FPC-51-41

5.3.27 At the Liquid Sample Panel: SHUT V-4
SHUT V-2
SHUT V-8.1
SHUT V-8.2
OPEN V-3
OPEN V-1.2 (V-1.1 for RHR)

Using V-REL-1, regulate flush water flow rate of 35 to 40 inches of water on RC-FI-1. Maintain this flush for a minimum of 5 minutes.

NOTE 1: A d/p of 35 to 40 inches of water on RC-FI-1 is equal to approximately 1/2 gpm flow rate.

5.3.28 At the completion of flushing: SHUT V-1.2 (V-1.1 for RHR)
SHUT V-3

5.3.29 At the Sample Acquisition Panel:

For RCHL Samples: SHUT RC-423-1
SHUT FPC-51-14
SHUT FPC-51
SHUT CC-314

For RHR Sample: SHUT RHR 81-A (81-B)
SHUT FPC-51-41
SHUT FPC-51
SHUT CC-316

For all samples: TURN RC-437-1 (or 437-2) to VCT.

5.3.30 At the LSP flush the expansion vessel.

SHUT V-15
OPEN V-8.2
OPEN V-9
TURN V-11 to "DI Water" position

Allow system to flush for 2 minutes.

5.3.31 Upon completion of flush: Turn V-11 to "Argon" position and blow expansion vessel dry

5.3.32 Upon completion of drying expansion vessel:

TURN V-11 to Close
SHUT V-9
SHUT V-8.2

NOTE: Prior to continuing with the next step, verify with the RPD that all counting of the sample has been completed.

5.3.33 Remove radioactive gases from gas system:

OPEN V-10
OPEN V-13
OPEN V-15
TURN V-11 to 9 o'clock position
OPEN V-12

Evacuate system for 1 full minute.

5.3.34 Upon evacuation of gas system:

SHUT V-12
TURN V-11 to "closed" position
SHUT V-15
SHUT V-13
SHUT V-10

Attachment 1

VALVE LINEUP SHEET

Sample Acquisition Panel

FPC-51	Sample Flush Line Iso.	CLOSE
FPC-51-41	RHR Sample Flush	CLOSE
RHR 81-A	RHR SMPL Iso A Aux Cool	CLOSE
RHR 81-B	RHR Smpl Iso B Aux Cool	CLOSE
FPC 51-14	RCHL Smpl Flush	CLOSE
RC-423-1	RCHL Smpl	CLOSE
FPC-51-31	M/B Demin Inlet Flush	CLOSE
LD-71	M/B Demin Inlet Iso	CLOSE
LD-75	M/B Demin Inlet Smpl	CLOSE
FPC-51-21	M/B Demin Outlet Flush	CLOSE
LD-81	M/B Demin Outlet Iso	CLOSE
LD-85	M/B Demin Outlet Smpl	CLOSE
FPC-51-12	Pzr Stm Sp Smpl Flush	CLOSE
RC-403-1	Przr Stm Sp Smpl	CLOSE
FPC-51-13	Pzr Liq Sp Smpl Flush	CLOSE
RC-413-1	Pzr Liq Sp Smpl	CLOSE
CC-314	RX Cool HRS Hx CC Flow	CLOSE
CC-316	RHR HRS Hx CC Flow	CLOSE
MGR-545	VCT Gas Sp Smpl Iso A	CLOSE
MGR-545-1	VCT Gas SP Smpl Iso B	CLOSE
RC-437-1	Smpl Purge Divert A	TO VCT
RC-437-2	Smpl Purge Divert B	TO VCT

Attachment 1 (cont'd)

Liquid Sample Panel

V-17	Open Grab Sample	SHUT
V-6.1	Rem Smpl Bomb Inlet	SHUT
V-6.2	Rem Smpl Bomb Outlet	SHUT
V-5.1	Rem Smpl Bomb Inlet Iso	SHUT
V-5.2	Rem Smpl Bomb Outlet Iso	SHUT
V-REL-1	RC Purge Throttle	THROTTLED
V-3	RC Purge Stop	SHUT
V-REL-2	RC Purge to Waste Th	THROTTLED
V-7	Smpl Bomb Bypass	SHUT
V-2	RC Purge to Waste Stop	SHUT
V-1.1	RHR Smpl Iso	SHUT
V-1.2	RCHL/Pzr Smpl Iso	SHUT
V-1.3	(Spare)	SHUT
V-1.4	(Spare)	SHUT
V-1.5	VCT Gas Sp Smpl Iso	SHUT
V-4	DI Water Flush Iso	SHUT
V-8.1	Press Smpl Bomb Inlet	SHUT
V-8.2	Press Smpl Bomb Outlet	SHUT
V-9	Expansion Vessel Inlet	SHUT
V-16	Argon Gas Strip Purge	SHUT
V-18	RC Backflush	6 o'clock
V-19	Undiluted Liq Smpl	BYPASS
V-22	RC Purge Waste/CAP	WASTE

Attachment 1 (cont'd)

Liquid Sample Panel (cont'd)

DV-1	Diluted Liquid Sample	BYPASS
V-11	Expansion Vessel Outlet	SHUT
DV-2	Diluted Gas Smpl	9 o'clock
V-10	Expansion Vessel Vacuum	SHUT
V-13	Dil Gas Smpl Vac	SHUT
V-14	Argon Purge to Dil Gas Smpl	SHUT
V-15	Gas Smpl to GC	SHUT
V-12	Argon to Eductor	SHUT

Liquid Sample Panel (Demin Sect)

DMV-1.1	CVCS Demin Inlet Iso	SHUT
DMV-1.2	CVCS Demin Outlet Iso	SHUT
DMV-1.3	(Spare)	SHUT
DMV-3	DI Water Flush	SHUT
DMV-2.1	CVCS Demin Inlet Smpl	SHUT
DMV-2.2	CVCS Demin Outlet Smpl	SHUT
DMV-2.3	(Spare)	SHUT

Attachment 1 (cont'd)

CASP Control Panel

AV-1/SV-1.2	Smpl Pos #1	Inlet/Outlet	CLOSE
SV-2.1/SV-2.2	Smpl Pos #2	Inlet/Outlet	CLOSE
SV-3.1/SV-3.2	Smpl Pos #3	Inlet/Outlet	CLOSE
SV-4.1/SV-4.2	Smpl Pos #4	Inlet/Outlet	CLOSE
SV-5	Smpl Bypass		CLOSE
SV-10	Nitrogen to Eductor		CLOSE
AV-2	Return to Containment		CLOSE
SV-6	Eductor Suction Iso		CLOSE

(At Sample Acquisition Panel)

AS110A	Cont Air Smpl A Iso	CLOSE
AS110B	Cont Air Smpl B Iso	CLOSE

Attachment 1 (cont'd)

Chemical Analytical Panel

V-2	IC Smpl Outlet	OPEN
V-5	IC Loop Select	SHUT
V-6	O_2 Loop Select	O_2 - Cal
V-7	O_2 Analyzer Select	YSI
V-8	O_2 Loop Outlet	OPEN
V-9	O_2 Anal Cal Supply	SHUT
V-10	Inst Air Supply	OPEN
V-11	DI Water Supply	OPEN
V-12	Nitrogen Supply	OPEN
V-14	Argon Supply to GC	OPEN
V-15	Cal-3 Supply	OPEN
V-17	O_2 Cal Tk Recirc	SHUT
V-18	O_2 Cal Tk Drain	SHUT
V-19	Cal-3 Drain	SHUT
V-20	pH Cal Tk 2 Drain	SHUT
V-13	IC Inject Port	SHUT
V-16	pH Cal Tk 2 Supply	SHUT
V-25	pH Cal Tk 1 Drain	SHUT
V-27	pH Cal Tk 1 N_2 Supply	VENT
V-28	pH Cal Tk 2 N_2 Supply	VENT
V-29	Cal-3 N_2 Supply	VENT
V-30	pH Cal Tk Select	CAL-1
V-26	pH Cal Tk 1 Supply	SHUT
V-24	O_2 Cal Tk Fill	SHUT

I.M.C.C. CONTROL PANEL

HS-3	Dilution Water Bite Valve	OFF
HS-4	Air/Water Flush Valve	OFF
HS-5	Pressurized Reactor Cool to I.M.C.C.	OFF
HS-6	Reactor Cool. Bite Valve	OFF
HS-7	Mixing Chamber Flush/Vent Valve	OFF
HS-8	Undil. RX. Cool. Smpl. Outlet Valve	OFF
HS-9	Undil. RX. Cool. Smpl/Divert Valve	OFF
HS-10	Mixing Chamber Outlet Valve	OFF
HS-11	Dil. RX. Cool. Smpl. Outlet Valve	OFF
HS-12	Depressurized Rx. Cool. to I.M.C.C.	OFF
HS-13	Degassifier Outlet/Flush Valve	OFF
HS-14	Dil. Wtr. Outlet Valve	OFF
HS-15	Air Flush to Mixing Chamber	OFF
Main Power Switch		ON

WISCONSIN PUBLIC SERVICE CORPORATION

Kewaunee Nuclear Power Plant

EMERGENCY PLAN IMPLEMENTING PROCEUDRE

NO. EP-RET-5 REV. B

TITLE: Plume Projection

DATE: JUL 26 1983 PAGE 1 of 4

REVIEWED BY M L Marchi / John Richard

APPROVED BY [signature]

1.0 APPLICABILITY

This procedure is applicable for all abnormal releases of airborne radioactivity.

2.0 PRECAUTIONS

2.1 This program utilizes a straight line Gaussian model to determine diffusion coefficients. The model does not take into account building wake, lake effects, or inland wind shifts.

2.2 Isotopic input data is limited to the predominent fission gases and iodine 131. The program can be used to calculate X/Q's for subsequent hand calculation of ground level concentrations. Dose projections can then be made using EP-RET-6.

2.3 The dose data is only valid for releases from the Auxiliary Building stack in Zone SV mode. The X/Q values can be used for the Shield Building Vent.

2.4 The procedure requires use of the Green Bay IBM Computer. If terminal access is not available, see EP-ENV-3C.

3.0 REFERENCES

3.1 NRC Regulatory Guide 1.145, August 1979.

3.2 NRC Regulatory Guide 1.23, Rev. 1 (Proposed), September 1980.

4.0 APL USER INFORMATION

4.1 The minus sign (-) is the upper case 2.

4.2 The plus sign (+) is not required when using scientific notation.

4.3 # means depress the enter key.

4.4 The closed bracket sign) must be entered using the red).

4.5 To clear the screen hold down the ALT key and depress the clear key.

4.6 If the terminal locks up because of an entry error, type in DOSE # (see 5.9). This will restart the program.

4.7 The letter Y shall be used for all yes answers and N for all no answers.

5.0 INSTRUCTIONS

5.1 Complete Plume Projection Data Sheet (Form RET-5.1). All data should be available in the TSC.

5.2 Sign on with

5.3 Turn on the APL Keyboard by holding down the ALT key and then depressing the APL on/off key.

5.4 RUN 1 APL #

5.5 Clear the screen.

5.6 KNPP #

5.7 DRILL #

5.8)LOAD ISODOSE #

5.9 DOSE # (This starts the program).

5.10 Answer the questions one at a time as they appear using the data from Form RET-5.

6.0 DOSE PROJECTION FROM STACK ANALYTICAL RESULTS

6.1 Enter the delta T (or sigma theta) and wind speed.

6.2 Enter the expected release duration.

6.3 Enter the isotopic concentrations. Separate each concentration by a space.

NOTE: Plus signs are not required but minus signs (upper case 2) are.)

6.4 The program will echo the input data and ask if the data is correct.

6.5 The program then computes whole body dose, iodine concentration, child thyroid dose, impact time of the plume, and X/Q at mile intervals along the plume centerline out to ten miles. Whole body dose and iodine concentration is also computed along isodose lines based on each factor of 10 reduction in X/Q.

7.0 DOSE PROJECTION FROM SPING 4 DATA

7.1 Enter meteorological data and expected release duration.

7.2 When asked for stack sample analysis results answer No or N.

7.3 The program will ask if you have SPING readings and which exhaust SV fans are running.

7.4 The iodine average requested is the last 10 minute average from the SPING4.

7.5 The noble gas average requested is the last 10 minute average from the SPING4. If the reading is from the midrange or high range channel, convert from gamma Bq Mev/cc to uCi/cc prior to entering the value.

NOTE: The conversion factors are posted on the SPING consoles.

7.6 The program calculates the noble gas isotopic mixture from the predicted core inventory as a function of time after trip. The results are used to make the plume projection.

8.0 MAIN STEAM LINE RELEASES

8.1 Enter the meteorological data.

8.2 Enter the release duration. This duration is the time the steam dump valves were (or are expected to be) open.

8.3 Answer No (N) when asked for stack sample results.

8.4 Answer No (N) when asked for SPING readings.

8.5 The program will request the reading in R/hr from the main steam line direct radiation monitor.

8.6 The program requests safety injection flow rate and assumes this value to be the rate of water loss through a primary to secondary tube rupture. If the charging system is maintaining pressurizer levels, use the charging flow rate.

8.7 The program then calculates the dose projection.

9.0 RESULTS ANALYSIS

9.1 Make a hard copy of the Dose Projection and transmit to the Radiological Protection Director.

9.2)OFF HOLD #

9.3 OUTPUT * # (the * is an upper case P).

9.4 LOAD DRILL #

9.5 RUN HCPY #

9.6 PRINT DRILL NOL # (The hard copy prints out at this time on the printer assigned to hard copy.)

9.7 OFF #

FORM RET-5
PLUME PROJECTION DATA SHEET

Reactor Trip Date _____ Time _____

MET Conditions: ± T _____ °F Wind Speed _____ mph

Sigma Theta _____ ° Wind Direction _____ °

Expected Release Duration _____ hrs

Operating Fans Aux A Aux B Both SVA SVB Both None (circle one)

Stack Analytical Results:

Isotope	Conc.(uCi/cc)
Kr 85	
Kr 85m	
Kr 87	
Kr 88	
Xe 133	
Xe.133m	
Xe 135	
Xe 135m	
I-131	

Flow Rates cc/sec	Aux A	Aux B	Both	SVA	SVB	Both
	2.04E+7	1.96E+7	3.36E+7	4.36E+6	4.00E+6	8.61E+6

SPING RESULTS

Latest 10 min Iodine Average _____ uCi/cc Latest 10 min Gas Average _____ uCi/cc

STEAM RELEASE

Main Steam Line Monitor _____ R/hr SI flow rate _____ gpm

BY _____ DATE _____ TIME _____

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEUDRE	NO. EP-RET-6 REV. B TITLE: Dose Projection DATE: JUL 26 1983 PAGE 1 of 3
REVIEWED BY [signature]	APPROVED BY [signature]

1.0 APPLICABILITY

The dose rates calculated by this procedure can be used to determine action levels of Alert, Site Emergency, and General Emergency. The procedure can also be utilized to predict individual doses from submersion or inhalation of radioactive materials.

2.0 PRECAUTIONS

None

3.0 REFERENCES

None

4.0 INSTRUCTIONS

4.1 Call up VSPC with

4.2 Type in RUN ODP and enter.

4.3 Press the PF-1 key.

NOTE: Make sure the keyboard is not in the APL mode.

4.4 Press PF-2 key. The screen is now in the view mode and isotopes are listed by isotope code number (isotopes 1-19).

4.5 Type in all the ground level concentrations from the Form RC-HP-110 or Form AD-11.2 for a specific ground level point (e.g., ST HWY 42 NW).

4.6 Press PF-3 key. Screen will list isotopes 20-39; repeat step 4.5.

4.7 Isotope number 40 plus date, time, location, and comments will appear on the screen.

4.9 Type in the following:

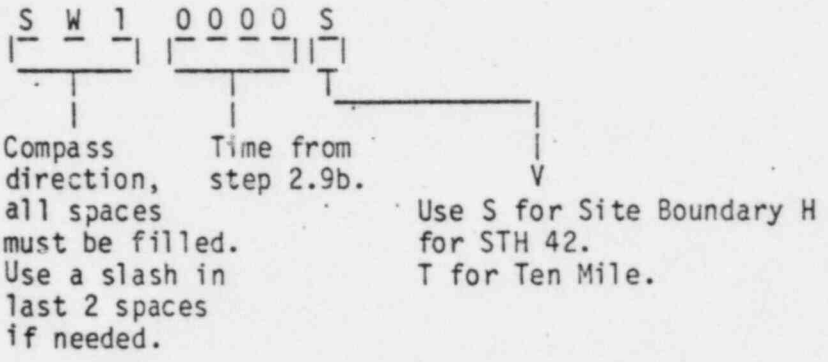
a. Ground level concentration for isotope number 40, if needed.

b. Sample date and time.

c. Location, ground level point from step 4.5.

d. Comments, any explanatory or informational notes.

4.10 Press PF-5 key. SAVE will appear in the command space and a code should be entered for calling up the above file at a later date. Type in the code as follows and enter: (Record the file name.)



4.11 Press PF-6 key. Type in file code name from step 4.10 and enter. Note and record job number (i.e., KJ228R00-000).

4.12 Press PF-7 key. Type in the two digits after the R in the job number and enter.

4.13 The computer will then calculate and print out the results. Make a printout of the information on the screen and transmit data immediately to the Radiological Protection Director.

5.0 EMERGENCY CLASS DETERMINATION (RADIOLOGICAL PROTECTION DIRECTOR)

5.1 Compare the results obtained in section 4.13 with Table 1 considering the sample type.

NOTE: The Action Limits in Table RET-6 are based on State Protective Action Guides for protection of the public. They do not correspond in all cases to the Emergency Classes stated in EP-AD-2.

5.2 Report any recommendations to the Emergency Director.

TABLE RET-6

SAMPLE TYPE	LOCATION	DATA ANALYSIS	ACTION LIMITS I	II	III
Gas Effluent SPING 4 GRAB	Aux Stack	EP-RET-5, EP-RET-6 (10 hour exposure)	Whole Body <1 REM Thyroid <5 REM	Whole Body 1-5 REM Thyroid 5-25 REM	Whole Body >5 REM Thyroid >25 REM
HiVol/RAP	In Plume	Gros beta-gamma Gamma Scan RC-HP-46, EP-RET-6	Whole Body <1 REM Thyroid <5 REM	Whole Body 1-5 REM Thyroid 5-25 REM	Whole Body >5 REM Thyroid >25 REM
Liquid Effluent GRAB	R-24	1 l. gamma scan			
		I-131 (uCi/ml)	< 1.2 E-5	1.2 E-5 to 1.2 E-4	>1.2 E-5
		Cs-137 (uCi/ml)	< 3.4 E-4	3.4 E-4 to 3.4 E-3	>3.4 E-3
Direct Survey	In Plume 1 m. above Ground	None	< 2.5mR/hr	2.5 to 12 mR/hr	>12 mR/hr
Deposition (Fallout Plate)	In Plume at Ground Level	Gross beta-gamma Gamma Scan RC-HP-46	< 1 E+6 dpm	1 E+6 to 3.5 E+7 dpm	>3.5 E+7
Milk or Water	At request of State Radiological Coordinator	1 l. gamma scan			
		I-131 (uCi/ml)	< 1.2 E-5	1.2 E-5 to 1.2 E-4	>1.2 E-4
		Cs-137 (uCi/ml)	< 3.4 E-4	3.4 E-4 to 3.4 E-3	>3.4 E-3
Environmental TLD	In Plume	Integrated Dose Readout	None	None	1 REM Total integrated dose

Action Limits

I Transmit data to State Radiologcial Coordinator & Emergency Director. No recommended actions.

II Recommend sheltering and transfer of livestock to stored feed. (Preventative Action Level)

III Recommend evacuation and restrict access to area. Recommend transfer of livestock to stored feed. (Emergency Action Level)