Kewaunee Nuclear Power Plant
N490 Highway 42
Kewaunee, WI 54216-9511
920.388.2560

Point Beach Nuclear Plant
6610 Nuclear Road
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920.755.2321

NMC
Committed to Nuclear Excellence

Kewaunee / Point Beach Nuclear
Operated by Nuclear Management Company, LLC

NRC-02-009

January 16, 2002

10 CFR 50, App. E

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

DOCKET 50-305
OPERATING LICENSE DPR-43
KEWAUNEE NUCLEAR POWER PLANT
RADIOLOGICAL EMERGENCY RESPONSE PLAN IMPLEMENTING PROCEDURES

Pursuant to 10 CFR 50 Appendix E, attached is the latest revisions to the Kewaunee Nuclear Power Plant Radiological Emergency Response Plan Implementing Procedures (EPIPs). These revised procedures supersede the previously submitted procedures.

Pursuant to 10 CFR 50.4, two additional copies of this letter and attachment are hereby submitted to the Regional Administrator, U. S. Nuclear Regulatory Commission, Region III, Lisle, Illinois. As required, one copy of this letter and attachment is also submitted to the Kewaunee Nuclear Power Plant NRC Senior Resident Inspector.

Sincerely,

Thomas J. Webb
Site Licensing Director

SLC

Attachment

cc - US NRC Senior Resident Inspector, w/attach.
US NRC, Region III (2 copies), w/attach.
Electric Division, PSCW, w/o attach.
QA Vault, w/attach.

A045

DOCUMENT TRANSMITTAL

KEWAUNEE NUCLEAR POWER PLANT

FROM: **DIANE FENCL - KNPP** TRANSMITTAL DATE 01-15-2002

EMERGENCY PLAN IMPLEMENTING PROCEDURES TRANSMITTAL FORM

OUTSIDE AGENCY COPIES (1-20)

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T. Webb - NRC Region III (2 & 3)*
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T. Webb - State of Wisconsin (5)*
T. Webb - KNPP QA Vault w/NRC Letter (15)*
Krista Kappelman - PBNP - EP (10)*
Craig Weiss - Wisconsin Power & Light (11)*
Jim Holthaus - Nuclear Management Company (12)*

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L. Welch - Fuel Services (65)
NO Library - KNPP (59)
C. Sternitzky - ATF-2 (44)
D. Braun - ATF-3 (45)
P. Ehlen - I&C Office (42)
M. Daron - Security Building (46)
P&FS Adm - GB D2-3 (EOF) (81)
H. Kocourek - OSF (52)
C. Hutter - ATF-1 (64)
LOREB - STF (62, 66, 67, 68, 70, 72, 73, 74)
STF Library (43)
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D. Schrank - Maintenance Off. (41)
D. Krall - CR/SS Office (51, 56)
P&FS Adm - GB-D2 (Nuclear Library) (84)
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W. Galarneau - RAF (53)
W. Galarneau - SBF/EMT (54)
W. Galarneau - RPO (55)

WORKING COPIES (101-199) These copies of procedures are kept in the areas designated for use in response to an emergency. These are not complete sets, but contain only those procedures that are used to implement activities in the location where they are kept. Please dispose of any sections distributed that are not tabbed in the indicated copy.

W. Galarneau - RAF/RPO (106, 107)
W. Galarneau - SBF/ENV (108, 109)
W. Galarneau - SBF/EM Team (110, 111, 111A)
W. Galarneau - Aurora Medical Center (118, 119)
W. Flint - Cold Chem/HR Sample Room (113)
N. Deda - SBF/SEC (114)
D. Krall - CR/Communicator (116)(Partial Distribution)
Simulator/Communicator (117)
M. Fencl - Security (121)
N. Deda - Security Building (120)
S. VanderBloomen (125)
J. Stoeger (126)

Originals to KNPP QA Vault

Please follow the directions when updating your EPIP Manual. WATCH FOR DELETIONS!!! These are controlled procedures and random checks may be made to ensure the manuals are kept up-to-date.

*THIS IS NOT A CONTROLLED COPY. *IT IS A COPY FOR INFORMATION ONLY.*

KEWAUNEE NUCLEAR POWER PLANT
REVISION OF EMERGENCY PLAN IMPLEMENTING PROCEDURES
January 15, 2002

Please follow the directions listed below. If you have any questions regarding changes made to the EPIPs, please contact Dave Seebart at ext. 8719. If you are a controlled copy holder (see cover page), return this page to Diane Fencl by February 15, 2002, SIGNED AND DATED to serve as a record of revision.

EPIP Index, dated 01-15-2002.

REMOVE		INSERT	
PROCEDURE	REV.	PROCEDURE	REV.
EP-RET-3C	O	EPIP-RET-03C	P
EP-RET-3D	M	EPIP-RET-03D	N

Return a signed and dated copy of this transmittal letter, within 10 days of receipt, to the sender. If you have any questions or comments, please call Dave Seebart.

I CERTIFY Copy No._____ (WPSC No.) of the Kewaunee Nuclear Power Plant's EPIPs has been updated.

_____
SIGNATURE DATE

Please return this sheet to *DIANE FENCL*.

C.L. S for
Diane Fencl

Enclosure

EMERGENCY PLAN IMPLEMENTING PROCEDURES

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EPIP-AD-02	Emergency Class Determination	AC	11-15-2001
EPIP-AD-03	KNPP Response to an Unusual Event	AD	12-14-2001
EPIP-AD-04	KNPP Response to Alert or Higher	AF	12-14-2001
EP-AD-5	Site Emergency	**Deleted**	04-27-87
EPIP-AD-05	Emergency Response Organization Shift Relief Guideline	C	06-05-2001
EP-AD-6	General Emergency	**Deleted**	04-24-87
EPIP-AD-07	Initial Emergency Notifications	AN	11-15-2001
EP-AD-8	Notification of Alert or Higher	**Deleted**	02-26-96
EP-AD-9	Notification of Site Emergency	**Deleted**	04-27-87
EP-AD-10	Notification of General Emergency	**Deleted**	04-27-87
EPIP-AD-11	Emergency Radiation Controls	Q	09-27-2001
EP-AD-12	Personnel Assembly and Accountability	**Deleted**	03-26-94
EP-AD-13	Personnel Evacuation	**Deleted**	04-25-94
EP-AD-13A	Limited Area Evacuation	**Deleted**	03-01-83
EP-AD-13B	Emergency Assembly/Evacuation	**Deleted**	03-01-83
EP-AD-13C	Site Evacuation	**Deleted**	03-01-83
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EPIP-AD-15	Recovery Planning and Termination	O	10-30-2001
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EP-ENV-3A	Environmental Protection Director Actions and Directives	**Deleted**	09-26-84
EP-ENV-3B	EM Team Actions	**Deleted**	09-26-84
EPIP-ENV-03C	Dose Projection Using RASCAL Version 2.2 Software	V	10-09-2001
EP-ENV-3D	Revision and Control of ISODOSE II	**Deleted**	02-14-95
EP-ENV-3E	Manual Determination of X/Q	**Deleted**	04-24-87
EP-ENV-3F	Manual Determination of X/Q (Green Bay Meteorological Data)	**Deleted**	05-30-86
EP-ENV-3G	Manual Dose Projection Calculation	**Deleted**	06-02-89
EP-ENV-3H	Protective Action Recommendations	**Deleted**	04-13-90
EPIP-ENV-04A	Portable Survey Instrument Use	S	06-15-2000
EPIP-ENV-04B	Air Sampling and Analysis	W	10-09-2001
EP-ENV-4C	Environmental Monitoring Teams	**Deleted**	04-13-90
EPIP-ENV-04C	Ground Deposition Sampling and Analysis	W	10-09-2001
EPIP-ENV-04D	Plume Tracking for Environmental Monitoring Teams	N	10-02-2001
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EP-ENV-5B	MS-3 Operation	**Deleted**	04-14-86
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EP-ENV-7	Site Access Facility Communications	**Deleted**	09-26-84
EP-ENV-8	Total Population Dose Estimate Calculations	**Deleted**	04-14-86
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EPIP-EOF-02	Emergency Operations Facility (EOF) Activation	Z	11-29-2001
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EP-EOF-9	Interface with Support Organizations	**Deleted**	03-05-84
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EPIP-OSF-03	Work Requests During an Emergency	O	09-27-2001
EP-OSF-4	Operational Support Facility Communications	**Deleted**	04-24-87
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EPIP-RET-02D	Emergency Radiation Entry Controls and Implementation	M	06-12-2001
EP-RET-2E	Handling of Injured Personnel	**Deleted**	04-16-96
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EPIP-RET-04A	SBF Operation/Relocation	**Deleted**	10-02-2001
EP-RET-4B	Radiological Controls at Site Access Facility	**Deleted**	07-12-94
EP-RET-4C	Site Radiological Monitoring	**Deleted**	07-12-94
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EPIP-SEC-02	Security Force Response to Emergencies	W	08-28-2001
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EPIP-SEC-03	Personnel Assembly and Accountability	AC	12-14-2001
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EPIP-TSC-04	Emergency Physical Changes, Major Equipment Repair	M	10-02-2001
EP-TSC-5	Technical Support Center Communications Equipment	**Deleted**	04-24-87
EP-TSC-6	Assessment of Reactor Core Damage	**Deleted**	09-30-86
EPIP-TSC-07	RV Head Venting Time Calculation	I	10-19-2001
EPIP-TSC-08A	Calculations for Steam Release from Steam Generators	N	12-14-2001
EPIP-TSC-08B*	STMRLS Computer Program	F	10-02-2001
EP-TSC-8C*	See EP-TSC-8B	**Deleted**	04-16-92
* EP-TSC-8B was totally deleted; therefore, EP-TSC-8C was changed to EP-TSC-8B			
EP-TSC-9	Core Damage Assessment Using Released Radionuclides	**Deleted**	09-30-86
EP-TSC-9A*	Core Damage Assessment	I	02-23-99
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* EP-TSC-9A, Rev. D was totally deleted; therefore, EP-TSC-9B became EP-TSC-9A. EP-TSC-9B was previously EP-TSC-9C.			
EPIP-TSC-10	Technical Support for IPEOPs	I	03-20-2001

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APPX-A-6	EP-FIG-037	- - -	Floor Plan - Corporate Response Center	**Deleted**	08-04-98
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ENV-01-03	Meteorological and Plant Status Data	C	12-14-2001
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EOF-04-01	SRCL Initial Action Checklist	C	12-14-2001
EOF-04-02	Telephone Communications Log Sheet	A	12-14-2001
EOF-08-03	Fax for Emergency Declaration or Status Updates	G	11-27-2001
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RET 2B.2	Auxiliary Building Stack (Grab Sample)	C	04-16-96
RET 2B.3	Auxiliary Building Stack (Sping Reading)	C	04-16-96
RET 2B.4	Containment Stack (Sping Reading)	B	04-16-96
RET 2B.5	Steam Release	C	04-16-96
RET 2B.6	Field Reading (Grab Sample)	A	04-16-96
RET-04-01	SAM-2 Counting Equipment Worksheet	E	06-12-2001
RET 8.3	Hospital Survey 1	**Deleted**	06-05-2001
RET 8.4	Hospital Survey 2	**Deleted**	07-25-97
RET 8.5	Hospital Survey 3	**Deleted**	07-25-97
RET-08-06	Hospital Survey 4	F	06-15-2000
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TSC-02-01	TSC and OSF Activation Checklist	O	09-27-2001
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TSC-03-02	Plant Equipment Status	L	06-12-2001
TSC-03-03	Environmental Status Board	J	06-12-2001
TSC-03-04	Radiation Monitors	I	01-08-2002
TSC-04-01	Emergency Physical Change Request	F	08-29-2000
TSC-04-02	Emergency Physical Change Safety Review	F	08-29-2000
TSC-04-03	Emergency Physical Change Index	F	08-29-2000
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TSC-08A-01	Steam Release Data Sheet (Energy Balance)	H	12-14-2001
TSC-08A-02	Steam Release Calculation Sheet (Energy Balance)	G	12-14-2001
TSC-08A-03	Steam Release Data/Calculation Sheet (Open Valve)	E	12-14-2001
TSC-08A-04	Steam Release Data/Calculation Sheet (STMRLS Program)	D	12-14-2001
TSC 9A.1	Core Damage Based on Reactor Vessel Level & Fuel Rod Temp.	C	02-14-95
TSC 9A.2	Core Damage Based on Radiation Monitors	C	02-14-95
TSC 9A.3	Cs-134 and Cs-137 PCF Determination	D	04-16-96
TSC 9A.4	Core Damage Based on Activity Ratios	C	02-14-95
TSC 9A.5	Core Damage Assessment (Monitoring Data)	D	04-16-96
TSC 9A.6	Core Damage Summary	C	02-14-95

WISCONSIN PUBLIC SERVICE CORP. Kewaunee Nuclear Power Plant *Emergency Plan Implementing Procedure*	No. EPIP-RET-03C	Rev. P
	Title Post Accident Operation of the High Radiation Sample Room	
	Date JAN 15 2002	Page 1 of 34
Reviewed By [signature]	Approved By David R Seebert	

Nuclear Safety Related	☑ Yes ☐ No	PORC Review Required	☑ Yes ☐ No	SRO Approval Of Temporary Changes Required	☑ Yes ☐ No

1.0 Purpose

1.1 This procedure provides instruction for operation of the High Radiation Sample Room (HRSR) to obtain the following primary coolant samples under post accident conditions:

a. Diluted liquid sample of primary coolant for: (Step 5.1)
   - Boron analysis
   - Gamma isotopic analysis

b. An inline liquid sample for: (Step 5.2)
   - pH
   - Oxygen
   - Conductivity
   - Chlorides

c. An inline undiluted gas sample for hydrogen analysis. (Step 5.3)

d. A diluted gas sample for gamma isotopic analysis. (Step 5.3)

e. An undiluted liquid sample for off-site analysis. (Step 5.4)

f. Operation of 1A and 1B Hydrogen Analyzers for Containment. (Step 5.5)

g. Flush of liquid sample lines. (Step 5.6)

2.0 General Notes

2.1 This procedure is designated CONTINUOUS USE.

2.2 The following is a list of acronyms that are used throughout this procedure:

- CAP Chemical Analysis Panel
- CASP Containment Air Sampling Panel
- CMP Chemical Analysis Monitor Panel
- DDT Deaerated Drain Tank
- HVAC/CCP HVAC/Containment Air Sample Control Panel
- HP/RPD Health Physics/Radiation Protection Director
- HRSR High Radiation Sample Room RCHL
- LSP Liquid Sample Panel
- RCHL Reactor Coolant Hot Leg
- SAP Sample Acquisition Panel

3.0 Precautions and Limitations

3.1 Process an Emergency Radiation Work Permit per EPIP-AD-11, "Emergency Radiation Controls."

3.2 Contact Radiation Protection Group (HP) for:

3.2.1 Proper personnel dosimetry

3.2.2 Proper radiation detection instrumentation

3.2.3 Personnel for continuous HP coverage during sampling

3.2.4 Remote area monitor readings in area of HRSR

3.3 Utilize on-site communications with the HP/RPD, as necessary, during sampling.

3.4 Containment sump pH should be adjusted to a pH > 7 within 48 hours following the initiation of recirculation during a small break loss of coolant accident.

3.5 If the sample flow is lost during the performance of this procedure and the valve line-up is confirmed, a sample high temperature condition may exist.

- No direct temperature indicator is available.
- Sample flow is automatically isolated when sample temperatures exceed 120°F and automatically resets when the temperatures are reduced.
- If sample flow is restored without having to take action, then high temperature isolation is confirmed.
- Such a high temperature condition may arise if the Component Cooling flow is isolated or Component Cooling temperatures are high. Component Cooling temperatures may be observed using the plant process computer.
- High Component Cooling temperature may occur if Service Water temperatures are elevated.

3.6 IF the loss of sample flow is confirmed to be due to high Component Cooling temperatures, THEN discuss the concern with Operations or the Technical Support Center and discuss opportunities to reduce Service Water heat loads to allow for better performance of Component Cooling.

3.7 Transit routes to and from the HRSR per HP/RPD recommendations.

3.8 Monitor radiation levels in the HRSR upon entry and during sample manipulations.

3.9 Radiation level monitoring is required if accessing the maintenance areas behind the panels.

3.10 IF sufficient sample flow is not achieved, THEN extend the purge time as required to compensate for the reduced flow rates.

4.0 Initial Conditions

4.1 This procedure shall be implemented upon declaration of an **Alert, Site Emergency, General Emergency**, or when directed by the Shift Manager or Emergency Director.

5.0 Procedure

5.1 Diluted Liquid Sample for Boron Analysis and Isotopic Analysis

5.1.1 In the HRSR check the following equipment available and operational:

- Drying oven on at 55°C to 60°C
- All material required to perform RCC-082, "Boron Analysis Curcumin Method."
- Multi-Channel Analyzer available for counting (Technical Support Center)
- 2 - 1 liter poly bottles
- Shielded aliquoter available
- New 60 ml diluted sample bottle (large bottle)
- Hand operated vacuum pump
- Lights on in diluted sample port of LSP
- LSP Sample Cask available with diluted sample bottle piston installed
- Reach Rod for remote valve operation

5.1.2 At the CASP perform the following:

5.1.2.1 Verify ventilation is ON and mode control switches are in NORMAL position.

5.1.2.2 Check High Vacuum Lights indicate NORMAL for the following:

- LSP
- CAP
- CASP

5.1.3 Perform valve lineup per Attachment A, "High Radiation Sample Valve Lineup Sheet."

5.1.4 Connect DI Water flush hose to LSP.

5.1.5 Open DI Water supply valve to LSP.

5.1.6 Evacuate the diluted sample bottle (60 ml, large bottle) to ≥ 15 inches of vacuum. IF possible, THEN ≥ 20 inches of vacuum is recommended.

5.1.6.1 Install sample bottle in sample cask.

5.1.6.2 Check cask for proper operation (large holder in cask).

5.1.7 At the LSP perform the following:

5.1.7.1 Inspect dilution water reservoir level.

5.1.7.2 IF necessary, THEN fill to full mark.

5.1.8 WHEN performing an RCHL sample, THEN request Control Room Operator perform the following:

- Open RC-422.
- Open RC-423.

5.1.9 At the SAP perform the following:

5.1.9.1 WHEN performing an RCHL sample, THEN perform the following:

- Open CC-314.
- Open RC-423-1.

5.1.9.2 WHEN performing a Residual Heat Removal (RHR) sample, THEN perform the following:

- Open CC-316.
- WHEN sampling A RHR, THEN open RHR-81-A.
- WHEN sampling B RHR, THEN open RHR-81-B.

5.1.9.3 Position RC-437-1 to DDT.

5.1.9.4 Position RC-437-2 to DDT.

5.1.10 At the LSP perform the following:

5.1.10.1 Open RC-V3.

5.1.10.2 WHEN performing a RCHL sample, THEN open RC-V-1.2.

5.1.10.3 WHEN performing a RHR sample, THEN open RC-V-1.1.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.1.10.4 Throttle RC-VREL-1 until flow indicator RC-FI-1 indicates 1,900 to 2,000 cc/min.

- WHEN RCHL sample, THEN purge at least 12 minutes.
- WHEN RHR sample, THEN purge at least 25 minutes.

5.1.10.5 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.1.10.6 WHEN purge is complete, THEN perform the following:

a. Close RC-V-3.
b. Open RC-V-8.2.
c. Open RC-V-8.1.
d. Open RC-V-2.

Note

Purge time may be varied based on purge flow rate obtained.

5.1.10.7 Throttle RC-VREL-2 until flow indicator RC-FI-2 indicates 180 to 220 cc/min.

5.1.10.8 Purge at least 3 minutes.

5.1.10.9 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.1.10.10 Verify diluted sample bottle (from Step 5.1.6) vacuum ≥ 15 inches of vacuum. IF possible, THEN ≥ 20 inches of vacuum is recommended.

5.1.10.11 Install the sample cart under the diluted sample port.

5.1.10.12 Position the sample bottle up on the needles.

5.1.10.13 WHEN purge is complete, THEN perform the following:

a. Turn RC-DV-1 to SAMPLE position (6 o'clock).

b. IF RCHL sample, THEN close RC-V-1.2.

c. IF RHR sample, THEN close RC-V-1.1.

5.1.10.14 Throttle open RC-V-21.

5.1.10.15 Add 24 ml of DI Water to the sample bottle.

5.1.10.16 IF less than 24 ml of DI Water is used, THEN note sample volume.

5.1.10.17 Close RC-V-21.

5.1.10.18 Turn RC-DV-1 to BYPASS position (3 o'clock).

5.1.10.19 Open RC-V-4.

Note

Flush time may be varied based on actual flush flow rate obtained.

5.1.10.20 Throttle RC-VEL-2 until flow indicator RC-FI-2 indicates 180 to 200 cc/min.

5.1.10.21 Flush for at least 3 minutes.

5.1.10.22 IF unable to attain desired flush flow rate, THEN adjust flush time accordingly.

Note

The following step may be performed during the flush.

5.1.10.23 Lower the diluted sample bottle into the sample cask.

- Close the cask
- Place cask near fume hood
- Install auxiliary shield

5.1.10.24 Close RC-V-4.

5.1.10.25 Close RC-V-2.

5.1.10.26 Close RC-V-8.2.

5.1.10.27 Close RC-V-8.1.

5.1.11 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Close RC-422.
- Close RC-423.

5.1.12 At the SAP perform the following:

5.1.12.1 WHEN RCHL sample, THEN perform the following:

- Close RC-423-1.
- Close CC-314.

5.1.12.2 WHEN RHR sample, THEN perform the following:

- IF opened, THEN close RHR-81A.
- IF opened, THEN close RHR-81B.
- Close CC-316.

5.1.12.3 Position RC-437-1 to VCT.

5.1.12.4 Position RC-437-2 to VCT.

5.1.12.5 Close DI Water supply valve.

5.1.12.6 Disconnect DI Water hose.

Note

Dilution factor correction is required if sample was not diluted with 24 ml of DI Water Step 5.1.10.16.

5.1.13 Perform the following post sample analyses preparations:

Note

For Boron analysis of < 2,000 ppm, an appropriately larger amount of sample shall be used.

5.1.13.1 WHEN analyzing for boron, THEN perform the following:

a. Transfer a 1.0 ml sample from the sample cask into a VYCOR evaporating dish using the shielded liquid aliquoter.

b. Continue the boron analysis per RCC-082, "Boron Analysis Curcumin Method."

5.1.13.2 WHEN performing a Beta/Gamma analysis, THEN perform the following:

a. Transfer 1.0 ml of coolant from the cask to a 1 liter poly bottle using the shielded liquid aliquoter.

b. Dilute to 1 liter with DI Water.

c. Transfer 10 ml of diluted sample to a second 1 liter poly bottle.

d. Dilute to 1 liter with DI Water. Dilution factor = 10^8.

e. Transfer sample to the multi-channel analyzer for counting.

5.2 Inline Sample for pH, Conductivity, O2 and Chloride

Note

Gas cylinders and their regulators are located outside the HRSR at the gas cylinder rack.

5.2.1 Align argon and helium as follows:

5.2.1.1 Verify open argon gas cylinder isolation.

5.2.1.2 Verify argon cylinder pressure ≥ 400 psi.

5.2.1.3 Adjust argon pressure regulator to obtain 150 psi (140 to 160 psi).

5.2.1.4 Verify open helium gas cylinder isolation.

5.2.1.5 Verify helium cylinder pressure ≥ 400 psi.

5.2.1.6 Adjust helium pressure regulator to obtain 70 psi (65 to 85 psi).

5.2.2 Verify reach rod is available for remote valve operation.

5.2.3 Check HRSR Calibration Log for verification of latest performances.

5.2.4 At the CASP perform the following:

5.2.4.1 Verify ventilation is ON and mode control switches are in NORMAL position.

5.2.4.2 Check High Vacuum Lights indicate NORMAL for the following:

- LSP
- CAP
- CASP

5.2.5 At the CMP perform the following:

5.2.5.1 CMP Main Power switch ON.

5.2.5.2 Verify the YSI chart recorder is ON.

5.2.5.3 Verify the pH meter is ON.

5.2.5.4 Verify the conductivity meter is ON.

5.2.5.5 Start Ion Chromatograph (IC) in accordance with RCC-520, "DX-500 Startup and Shutdown Procedure."

5.2.6 Perform valve lineup per Attachment A, "High Radiation Sample Valve Lineup Sheet."

5.2.7 At the CAP, verify argon, helium, and air regulators set as follows:

5.2.7.1 Adjust argon pressure regulator to obtain 30 psi (30 to 32 psi).

5.2.7.2 Adjust helium pressure regulator to obtain 50 psi (50 to 55 psi).

5.2.7.3 Adjust air pressure regulator to obtain 75 psi (75 to 85 psi).

5.2.8 Connect DI Water flush hoses to LSP and CAP.

5.2.9 Open DI Water supply valve to LSP.

5.2.10 Open DI Water supply valve to CAP.

5.2.11 At the CAP perform the following:

5.2.11.1 Position V-6 to LIQUID SAMPLE (9 o'clock).

5.2.11.2 Position V-5 to LIQUID SAMPLE (9 o'clock).

5.2.12 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Open RC-422.
- Open RC-423.

5.2.13 At the SAP perform the following:

5.2.13.1 WHEN performing an RCHL sample, THEN perform the following:

- Open CC-314.
- Open RC-423-1.

5.2.13.2 WHEN performing a RHR sample, THEN perform the following:

- Open CC-316.
- WHEN sampling A RHR, THEN open RHR-81-A.
- WHEN sampling B RHR, THEN open RHR-81-B.

5.2.13.3 Position RC-437-1 to DDT.

5.2.13.4 Position RC-437-2 to DDT.

5.2.14 At the LSP perform the following:

5.2.14.1 Open RC-V3.

5.2.14.2 WHEN performing a RCHL sample, THEN open RC-V-1.2.

5.2.14.3 WHEN performing a RHR sample, THEN open RC-V-1.1.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.2.14.4 Throttle RC-VREL-1 until flow indicator RC-FI-1 indicates 1,900 to 2,000 cc/min.

- WHEN RCHL sample, THEN purge at least 12 minutes.
- WHEN RHR sample, THEN purge at least 25 minutes.

5.2.14.5 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.2.14.6 WHEN purge is complete, THEN perform the following:

- Close RC-V-3.
- Open RC-V-2.
- Open RC-V-7.
- Position RC-V-22 to CHEM PANEL.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.2.14.7 Throttle RC-VREL-2 until flow indicator RC-FI-2 indicates 180 to 220 cc/min.

5.2.14.8 Purge at least 5 minutes.

5.2.14.9 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.2.15 At the CAP perform the following:

5.2.15.1 Verify adequate flow to the CAP by observing the red lights ON for both Oxygen and IC.

5.2.15.2 WHEN the YSI O_2 meter chart reading has stabilized, THEN record the following on the Reactor Coolant Analysis Log (routine logsheet):

- Conductivity reading
- Temperature
- O_2 reading

5.2.15.3 Inject sample on IC unit.

- WHEN IC run complete, THEN record Chloride value on the Reactor Coolant Analysis Log (routine logsheet) and attach chart recorder printout.

5.2.16 At the LSP perform the following:

5.2.16.1 Turn RC-V-22 to WASTE position (6 o'clock).

5.2.16.2 WHEN RCHL sample, THEN close RC-V-1.2.

5.2.16.3 WHEN RHR sample, THEN close RC-V-1.1.

5.2.16.4 Open RC-V-4.

5.2.16.5 Observe DI Water flush to waste as indicated on Flow Indicator RC-FI-2.

5.2.16.6 Flush for 2 minutes.

5.2.16.7 Record pH reading on the Reactor Coolant Analysis Log (routine logsheet).

5.2.16.8 Turn RC-V-22 to CAP position (12 o'clock).

5.2.16.9 Verify flush water flow by observing the lights ON for both O_2 Flow and IC Flow.

5.2.16.10 Flush for at least 2 minutes.

5.2.16.11 Turn RC-V-22 to WASTE position (6 o'clock).

5.2.16.12 Close RC-V-7.

5.2.16.13 Close RC-V-2.

5.2.16.14 Close RC-V-4.

5.2.17 At the CAP perform the following:

5.2.17.1 Position V-6 to O_2 CAL (6 o'clock).

5.2.17.2 Close V-5 (6 o'clock).

5.2.18 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Close RC-422.
- Close RC-423.

5.2.19 At the SAP perform the following:

5.2.19.1 WHEN RCHL sample, THEN perform the following:

- Close RC-423-1.
- Close CC-314.

5.2.19.2 WHEN RHR sample, THEN perform the following:

- IF opened, THEN close RHR-81A.
- IF opened, THEN close RHR-81B.
- Close CC-316.

5.2.19.3 Position RC-437-1 to VCT.

5.2.19.4 Position RC-437-2 to VCT.

5.2.19.5 Close DI Water supply valve.

5.2.19.6 Disconnect DI Water hose.

5.3 Inline Hydrogen and Gaseous Activity Grab Sample

5.3.1 Verify the multi-channel analyzer available for counting.

Note

Gas cylinders and their regulators are located outside the HRSR at the gas cylinder rack.

5.3.2 Align argon and helium as follows:

5.3.2.1 Verify open argon gas cylinder isolation.

5.3.2.2 Verify argon cylinder pressure ≥ 400 psi.

5.3.2.3 Adjust argon pressure regulator to obtain 150 psi (140 to 160 psi).

5.3.2.4 Verify open helium gas cylinder isolation.

5.3.2.5 Verify helium cylinder pressure ≥ 400 psi.

5.3.2.6 Adjust helium pressure regulator to obtain 70 psi (65 to 85 psi).

5.3.3 At the CASP perform the following:

5.3.3.1 Verify ventilation is ON and mode control switches are in NORMAL position.

5.3.3.2 Check High Vacuum Lights indicate NORMAL for the following:

- LSP
- CAP
- CASP

5.3.4 Verify the following equipment available and operational:

- Reach Rod for remote valve operation
- 10 cc gas sample bottle, with septum, properly installed in face of LSP using the special handling tool

5.3.5 At the CMP perform the following:

5.3.5.1 CMP Main Power switch ON.

5.3.5.2 Verify the program in Gas Chromatograph (GC) mini-computer.

5.3.5.3 Check HRSR Calibration Log for verification of latest performances.

5.3.6 Perform valve lineup per Attachment A, "High Radiation Sample Valve Lineup Sheet."

5.3.7 At the CAP, verify Argon, Helium, and Air regulators set as follows:

5.3.7.1 Adjust Argon pressure regulator to obtain 30 psi (30 to 32 psi).

5.3.7.2 Adjust Helium pressure regulator to obtain 50 psi (50 to 55 psi).

5.3.7.3 Adjust Air pressure regulator to obtain 75 psi (75 to 85 psi).

5.3.8 Connect DI Water flush hoses to LSP and CAP.

5.3.9 Open DI Water supply valves.

5.3.10 At the LSP, dry the expansion vessel as follows:

5.3.10.1 Turn RC-V-11 to ARGON position (3 o'clock).

5.3.10.2 Open RC-V-9.

5.3.10.3 Open RC-V-8.2.

5.3.10.4 Open RC-V-10.

5.3.10.5 Regulate RC-VREL-2 to obtain 20 psi on RC-G-3.

5.3.10.6 Observe flow indication on RC-FI-2.

5.3.10.7 Wait at least 1 minute.

5.3.10.8 Turn RC-V-11 counterclockwise to VACUUM/SAMPLE position (9 o'clock).

5.3.10.9 Close RC-V-9.

5.3.10.10 Close RC-V-8.2.

5.3.11 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Open RC-422.
- Open RC-423.

5.3.12 At the SAP perform the following:

5.3.12.1 WHEN performing an RCHL sample, THEN perform the following:

- Open CC-314.
- Open RC-423-1.

5.3.12.2 WHEN performing a RHR sample, THEN perform the following:

- Open CC-316.
- WHEN sampling A RHR, THEN open RHR-81-A.
- WHEN sampling B RHR, THEN open RHR-81-B.

5.3.12.3 Position RC-437-1 to DDT.

5.3.12.4 Position RC-437-2 to DDT.

5.3.13 At the LSP perform the following:

5.3.13.1 Open RC-V3.

5.3.13.2 WHEN performing a RCHL sample, THEN open RC-V-1.2.

5.3.13.3 WHEN performing a RHR sample, THEN open RC-V-1.1.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.3.13.4 Throttle RC-VREL-1 until flow indicator RC-FI-1 indicates 1,900 to 2,000 cc/min.

- WHEN RCHL sample, THEN purge at least 12 minutes.
- WHEN RHR sample, THEN purge at least 25 minutes.

5.3.13.5 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

Note

The following, Steps 5.3.13.6 to 5.3.13.11, may be completed while waiting for the sample purge to be completed.

5.3.13.6 Evacuate the Gas Expansion Vessel, sample bottle, and tubing as follows:

a. Open RC-V-13.

b. Open RC-V-15.

c. Turn RC-DV-2 to GAS SAMPLE position (12 o'clock).

d. Open RC-V-12.

5.3.13.7 WHEN vacuum on RC-G-2.2 ≥ 22 inches vacuum, THEN turn RC-DV-2 to TO GC position (3 o'clock).

5.3.13.8 WHEN vacuum on RC-G-2.1 ≥ 22 inches of vacuum, THEN perform the following:

a. Close RC-V-15.

b. Close RC-V-13.

c. Close RC-V-10.

d. Turn RC-V-11 clockwise to CLOSE position (12 o'clock).

e. Close RC-V-12.

5.3.13.9 Observe vacuum is holding steady on both gauges by performing the following:

a. Turn RC-DV-2 to 12 o'clock.

b. Observe vacuum on RC-G-2.2 is holding steady.

c. Turn RC-DV-2 to 3 o'clock.

5.3.13.10 Open RC-V-14.

5.3.13.11 Observe RC-G-2.2 about 1.0 psi.

Note

Sample purge must be completed before proceeding.

5.3.13.12 Close RC-V-3.

5.3.13.13 Open RC-V-8.2.

5.3.13.14 Open RC-V-8.1.

5.3.13.15 Open RC-V-2.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.3.13.16 Throttle RC-VREL-2 until flow indicator RC-FI-2 indicates 180 to 220 cc/min.

5.3.13.17 Purge at least 3 minutes.

5.3.13.18 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.3.13.19 Close RC-V-8.2.

5.3.13.20 Close RC-V-8.1.

5.3.13.21 WHEN RCHL sample, THEN close RC-V-1.2.

5.3.13.22 WHEN RHR sample, THEN close RC-V-1.1.

5.3.13.23 Open RC-V-9.

5.3.13.24 Open RC-V-16.

5.3.13.25 Wait 1 minute.

5.3.13.26 Close RC-V-16.

5.3.13.27 Close RC-V-9.

5.3.13.28 WHEN gas stripping complete, THEN flush the LSP as follows:

a. Open RC-V-8.2.

b. Open RC-V-8.1.

c. Open RC-V-4.

d. Turn RC-V-11 counterclockwise to VACUUM/SAMPLE position (9 o'clock).

5.3.13.29 Turn RC-DV-2 to GAS SAMPLE position (12 o'clock). To obtain the diluted gas sample.

5.3.13.30 Observe pressure gauge RC-G-2.2 stabilized at about 1 psi.

5.3.13.31 Turn RC-DV-2 to TO GC position (3 o'clock).

5.3.13.32 Close RC-V-14.

5.3.13.33 Remove the diluted gas sample bottle from the LSP.

5.3.14 Place entire assembly in fume hood for later transport to multi-channel analyzer.

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

5.3.16 At the LSP, open RC-V-15 and allow the gas sample to transfer to the GC.

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

- Cycle through the four loops.
- Stop at each loop at least 1 minute.

Note

Start attenuation selection with high values.

- Determine hydrogen concentration using selective attenuation.
- Record information on the Reactor Coolant Analysis Log (routine logsheet).

5.3.18 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Close RC-422.
- Close RC-423.

5.3.19 At the LSP perform the following:

5.3.19.1 Close RC-V-4.

5.3.19.2 Close RC-V-2.

5.3.19.3 Close RC-V-8.1.

5.3.19.4 Close RC-V-8.2.

5.3.20 At the SAP perform the following:

5.3.20.1 WHEN RCHL sample, THEN perform the following:

- Close RC-423-1.
- Close CC-314.

5.3.20.2 WHEN RHR sample, THEN perform the following:

- IF opened, THEN Close RHR-81A.
- IF opened, THEN close RHR-81B.
- Close CC-316.

5.3.20.3 Position RC-437-1 to VCT.

5.3.20.4 Position RC-437-2 to VCT.

5.3.21 At the LSP to flush the expansion vessel perform the following:

5.3.21.1 Open RC-V-8.2.

5.3.21.2 Open RC-V-9.

5.3.21.3 Turn RC-V-11 to DI WATER position (6 o'clock).

5.3.21.4 Flush for at least 2 minutes.

5.3.21.5 Turn RC-V-11 to ARGON position (3 o'clock).

5.3.21.6 Wait 2 minutes.

5.3.21.7 Turn RC-V-11 counterclockwise to CLOSE position (12 o'clock).

5.3.21.8 Close RC-V-9.

5.3.21.9 Close RC-V-8.2.

5.3.22 To remove radioactive gases from the system perform the following:

5.3.22.1 Open RC-V-10.

5.3.22.2 Open RC-V-13.

5.3.22.3 Open RC-V-15.

5.3.22.4 Turn RC-V-11 to VACUUM/SAMPLE position (9 o'clock).

5.3.22.5 Open RC-V-12.

5.3.22.6 Evacuate system for at least 1 minute.

5.3.22.7 Close RC-V-12.

5.3.22.8 Turn RC-V-11 clockwise to CLOSE position (12 o'clock).

5.3.22.9 Close RC-V-15.

5.3.22.10 Close RC-V-13.

5.3.22.11 Close RC-V-10.

5.3.23 Transport diluted gas bottle to multi-channel analyzer for analysis in accordance with RCC-063, RCS Gaseous Activity."

5.4 Undiluted Liquid Grab Sample

5.4.1 In the HRSR check the following equipment available and operational:

- Sample cask available with undiluted piston installed
- Two - 15 ml undiluted sample bottle
- New undiluted liquid flush bottle
- Undiluted liquid sample flush bottle handling tool
- Lights ON in undiluted sample port of LSP
- Reach Rod for remote valve operation

5.4.2 At the CASP perform the following:

5.4.2.1 Verify ventilation is ON and mode control switches are in NORMAL position.

5.4.2.2 Check High Vacuum Lights indicate NORMAL for the following:

- LSP
- CAP
- CASP

5.4.3 Perform valve lineup per Attachment A, "High Radiation Sample Valve Lineup Sheet."

5.4.4 Connect DI Water flush hoses to LSP.

5.4.5 Open DI Water supply valve to LSP.

5.4.6 Install undiluted sample bottle in sample cask.

5.4.7 Check cask for proper operation.

5.4.8 Install the sample cask under the undiluted sample port.

5.4.9 Position the undiluted sample bottle up on the needles.

5.4.10 WHEN performing an RCHL sample, THEN request Control Room Operator:

- Open RC-422.
- Open RC-423.

5.4.11 At the SAP perform the following:

5.4.11.1 WHEN performing an RCHL sample, THEN perform the following:

- Open CC-314.
- Open RC-423-1.

5.4.11.2 WHEN performing a RHR sample, THEN perform the following:

- Open CC-316.
- WHEN sampling A RHR, THEN open RHR-81-A.
- WHEN sampling B RHR, THEN open RHR-81-B.

5.4.11.3 Position RC-437-1 to DDT.

5.4.11.4 Position RC-437-2 to DDT.

5.4.12 At the LSP perform the following:

5.4.12.1 Open RC-V-3.

5.4.12.2 WHEN performing a RCHL sample, THEN open RC-V-1.2.

5.4.12.3 WHEN performing a RHR sample, THEN open RC-V-1.1.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.4.12.4 Throttle RC-VREL-1 until flow indicator RC-FI-1 indicates 1,900 to 2,000 cc/min.

- WHEN RCHL sample, THEN purge at least 12 minutes.
- WHEN RHR sample, THEN purge at least 25 minutes

5.4.12.5 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.4.12.6 WHEN purge is complete, THEN perform the following:

a. Close RC-V-3.

b. Open RC-V-2.

c. Open RC-V-7.

Note

Purge time may be varied based on actual purge flow rate obtained.

5.4.12.7 Throttle RC-VREL-2 until flow indicator RC-FI-2 indicates 180 to 220 cc/min.

5.4.12.8 Purge for at least 3 minutes.

5.4.12.9 IF unable to attain desired purge flow rate, THEN adjust purge time accordingly.

5.4.12.10 Turn RC-V-19 to SAMPLE position (3 o'clock).

5.4.12.11 Observe flow into undiluted sample bottle.

5.4.12.12 WHEN undiluted sample bottle is full, THEN position RC-V-19 to BYPASS position (12 o'clock).

5.4.13 Remove undiluted sample bottle from the needles.

5.4.14 Store the undiluted sample.

- Return undiluted sample to cask.
- Close lead top.
- Install auxiliary shield.
- Remove cask from HRSR.

5.4.15 IF RCHL sample, THEN close RC-V-1.2.

5.4.16 IF RHR sample, THEN close RC-V-1.1.

5.4.17 Open RC-V-4.

5.4.18 Place new undiluted sample bottle in special handling tool.

5.4.19 Position tool and bottle up on undiluted sample needles in LSP.

5.4.20 Turn RC-V-19 to SAMPLE position (3 o'clock).

5.4.21 Flush for at least 3 minutes.

5.4.22 Turn RC-V-19 to BYPASS position (12 o'clock).

5.4.23 Close RC-V-7.

5.4.24 Close RC-V-2.

5.4.25 Close RC-V-4.

5.4.26 Remove undiluted flush bottle and handling tool.

5.4.27 WHEN RCHL sample, THEN request Control Room Operator perform the following:

- Close RC-422.
- Close RC-423.

5.4.28 At the SAP perform the following:

5.4.28.1 WHEN RCHL sample, THEN perform the following:

- Close RC-423-1.
- Close CC-314.

5.4.28.2 WHEN RHR sample, THEN perform the following:

- IF opened, THEN Close RHR-81A.
- IF opened, THEN close RHR-81B.
- Close CC-316.

5.4.28.3 Position RC-437-1 to VCT.

5.4.28.4 Position RC-437-2 to VCT.

5.4.29 WHEN off-site shipment of an undiluted sample is required, THEN contact a Chemistry Supervisor.

5.5 Containment Hydrogen (H2) Monitor 1A & 1B Operation Procedure

5.5.1 WHEN sampling the Containment for hydrogen, THEN perform the following:

5.5.1.1 At the CASP perform the following:

5.5.1.1.1 Verify ventilation is ON and mode control switches are in NORMAL position.

5.5.1.1.2 Check High Vacuum Lights indicate NORMAL for the following:

- LSP
- CAP
- CASP

5.5.1.2 Verify remote panels are in standby and have had 6 hours warm-up time.

5.5.1.3 Verify heat tracing is energized and operational.

Note

Due to ALARA considerations, both containment air sample trains will be lined up to preclude additional valve lineups.

5.5.1.4 Contact the Control Room and perform the following:

5.5.1.4.1 Verify that Containment Dome Fans 1A and 1B are operating.

5.5.1.4.2 Inform the Control Room that both containment air sample trains will be lined up for sampling.

5.5.1.4.3 Request the Control Room perform the following valve lineup:

- Close SA 7010A.
- Open LOCA 2A.
- Open LOCA 10A.
- Open SA 7003A.

- Close SA 7010B.
- Position LOCA 2B LOCAL/REMOTE to LOCAL.
- Open LOCA 2B.
- Open LOCA 10B.
- Position SA 7003B LOCAL/REMOTE to LOCAL.
- Open SA 7003B.

Note

Damage to the Hydrogen Analyzer will result if CASP is monitoring the same Train.

5.5.1.5 WHEN H_2 Monitor 1A is to be used, THEN open AS-110A.

5.5.1.6 WHEN H_2 Monitor 1B is to be used, THEN open AS-110B.

5.5.1.7 Inform the Control Room that the H_2 Monitors are going to be started so that they can monitor their indication.

5.5.1.8 Switch selected analyzer to ANALYZE.

5.5.1.9 Switch selected analyzer to SAMPLE MODE.

5.5.1.10 Push the remote selector pushbutton to gain control at the remote panel.

5.5.1.11 Allow at least 10 minutes for sample purge time.

Note

The Containment Hydrogen Monitors read out remotely in the Control Room.

5.5.1.12 IF desired, THEN record Hydrogen Monitor indication on the Reactor Coolant Analysis Log (routine logsheet).

5.5.2 WHEN all Containment hydrogen sampling is complete, THEN perform the following:

5.5.2.1 Switch selected H_2 Monitor to STANDBY.

5.5.2.2 WHEN H_2 Monitor 1A was used, THEN close AS-110A.

5.5.2.3 WHEN H_2 Monitor 1B was used, THEN close AS-110B.

5.5.2.4 Request the Control Room perform the following valve lineup:

- Close LOCA 2A.
- Close LOCA 10A.
- Close SA 7003A.
- Open SA 7010A.

- Close LOCA 2B.
- Position LOCA 2B LOCAL/REMOTE to REMOTE.
- Close LOCA 10B.
- Close SA 7003B.
- Open SA 7010B.
- Position SA 7010B LOCAL/REMOTE to REMOTE.

5.6 Flush of Liquid Sample Lines

Note

The purpose of this section is to reduce radiation levels behind the liquid sample panel during post accident conditions.

5.6.1 At the SAP perform the following:

5.6.1.1 Position RC-437-1 to DDT.

5.6.1.2 Position RC-437-2 to DDT.

5.6.1.3 Open FPC-51.

5.6.1.4 WHEN performing an RCHL flush, THEN perform the following:

- Open FPC-51-14.
- Open CC-314.
- Open RC-423-1.

5.6.1.5 WHEN performing a RHR flush, THEN perform the following:

- Open FPC-51-41.
- Open CC-316.

5.6.2 At the LSP perform the following:

5.6.2.1 WHEN performing a RCHL flush, THEN open RC-V-1.2.

5.6.2.2 WHEN performing a RHR flush, THEN open RC-V-1.1.

5.6.2.3 Open RC-V-2.

5.6.2.4 Open RC-V-7.

Note

Flush time may be varied based on actual flush flow rate obtained.

5.6.2.5 Throttle RC-VREL-2 until flow indicator RC-FI-2 indicates 180 to 220 cc/min.

5.6.2.6 Flush at least 45 minutes.

5.6.2.7 IF unable to attain desired flush flow rate, THEN adjust flush time accordingly.

5.6.3 At the SAP perform the following:

5.6.3.1 Close FPC-51.

5.6.3.2 WHEN RCHL line flush, THEN perform the following:

a. Close FPC-51-14.

b. Close RC-423-1.

c. Close CC-314.

5.6.3.3 WHEN RHR line flush, THEN perform the following:

a. Close FCP-51-41.

b. Close CC-316.

c. Close RC-V-1.1.

5.6.4 At the LSP perform the following:

5.6.4.1 WHEN RCHL line flush, THEN close RC-V-1.2.

5.6.4.2 WHEN RHR line flush, THEN close RC-V-1.1.

5.6.4.3 Close RC-V-2.

5.6.4.4 Close RC-V-7.

5.6.4.5 Close RC-VREL-2, then open RC-VREL-2 approximately ½ turn.

5.6.4.6 Continue flush by opening RC-V-4.

5.6.4.7 Open RC-V-3.

5.6.4.8 Throttle RC-VREL-1 until positive indication of flow on RC-FI-1.

Note

Additional time may be required if radiation levels behind LSP have NOT stabilized.

5.6.4.9 Flush at least 15 minutes.

5.6.4.10 Close RC-V-3.

5.6.4.11 Close RC-V-4.

5.6.4.12 Close RC-VREL-1, then open RC-VREL-1 approximately ½ turn.

6.0 Final Conditions

6.1 Plant Emergency has been Terminated or Recovery actions have begun and the Emergency Response Manager has suspended the use of EPIPs.

7.0 References

7.1 Sentry HRSS Operating and Maintenance Manual

7.2 RCC-063, RCS Gaseous Activity

7.3 RCC-082, Boron Analysis Curcumin Method

7.4 RCC-201, HRSR Conductivity, YSI Dissolved Oxygen, and pH Analysis

7.5 RCC-202, Hydrogen - Gas Chromatography (G.C.) Analysis

7.6 RCC-203, HRSR Post Accident Chloride-Ion Chromatography (IC) Analysis

7.7 RCC-520, DX-500 Startup and Shutdown Procedure

7.8 Commitment PLS-84-022 RQMT 2 - Step 5.3.14 (NOTE)

7.9 Commitment TEC-84-005, Step 5.1.13 and 5.1.14

7.10 EPIP-AD-11, Emergency Radiation Controls

7.11 OEA 93-160

7.12 KAP 1136, Corrective Action 2

8.0 Records

8.1 The following QA records and non-QA records are identified in this directive/procedure and are listed on the KNPP Records Retention Schedule. These records shall be maintained according to the KNPP Records Management Program.

8.1.1 QA Records

None

8.1.2 Non-QA Records

None

HIGH RADIATION SAMPLE VALVE LINEUP SHEET

Note

Valves are listed as they appear on the panel, beginning in the top left hand corner working left to right and top to bottom.

SAMPLE ACQUISITION PANEL

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

HIGH RADIATION SAMPLE VALVE LINEUP SHEET

Note

Valves are listed as they appear on the panel, beginning in the top left hand corner working left to right and top to bottom.

LIQUID SAMPLE PANEL

RC-V-12	Argon to Eductor	Closed	
RC-V-15	Gas Smpl to GC	Closed	
RC-V-14	Argon Purge to Dil Gas Smpl	Closed	
RC-V-13	Dil Gas Smpl Vac	Closed	
RC-V-10	Expansion Vessel Vacuum	Closed	
RC-DV-2	Diluted Gas Smpl	TO GC	(3 o'clock)
RC-V-11	Expansion Vessel Outlet	CLOSED	(12 o'clock)
RC-V-REL-1	RC Purge Throttle	Throttled	
RC-V-REL-2	RC Purge to Waste Tk	Throttled	
RC-V-3	RC Purge Stop	Closed	
RC-V-7	Smpl Bomb Bypass	Closed	
RC-V-8.2	Press Smpl Bomb Outlet	Closed	
RC-V-9	Expansion Vessel Inlet	Closed	
RC-V-17	Glove Box Grab Sample	Closed	
RC-V-2	RC Purge to Waste Stop	Closed	
RC-V-18	RC Purge/Backflush	PURGE	(6 o'clock)
RC-V-22	RC Purge Waste/CAP	WASTE	(6 o'clock)
RC-V-6.2	Rem Smpl Bomb Outlet	Closed	
RC-V-5.2	Rem Smpl Bomb Outlet Iso	Closed	
RC-V-19	Undiluted Liq Smpl	BYPASS	(12 o'clock)
RC-DV-1	Diluted Liquid Sample	BYPASS	(3 o'clock)
RC-V-1.1	RHR Smpl Iso	Closed	

HIGH RADIATION SAMPLE VALVE LINEUP SHEET

Note

Valves are listed as they appear on the panel, beginning in the top left hand corner working left to right and top to bottom.

LIQUID SAMPLE PANEL (continued)

RC-V-1.2	RCHL/Pzr Smpl Iso	Closed
RC-V-1.3	(Spare)	Closed
RC-V-1.4	(Spare)	Closed
RC-V-1.5	VCT Gas Sp Smpl Iso	Closed
RC-V-21	Dilution H_2O to Diluted Sample	Closed
RC-V-8.1	Press Smpl Bomb Inlet	Closed
RC-V-16	Argon Gas Strip Purge	Closed
RC-V-4	DI Water Flush Iso	Closed
RC-V-6.1	Rem Smpl Bomb Inlet	Closed
RC-V-5.1	Rem Smpl Bomb Inlet Iso	Closed

LIQUID SAMPLE PANEL (Demin Section)

DM-V-1.1	CVCS M/B Inlet	Closed
DM-V-1.2	CVCS M/B Outlet	Closed
DM-V-1.3	(Spare)	Closed
DM-V-3	DI Water Flush	Closed
RW-V-6	Radwaste	Closed
DM-V-2.1	CVCS Demin Inlet Smpl	Closed
DM-V-2.2	CVCS Demin Outlet Smpl	Closed
DM-V-2.3	(Spare)	Closed

HIGH RADIATION SAMPLE VALVE LINEUP SHEET

Note

Valves are listed as they appear on the panel, beginning in the top left hand corner working left to right and top to bottom.

CHEMICAL ANALYTICAL PANEL

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

VALVE LINEUP SHEET

CASP CONTROL PANEL

AV-1/SV-1.2	Smpl Pos #1 Inlet/Outlet	Closed
SV-2.1/SV-2.2	Smpl Pos #2 Inlet/Outlet	Closed
SV-3.1/SV-3.2	Smpl Pos #3 Inlet/Outlet	Closed
SV-4.1/SV-4.2	Smpl Pos #4 Inlet/Outlet	Closed
SV-5	Smpl Bypass	Closed
SV-10	Air to Eductor	Closed
AV-2	Return to Containment	Closed
SV-6	Eductor Suction Iso	Closed
	(At Sample Acquisition Panel)	
AS110A	Cont Air Smpl A Iso	Closed
AS110B	Cont Air Smpl B Iso	Closed

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

I.M.C.C. CONTROL PANEL

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	Degasifier 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 CORP. Kewaunee Nuclear Power Plant *Emergency Plan Implementing Procedure*	No. EPIP-RET-03D	Rev. N
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Reviewed By [signature]	Approved By [signature]	

Nuclear Safety Related	☑ Yes ☐ No	PORC Review Required	☑ Yes ☐ No	SRO Approval Of Temporary Changes Required	☑ Yes ☐ No

1.0 Purpose

1.1 This procedure provides instruction for drawing and analyzing containment samples when directed by the Radiological Protection Director (RPD).

2.0 General Notes

2.1 This procedure is designated CONTINUOUS USE.

2.2 This procedure is to detail the requirements, considerations, and operations of the Containment Air Sample Panel (CASP) during a Post LOCA condition, to obtain a grab sample of Containment air for Gross Gas, Iodine, Hydrogen, and Oxygen analyses.

3.0 Precautions and Limitations

3.1 Process an Emergency Radiation Work Permit as needed per EPIP-AD-11, "Emergency Radiation Controls."

3.2 Contact the Radiation Protection (HP) Group and obtain the following:

- Proper personnel dosimetry
- Proper radiation detection instrumentation
- Personnel for continuous HP coverage during sampling
- Remote area monitor readings in area of High Radiation Sample Room (HRSR)

3.3 Utilize on-site communications with the RPD as necessary during sampling.

3.4 Any sample drawn from the post accident containment atmosphere should be assumed to contain specific activity of the following magnitude:

- Gas 5.0 Millicuries/cc
- Iodine 0.2 Millicuries/cc

4.0 Initial Conditions

4.1 The site has declared an **Alert, Site Emergency, General Emergency**, or the Shift Manager or Emergency Director has implemented the use of this procedure.

5.0 Procedure

5.1 Obtain all necessary equipment prior to beginning to sample the Containment atmosphere. This equipment includes:

- Operable CASP System with Inline Sample Chamber (ISC) Cart in Sample Station #1
- 5.0 microliter gas syringe (2)
- 1.0 cc gas syringe or equivalent (2)
- 2.0 cc gas syringe or equivalent (1)
- An iodine cartridge holder (1)
- Silver Zeolite Cartridge (1)
- Several small rubber stoppers (3 to 5)
- Portable shields for transporting syringes
- Marinelli beaker (give to HP to be counted prior to sample injection)
- Specially adapted 1 liter poly-bottle (for Gross Gas analysis)

5.2 WHEN preparing for CASP operation, THEN perform the following:

5.2.1 Proceed to HRSR per HP/RPD recommendations.

5.2.2 Determine radiation levels in HRSR and in maintenance area behind panels, if access is required.

5.2.3 Verify that heat tracing is ON.

5.2.4 Verify ventilation is ON and in NORMAL position and high vacuum lights indicate NORMAL for the Liquid Sample Panel (LSP), Chemical Analysis Panel (CAP), and CASP.

5.2.5 Verify that instrument air supply is available at $\geq$ 70 psi.

5.2.6 Verify that CASP and CASP control panels are energized and operational.

5.2.7 Verify valve lineup per Attachment A, "Containment Air Sample Valve Lineup Sheet."

Note

The sample cart may be checked to verify it is properly locked in place by carefully pulling.

5.2.8 Verify the ISC in the #1 position is locked in place.

Note

Only Sample Station 1 shall be used for Iodine Analysis.

Due to ALARA considerations, if available, both containment air sample trains should be aligned.

5.2.9 Contact the Control Room and verify Dome Fans 1A and 1B are operational.

5.2.10 Request Operations perform the following valve lineup at the Post-LOCA Hydrogen Control Panel:

- Open LOCA 2A.
- Open LOCA 10A.
- Open SA 7003A.
- Position LOCA 2B (Local/Remote) to LOCAL.
- Position SA 7003B (Local/Remote) to LOCAL.
- Open LOCA 2B.
- Open LOCA 10B.
- Open SA 7003B.

5.2.11 Verify that one of the following conditions are in effect AND select a Sample Loop (A or B):

a. The hydrogen monitor is NOT in operation, OR

b. The sample loop selected is opposite that being used by H_2 monitor.

5.2.12 WHEN using Containment Air Sample Train 1A, THEN open AS110A.

5.2.13 WHEN using Containment Air Sample Train 1B, THEN open AS110B.

5.2.14 Open SV-10.

5.2.15 Open SV-6.

5.2.16 Open SV-5.

5.2.17 Verify flow monitor on CASP is indicating flow.

5.2.18 Wait at least 2 minutes.

5.2.19 Open AV-1/SV 1.2.

5.2.20 Close SV-5.

5.2.21 Open AV-2.

5.2.22 Wait at least 3 minutes.

5.2.23 Align the ISC Cart as follows:

5.2.23.1 Open V-4, Cart Inlet Valve.

5.2.23.2 Open V-6, Outlet Valve.

5.2.23.3 Close V-5, Bypass Valve.

5.2.23.4 Verify CASP flow monitor is indicating flow.

5.3 WHEN collecting a Containment Air sample, THEN perform the following:

5.3.1 Close SV-6.

5.3.2 Verify flow monitor on CASP indicates NO flow.

Note

An appropriate period for flow monitor pressure equalization is one minute.

5.3.3 Allow the flow monitor to equalize pressure for at least 1 minute.

5.3.4 WHEN pressure equalization period is complete, THEN obtain Containment atmosphere samples as follows:

5.3.4.1 Draw the following samples from the ISC.

a. Two 5 microliter samples

b. IF using the Baseline 1010A Gas Chromatograph, THEN obtain 2 - 1.0 cc syringe samples.

c. IF using the SRI 8610 Gas Chromatograph, THEN obtain 1 - 2.0 cc syringe sample.

5.3.4.2 IF the radiological condition of the syringes are NOT satisfactory, THEN perform the following:

5.3.4.2.1 Lock the tips.

5.3.4.2.2 Insert the needle of each syringe in a rubber stopper to prevent damage.

5.3.4.2.3 Place the syringes in a portable shield for transport.

5.3.5 Use the predetermined route to minimize personnel exposure while transporting the shielded syringes or samples for analysis.

5.4 WHEN shutting down and cleaning out the system, THEN perform the following:

5.4.1 Close AS110A OR AS110B, as appropriate.

5.4.2 Open SV-6 and evacuate the ISC cart.

5.4.3 Wait at least 2 minutes.

5.4.4 Close V-4, Cart Inlet Valve.

5.4.5 Close V-6, Outlet Valve.

5.4.6 Open V-5, Bypass Valve .

5.4.7 Open AS110A OR AS110B, as appropriate.

5.4.8 Close AV-2.

5.4.9 Verify flow monitor has flow.

5.4.10 Wait at least 2 minutes.

5.4.11 Open SV-5.

5.4.12 Close AV-1/SV1.2.

5.4.13 Verify flow monitor has flow.

5.4.14 Wait at least 1 minute.

5.4.15 Close SV-10.

5.4.16 Close SV-6.

5.4.17 Close SV-5.

5.4.18 Close AS110A OR AS110B, as appropriate.

5.4.19 Reset "Active/Inactive" indicator lights to INACTIVE.

5.5 WHEN analyzing a sample for Iodine, THEN perform the following:

5.5.1 Place a Silver Zeolite sample cartridge in a holder.

5.5.2 Attach a hose from the holder to a vacuum source in the HRSR Fume Hood.

5.5.3 Establish air flow through the filter cartridge.

5.5.4 Inject a 5.0 microliter gas sample upstream of the filter cartridge allowing the gas to flow through the Silver Zeolite cartridge.

5.5.5 Remove the Silver Zeolite cartridge from its holder and monitor it for radiation.

5.5.6 Transfer the Silver Zeolite cartridge to the Radiation Protection Group for counting.

Note

Point Beach Nuclear Plant uses an identical geometry as Kewaunee for counting iodine samples.

5.5.7 IF the Count Room is NOT accessible OR the Multi-Channel Analyzer (MCA) is NOT operable, THEN the cartridge may be sent to Point Beach Nuclear Plant for analysis.

Note

Further dilution may be necessary for counting.

5.6 WHEN analyzing a sample for Gross Gas activity, THEN perform the following:

5.6.1 WHEN the Count Room is habitable AND the MCA is operable, THEN perform the following:

5.6.1.1 Inject a 5 microliter gas sample into a marinelli beaker that has been cleared for use by the Radiation Protection Group.

5.6.1.2 Return the sample to the Radiation Protection Group for counting.

5.6.2 IF the Count Room is NOT habitable OR the MCA is NOT operable, THEN perform the following:

5.6.2.1 Inject a 5 microliter gas sample into the specially adapted 1.0 liter poly bottle.

5.6.2.2 Request Radiation Protection Group transfer the sample container to Point Beach Nuclear Plant for Gross Gas activity determination.

5.7 WHEN analyzing a sample for Hydrogen and Oxygen, THEN perform the following:

5.7.1 Based on the gas chromatograph to be used, refer to the appropriate chemistry procedure for operating instructions as follows:

• Baseline 1010A Gas Chromatograph	RCC-080, "Gas Chromatograph, Baseline 1010A Operation Using a Chart Recorder"
	RCC-080D, "Operation of the Baseline 1010A Gas Chromatograph Using Computer Software"
• SRI 8610 Gas Chromatograph	RCC-080C, "Operation of the SRI 8610 Gas Chromatograph"

5.7.2 Verify that the gas chromatograph is:

- Turned on
- Operating properly
- Correctly calibrated

5.7.3 WHEN the gas chromatograph is verified operable, THEN perform the following:

5.7.3.1 WHEN injecting the sample into the Baseline 1010A gas chromatograph, THEN inject the 1.0 cc gas sample into the gas partitioner and await results.

5.7.3.2 WHEN injecting the sample into the SRI 8610 gas chromatograph, THEN inject the 2 cc gas sample into the gas partitioner and await results.

5.7.4 Report all results obtained to the RPD.

5.8 WHEN the Containment Air sampling lineup is to be secured, THEN request Operations perform the following at the Post-LOCA Hydrogen Control Panel:

- Close LOCA 2A.
- Close LOCA 10A.
- Close SA 7003A.
- Close LOCA 2B.
- Close LOCA 10B.
- Close SA 7003B.
- Position LOCA 2B (Local/Remote) to REMOTE.
- Position SA 7003B (Local/Remote) to REMOTE.

6.0 Final Conditions

6.1 This procedure is closed out when the Plant Emergency has been Terminated or Recovery actions have begun and the Emergency Response Manager has suspended the use of EPIPs.

7.0 References

7.1 Sentry HRSS Operating and Maintenance Manual

7.2 EPIP-AD-11, Emergency Radiation Controls

7.3 RCC-080, Gas Chromatograph, Baseline 1010A Operation Using a Chart Recorder

7.4 RCC-080C, Operation of the SRI 8610 Gas Chromatograph

7.5 RCC-080D, Operation of the Baseline 1010A Gas Chromatograph Using Computer Software

7.6 TS 6.11.b.2

8.0 Records

8.1 The following QA records and non-QA records are identified in this directive/procedure and are listed on the KNPP Records Retention Schedule. These records shall be maintained according to the KNPP Records Management Program.

8.1.1 QA Records

None

8.1.2 Non-QA Records

None

CONTAINMENT AIR SAMPLE VALVE LINEUP SHEET

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	Instr. Air to Eductor	Close
AV-2	Return to Containment	Close
SV-6	Eductor Suction Isol	Close

SAMPLE ACQUISITION PANEL

AS110A	Cont Air Smpl A Isol	Close
AS110B	Cont Air Smpl B Isol	Close

INLINE SAMPLE CHAMBER (SF1)

V-4	Sample Inlet Valve	Close
V-5	Sample Bypass Valve	Open
V-6	Sample Outlet Valve	Close