PROC. NO.	TITLE	REV.	REV DATE	DISKETT
LZP 1330-24	DETERMINATION OF REACTOR COOLANT HYDROGEN CONCENTRATION AT THE HIGH RADIATION SAMPLING SYSTEM	00	10/81	03
LZP 1330-25	SAMPLING OF REACTOR COOLANT AT THE HIGH RADIATION SAMPLE SYSTEM	01	3/82	03
LZP 1330-26	SAMPLING OF CONTAINMENT AIR AT THE HIGH RADIATION SAMPLING SYSTEM	01	3/82	03
LZP 1330-27	SAMPLING OF REACTOR COOLANT OFF-GAS AT THE HIGH RADIATION SAMPLE SYSTEM	01	3/82	03
LZP 1330-28	SAMPLING OF PROCESS WATERS CONTAINING RADIO-ACTIVITY AT THE HIGH RADIATION SAMPLING SYSTEM	01	3/82	03
LZP 1330-29	SAMPLING AT THE HIGH RADIATION SAMPLING SYSTEM (VALVE OPERATION AT THE VALVE CONTROL PANEL)	00	0/00	03
LZP 1330-30	TRANSFER OF WASTE FROM THE HRSS WASTE TANK AND WASTE PUMP	00	11/81	03
LZP 1330-31 & 50	See next page			
LZP 1340-1	IMPLEMENTING PROCEDURE FOR FIRE: FIRE MARSHALL	01	9/81	02
LZP 1340-2	IMPLEMENTING PROCEDURE FOR FIRE: FIRE CHIEF (DESIGNATED SHIFT FOREMAN)	01	9/81	02
LZP 1340-3	IMPLEMENTING PROCEDURE FOR FIRE: FIRE OFFICER #1 (COGNIZANT MAINTENANCE FOREMAN)	01	9/81	02
LZP 1340-4	IMPLEMENTING PROCEDURE FOR FIRE: FIRE BRIGADE	01	9/81	02
LZP 1340-5	IMPLEMENTING PROCEDURE FOR FIRE: FIRE COMPANY NO. 1 (MAINTENANCE PERSONNEL)	01	8/81	02
LZP 1360-1	PROTECTIVE MEASURES FOR ON-SITE PERSONNEL	03	7/81	02
LZP 1360-2	USE OF POTASSIUM IODIDE (KI) AS A THYROID BLOCKING AGENT	00	7/81	03
LZP 1360-4	SEE NEXT PAGE			
LZP 1370-1	RESCUE	00	10/80	02
LZP 1370-2	RSONNEL INJURIES	01	11/80	02
LZP 1370-3	FIRST AID, DECONTAMINATION AND EVACUATION OF EXPOSED AND/OR CONTAMINATED CASUALTIES	00	10/80	02
LZP 1380-1	CONTROL OF OIL SPILLS	00	10/80	02

SAMPLING OF REACTOR COOLANT AT THE HIGH RADIATION SAMPLE SYSTEM

A. PURPOSE

The purpose of this procedure is to delineate a method of obtaining liquid samples at the High Radiation Sample System (HRSS) during normal and post-accident operations, including grab, diluted (1000:1), and undiluted (15 ml) samples.

B. REFERENCES

1. Sentry Equipment Corporation, Post-Accicent Sample System, Volume 1.
2. LZP 1330-29, "Sampling at the High Radiation Sampling System (Valve Operation at the HRSS Valve Control Panel)."
3. LZP 1330-31, "HRSS Sample Movement."
4. AAIS-CCP-0031, "BWR Coolant Radionuclide Analysis."
5. LCP 410-1, "Preparation of Samples for Gamma Ray Spectrometer Measurements."

C. PREREQUISITES

1. The Operator should be familiar with the operation of the HRSS panels.
2. Verify that nitrogen, approximately 100 psig, is available at the Liquid Sampling Panel (LSP), OPL08J.
3. Establish communications with the Unit Nuclear Station Operator (NSO).
4. Equipment:
   a. Clean one liter polyethylene bottles with caps.
   b. Paper towels.
   c. Plastic or rubber gloves.

d. Sample tote tray.

e. Survey instruments, as appropriate.

f. Shielded syringe assembly.

5. The sample must have been obtained in accordance with Reference 2 prior to performing this procedure.

D. PRECAUTIONS

1. A Regulatory Guide 1.3 or 1.4 release of fission products implies extremely high levels of radioactivity. Dose rates may be high enough to prevent entry into many areas of the plant that are normally habitable. Rad/Chem Supervision should be contacted prior to entry into any area when such a release of fission products is suspected.

2. Wear radiation dosimetry as recommended by Rad/Chem Supervision.

3. Wear protective clothing and respiratory protection as recommended by Rad/Chem Supervision.

4. Appropriate survey instruments should be available for monitoring during this procedure.

5. The splash box door of the Liquid Sample Panel (LSP), OPLD8J, must be closed during panel line purge and grab sample collection operations.

E. LIMITATIONS AND ACTIONS

1. Notify Chemistry Supervision if any problems are encountered at the HRSS panels.

2. This procedure, though intended for use under post-accident conditions, can be used for sampling at the HRSS panels during normal operations, during which the precautions may have limited applications. However, normal routine sampling precautions should be observed.

F. PROCEDURE

NOTE

For noun names associated with the valves operated in this procedure, refer to Attachment A.

1. Verify the following valve lineup at the LSP, OPLD8J:

   a. RC-V-1.1 (closed).

   b. RC-V-1.2 (closed).

   c. RC-V-1.3 (closed).

   d. RC-V-1.4 (closed).

   e. RC-V-1.5 (closed).

   f. RC-DV-1 (BYPASS).

   g. RC-V-19 (BYPASS).

2. Connect the flush water hose to RC-D-1 at the LSP, OPLD8J, and open the flush water valve.

3. To obtain a diluted (1000:1) reactor coolant sample, proceed to step F.5. To obtain an undiluted reactor coolant sample (15 ml), proceed to step F.4. To obtain a reactor coolant grab sample, proceed in accordance with the following at the LSP, OPLD8J or as otherwise directed:

   a. Verify the following valve lineup:

      1) RC-V-5.1 (closed).

      2) RC-V-5.2 (closed).

      3) RC-V-17 (closed).

      4) RC-V-17 (closed).

      5) RC-V-4 (closed).

      6) RC-V-11 (closed).

      7) RC-V-9 (closed).

8) RC-V-8.2 (closed).

9) RC-V-8.1 (closed).

10) RC-V-16 (closed).

11) RC-V-18 (6 o'clock).

12) RC-V-22 (TO WASTE).

b. Obtain the sample in accordance with the following:

1) Open RC-V-3.

2) Open RC-V-2.

3) Select one of the sample sources and open its' corresponding valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

4) Slowly open RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Allow to purge for a minimum of five (5) minutes.

5) Slowly close RC-VREL-1 until RC-FI-1 reads 12-15 inches of water. Continue the purge for a minimum of one (1) minute.

6) Close RC-V-3.

7) Open RC-V-7.

8) Slowly open RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Allow to purge for three (3) minutes.

9) Align RC-V-18 to the 3 o'clock position.

10) Open RC-V-17, adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water or RC-G-3 reads 20 PSIG. DO NOT exceed 20 PSIG on RC-G-3. Allow to purge for two (2) minutes.

11) Close RC-V-17 and place a sample bottle under the sample tap.

12) Open RC-V-17. Obtain sufficient sample to rinse the sample bottle.

13) Close RC-V-17 and empty the sample bottle into the tray.

14) Replace the sample bottle under the sample tap and open RC-V-17.

15) Fill the sample bottle to overflow and screw the cap on loosely.

16) Gently squeeze the bottle to effect overflow, then immediately tighten the cap.

NOTE

The physical shape of the polyethylene bottle should be somewhat distorted after step F.3.b.16).

17) Close RC-V-17.

18) Wipe the bottle dry with paper towels.

19) Label the bottle with the following information:

a. Sample point.

b. Date sampled.

c. Time sampled.

d. Initials of person sampling.

NOTE

This labeling may be done prior to taking the sample.

20) Tag the sample bottle with the appropriate sticker if the sample contains radionuclides.

NOTE

This tagging may be done prior to taking the sample.

21) Place the bottle in the tote tray for transport to the chemical laboratory.

c. Flush and secure the system in accordance with the following:

1) At the Valve Control Panel, OPLC9J, secure the sampling lineup in accordance with Reference 2, steps F.1.d.6) through F.1.d.7).

2) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

3) Open RC-V-4.

4) Open RC-V-17, adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

5) Close RC-V-17.

6) Align RC-V-18 to the 6 o'clock position, adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

7) Close RC-V-7.

8) Open RC-V-3.

9) Adjust RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Flush with demineralized water for a minimum of one (1) minute.

10) Close RC-V-3.

11) Open the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5), flush with demineralized water for five (5) minutes.

12) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

13) Close RC-V-4.

14) Close RC-VREL-1 and RC-VREL-2.

15) Close the flush water valve and disconnect the flush water hose from RC-CV-1.

16) Secure the system in accordance with Reference 2, steps F.1.d.8) through F.1.f.

4. To obtain an undiluted (15 ml) reactor coolant sample, proceed in accordance with the following at the LSP, CPLD8J or as otherwise directed:

a. Verify the following valve lineup:

1) RC-V-5.1 (closed).

2) RC-V-5.2 (closed).

3) RC-V-17 (closed).

4) RC-V-4 (closed).

5) RC-V-7 (closed).

6) RC-V-11 (closed).

7) RC-V-9 (closed).

8) RC-V-11 (closed).

9) RC-V-8.1 (closed).

10) RC-V-16 (closed).

11) RC-V-18 (6 o'clock).

12) RC-V-22 (TO WASTE).

b. Prepare the sample bottle in accordance with the following:

1) Place the bottle on the cart/cask assembly cavity piston.

2) Turn the direction valve for the hydraulic piston in the DOWN position and lower the bottle into the cask cavity.

3) Close and open the cask to verify that the cover is working properly.

4) Turn on the LSP undiluted reactor coolant sample fill station lights.

5) Position the cask/cart under the LSP undiluted reactor coolant sample fill station needles and set the brake.

6) Turn the direction valve for the hydraulic piston in the UP position and raise the bottle onto the needles.

c. Obtain the sample in accordance with the following:

1) Open RC-V-3.

2) Open RC-V-2.

3) Select one of the sample sources and open its' corresponding valve. RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

4) Slowly open RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Allow to purge for a minimum of five (5) minutes.

5) Slowly close RC-VREL-1 until RC-FI-1 reads 12-15 inches of water. Continue the purge for a minimum of one (1) minute.

6) Close RC-V-3.

7) Open RC-V-7.

8) Slowly open RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Allow to purge for three (3) minutes.

9) Turn RC-V-19 to SAMPLE.

10) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water or RC-G-3 reads 20 PSIG. DO NOT exceed 20 PSIG on RC-G-3. Allow to purge for two (2) minutes.

11) Close RC-V-7. Let RC-G-3 return to 0 PSIG then wait 30 seconds to allow the sample bottle to depressurize.

12) Turn RC-V-19 to BYPASS.

13) Turn the direction valve for the cart/cask hydraulic plunger to the DOWN position. Lower the sample bottle into the cask and close the cask.

14) At the Valve Control Panel, OPLC9J, secure the sampling lineup in accordance with Reference 2, steps F.1.d.6) through F.1.d.7).

d. Flush and secure the system in accordance with the following:

1) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

2) Open RC-V-7.

3) Open RC-V-4.

4) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

5) Close RC-V-7.

6) Open RC-V-3.

7) Adjust RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Flush with demineralized water for a minimum of one (1) minute.

8) Close RC-V-3.

9) Open the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5), and flush for a minimum of five (5) minutes.

10) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

11) Release the brake and remove the cart/cask from the sample station.

12) Install and secure the auxiliary shield.

13) Install and secure the needle flush tool.

14) Open RC-V-8.1.

15) Open RC-V-8.2.

16) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for one (1) minute.

17) Turn RC-V-19 to SAMPLE.

18) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water or RC-G-3 reads 20 PSIG. DO NOT exceed 20 PSIG on RC-G-3. Allow to flush with demineralized water for two (2) minutes.

19) Close RC-V-2.

20) Allow RC-G-3 return to 0 PSIG then wait 30 seconds to allow the bottle to depressurize.

21) Turn RC-V-19 to BYPASS.

22) Close RC-V-8.2.

23) Close RC-V-8.1.

24) Close RC-V-4.

25) Remove the needle flush tool.

26) Turn off the LSP undiluted reator coolant sample fill station lights.

27) Close the flush water valve and disconnect the flush water hose from RC-DV-1.

28) Secure the system in accordance with Reference 2, steps F.1.d.8) through F.1.f.

5. To obtain a diluted (1000:1) reactor coolant sample, proceed in accordance with the following at the LSP, OPLD8J or as otherwise directed:

a. Fill reservoir RC-R-1 with demineralized water.

b. Open RC-V-20 then open RC-V-21. Adjust reservoir RC-R-1 until the water level in graduated cylinder RC-C-1 is 125 ml.

c. Close RC-V-21.

d. Close RC-V-20.

e. Verify the following valve lineup:

1) RC-V-5.1 (closed).

2) RC-V-5.2 (closed).

3) RC-V-17 (closed).

4) RC-V-4 (closed).

5) RC-V-2 (closed).

6) RC-V-7 (closed).

7) RC-V-11 (closed).

8) RC-V-9 (closed).

9) RC-V-16 (closed).

10) RC-V-18 (6 o'clock).

11) RC-V-19 (BYPASS).

12) RC-V-22 (TO WASTE).

f. Prepare the sample bottle in accordance with the following:

1) Insert the needle of the hand operated vacuum pump into the septum of the diluted reactor coolant sample bottle. Evacuate to the maximum vacuum achievable with the hand operated pump. The vacuum MUST be at LEAST 15 inches of Hg.

2) Keep the hand operated vacuum pump connected to the evacuated bottle for three (3)

minutes to assure that the bottle retains the vacuum.

3) Remove the bottle from the hand operated vacuum pump and place the bottle on the cart/cask assembly cavity piston.

4) Turn the direction valve for the hydraulic piston to the DOWN position and lower the bottle into the cask cavity.

5) Close and open the cask to verify that the cover is working properly.

6) Turn on the LSP diluted reactor coolant sample fill station lights.

7) Position the cask/cart under the LSP diluted reactor coolant sample fill station needle and set the brake.

8) Turn the direction valve for the hydraulic piston to the UP position and raise the bottle onto the needle.

g. Sample in accordance with the following:

1) Open RC-V-8.1.

2) Open RC-V-8.2.

3) Open RC-V-3.

4) Select one of the sample sources and open its' correcponding valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

5) Slowly open RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Purge for a minimum of five (5) minutes.

6) Slowly close RC-VREL-1 until RC-FI-1 reads 12-15 inches of water. Continue the purge for a minimum of one (1) minute.

7) Close RC-V-3.

8) Open RC-V-2.

9) Slowly open RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Purge for three (3) minutes.

10) Close RC-V-8.1.

11) Turn RC-DV-1 to SAMPLE.

12) Close the sample source isolation valve.

13) At the Valve Control Panel, OPLC9J, secure the sampling lineup in accordance with Reference 2, steps F.1.d.6) through F.1.d.7).

14) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

h. Flush and secure the system in accordance with the following:

1) Open RC-V-7.

2) Open RC-V-4.

3) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

4) Close RC-V-7.

5) Open RC-V-3.

6) Adjust RC-VREL-1 until RC-FI-1 reads 35-40 inches of water. Flush with demineralized water for a minimum of one (1) minute.

7) Close RC-V-3.

8) Open RC-V-21.

9) Crack open RC-V-21, and add 24 ml of water from RC-C-1 to the sample bottle, then close RC-V-21.

NOTE

The dilution volume may be changed as desired by Rad/Chem Supervision.

10) Turn RC-DV-1 to BYPASS.

11) Open RC-V-8.1.

12) Adjust RC-VREL-2 until RC-FI-2 reads 18-22 inches of water. Flush with demineralized water for one (1) minute.

13) Close RC-V-2.

14) Open the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5) and flush with demineralized water for a minimum of five (5) minutes.

15) Close the sample valve, RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

16) Close RC-V-8.2.

17) Close RC-V-8.1.

18) Close RC-V-4.

i. Remove the sample and cask/cart assembly and secure the system in accordance with the following:

1) Place the direction valve for the hydraulic plunger in the DOWN position.

2) Lower the bottle into the cask.

3) Close the cask.

4) Release the brake and remove the cart/cask from the sample station.

5) Install and secure the auxiliary shield.

6) Turn off the LSP diluted reactor coolant sample fill station lights.

7) Close the flush water valve and disconnect the flush water hose from RC-DV-1.

8) Secure the system in accordance with Reference 2, steps F.1.d.8) through F.1.f.

6. Transport the samples to the sample preparation area in accordance with Reference 3.

7. Prepare the sample from Step F.4. or F.5. for analysis in accordance with the following:

a. Place a 47 mm fiber filter in a new petri dish and place behind a shielded area with the cover off.

NOTE

If less than 500 ul (0.5 ml) of sample is used, dampen the fiber filter with deionized water prior to placing the sample on the filter.

b. Remove the small shield plug from the top of the shield cask.

c. Using the syringe assembly, withdraw 20 ul of the sample and immediately replace the shield plug.

NOTE

Sample volume and geometry may be changed at the discretion of Rad/Chem Supervision to facilitate analysis of samples.

d. Discharge the sample onto the fiber filter in the petri dish in such a manner that the sample is evenly deposited over the entire fiber filter surface.

e. Place the cover on the petri dish and tape it closed.

f. Wrap the petri dish in plastic wrap and seal it.

g. Label the sample in accordance with the following:

1) System sampled and sample location.

2) Time of sampling.

3) Date of sampling.

4) Sample volume, refer to Step F.8.

5) Initials.

6) Survey results.

8. The sample volume for undiluted samples is the same as the syringe volume discharged. For a diluted sample, calculate the actual volume of sample on the fiber filter in accordance with the following:

$$V = \frac{S \cdot A}{T}$$

Where:

V = The actual volume of reactor water to be analyzed on the filter paper in ml.

S = The volume of the diluted sample in the syringe in ml.

A = The valve aliquot of sample collected in the cask bottle in ml.

T = The total volume in the cask bottle, the valve aliquot of the sample plus the water added from the graduated cylinder in ml.

9. Analyze the samples in accordance with Reference 4.

10. Report the sample results to the Rad/Chem Director for evaluation.

11. Route all output data and calculations to Rad/Chem Supervision for review.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

ATTACHMENT A
VALVE LISTING

RC-V-1.1	Reactor Recirc. Loop B Sample Cutout Valve
RC-V-1.2	RT Demin. Inlet Sample Cutout Valve
RC-V-1.3	RHR Loop A Sample Cutout Valve
RC-V-1.4	RHR Loop B Sample Cutout Valve
RC-V-1.5	RT Demin. Outlet Sample Cutout Valve
RC-V-2	Sample Source Isolation Valve
RC-V-3	Sample Purge Cutout Valve
RC-V-4	Flushing Water Isolation Valve
RC-V-5.1	Pressurized Sample Inlet Isolation Valve
RC-V-5.2	Pressurized Sample Outlet Isolation Valve
RC-V-7	Diluted Sample Bypass Valve
RC-V-8.1	RC-SF-1.2 Inlet Isolation Valve
RC-V-8.2	RC-SF-1.2 Outlet Isolation Valve
RC-V-9	RC-EV-1 Isolation Valve
RC-V-10	RC-EV-1 Evacuation Cutout Valve
RC-V-11	Off-gas 4-way Valve
RC-V-12	Argon to Air Ejector Cutout Valve
RC-V-13	Off-gas Vial Evacuation Cutout Valve
RC-V-14	Argon Supply to Off-gas Vial Cutout Valve
RC-V-15	Off-gas Sample to Gas Chromatograph Isolation Valve
RC-V-16	RC-SF-1.2 Argon Purge Cutout Valve
RC-V-17	Reactor Coolant Grab Sample Cutout Valve

ATTACHMENT A
(Continued)

RC-V-18	Reactor Coolant Undiluted Sample Backflush Cutout Valve
RC-V-19	Reactor Coolant Undiluted Sample Injection Valve
RC-V-20	RC-C-1 Fill Valve
RC-V-21	RC-C-1 Isolation Valve
RC-V-22	Liquid Sample to CAP Isolation Valve
RC-DV-1	Reactor Coolant Diluted Sample Injection Valve
RC-DV-2	Off-gas Sample Injection Valve
RC-VREL-1	Reactor Coolant Purge Throttle Valve
RC-VREL-2	Reactor Coolant Sample Throttle Valve

SAMPLING OF CONTAINMENT AIR AT THE HIGH RADIATION SAMPLING SYSTEM

A. PURPOSE

The purpose of this procedure is to delineate a method of obtaining a containment air sample at the High Radiation Sampling System (HRSS) supplementing the containment monitors during normal and post-accident conditions.

B. REFERENCES

1. Sentry Equipment Corporation, Post-Accicent Sample System, Volume 1.
2. LZP 1330-29, "Sampling at the High Radiation Sampling System (Valve Operation at the HRSS Valve Control Panel)."
3. LZP 1330-31, "HRSS Sample Movement."
4. AAIS-CCP-0002, "General Radionuclide Analysis of a Gas Sample."
5. AAIS-CCP-0003, "Particulate Radionuclide Analysis."
6. AAIS-CCP-0004, "Iodine Radionuclide Analysis."
7. Action Item Record (AIR), 1-81-494.
8. Hewlett Packard Program Instructions, "I-131 Equivalent Concentration."
9. GSEP Environmental Director Emergency Plan Implementing Procedure ED-16, "Quick Estimate of Offsite Dose From Unplanned Release: Liquid and Gaseous."
10. Calculations of Distance Factors for Power and Test Reactor Sites, Chemical Information Document, Division of Licensing and Regulations, Washington, D.C., 23 March 62. TID 14844, Table III.

C. PREREQUISITES

1. Verify that nitrogen pressure, approximately 100 psig, is available at the Containment Air Control Panel (CCP), OPLE2J.

2. Verify that the CCP printer power is ON and the printer is set to the proper date and time.

3. Set the CCP FUNCTION SELECT to the SF1-SF3/GGD position and observe the following at the CCP, OPLE2J:

   a. The POWER ON light turns on.

   b. Annunciator windows glow steady in:

ROW	COL
1	1
1	2
1	3
2	2

   c. The flow monitor 20% and 100% flow lights turn on for approximately 25 seconds after power is first applied.

NOTE

There is no flow at this time.

   d. The 20 minute Gross Gamma Detector (GGD) timer is energized.

NOTE

There is no GGD included in this system, however, the steps were included to clarify the timer sequencing.

4. Press the annunciator RESET pushbutton to turn off all lighted annunciator windows.

5. Verify the timers on the CCP, OPLE2J, are set as follows:

   a. Pre-sample back flush - two minutes.

   b. Sample capture/residual gas removal - three minutes.

c. Sample flask line flush - three minutes.

d. Equilibrate flask pressure and post sample back flush - fifteen seconds.

e. Time between SF1 and SF2 - twenty minutes.

f. Time between GGD exercises - twenty minutes.

g. Time between SF2 and SF3 - 120 minutes.

6. Verify all air and solenoid valve selector switches on the CCP, OPLE2J, are positioned to AUTO.

7. Press the PILOT LIGHT TEST pushbutton on the CCP, OPLE2J, and observe all pilot lights are functional.

8. Press the annunciator TEST button on the CCP, OPLE2J, and verify the following:

   a. Horn sounds.

   b. Annunciator windows flash on and off in:

ROW	COL
1	1
1	2
1	3
2	2

   c. Annunciator window in ROW 2, COL 1 lights up and remains lighted.

   d. Annunciator window in ROW 2, COL 3 is off. This position has no operator function.

9. Release the annunciator TEST pushbutton. Verify that the annunciator window in ROW 2, COL 1 turns off and remains off.

10. Press the annunciator ACKNOWLEDGE pushbutton on the CCP, OPLE2J. Verify the following:

    a. Horn turns off.

b. All flashing windows change to a steady glow.

NOTE

If desired, push the TEST pushbutton to retest ROW 2, COL 1 lamps. ROW 2, COL 1 lamps remain lighted as long as the TEST pushbutton is pressed. The other windows will maintain a steady glow.

11. Press the annunciator RESET pushbutton on the CCP, OPLE2J. Verify that all annunciator windows return to the normal (off) condition.

12. At the Containment Air Sampling Panel (CASP), OPLD9J, verify the following:

    a. The green INACTIVE pilot light is on.

    b. All four green SAMPLE FLASK INACTIVE pilot lights are on.

    c. Sample flasks are properly coupled and locked to the CASP, OPLD9J.

    d. All sample flask inlet and outlet valves are opened.

    e. All sample flask bypass valves are closed.

13. Obtain the sample in accordance with Reference 2 prior to performing this procedure.

14. Equipment:

    a. Reach rods.

    b. Sample flask assemblies.

    c. Partioner sampling assembly.

15. The operator should be familiar with the operation of the HRSS panels.

17. Establish communications with the Unit Nuclear Station Operator (NSO).

D. PRECAUTIONS

1. A Regulatory Guide 1.3 or 1.4 release of fission products implies extremely high levels of radioactivity. Dose rates may be high enough to prevent entry into many areas of the plant that are normally habitable. Rad/Chem Supervision should be contacted prior to entry into any area when such a release of fission products is suspected.

2. Wear radiation dosimetry as recommended by Rad/Chem Supervision.

3. Wear protective clothing and respiratory protection as recommended by Rad/Chem Supervision.

4. Appropriate survey instruments should be available for monitoring during this procedure.

5. Under no circumstances should the sample flask assemblies be uncoupled from the CASP, OPL09J, without either verifying that the "sample flask flushing exercise complete" indicating lights are on or performing a manual flushing operation.

6. Reach rods should be used to open and close the valves on the sample flask assemblies for high radiation level samples.

7. A LOW NEGATIVE CABINET PRESSURE ALARM, at the Containment Air Control Panel, OPLE2J, implies a potential for airborne activity leaking into the HRSS room. Investigate and correct the problem immediately to preclude contamination of the area.

E. LIMITATIONS AND ACTIONS

1. After the "SF3 exercise complete" indicator lights, the START pushbutton becomes inoperative until the CCP SYSTEM RESET button is pushed. This resets the automatic sample sequence program.

2. After the "SF4 exercise complete" indicator lights, the START pushbutton becomes inoperative until the CASP SF4 RESET button is pushed. This signifies that the operator has removed the filled sample flask and replaced it with an empty one.

3. The exercise stop pushbutton, when pushed, will stop automatic sequencing and disable the start pushbutton.

4. If any problems are encountered at the HRSS panels, contact Rad/Chem Supervision.

5. This procedure, though intended for use under post-accident conditions, can be used for sampling at the HRSS panels during normal operations, during which the precautions listed may have limited applications. However, normal routine sampling precautions should be observed.

6. SF1 may be replaced with the post-accident sample partitioner. For purposes of this procedure, SF1 is equal to the post-accident sample partitioner. To obtain a sample in the sample partitioner, proceed in accordance with Step F.1.

F. PROCEDURE

NOTE

For noun names associated with the valves operated in this procedure, refer to Attachment A.

1. Obtain iodine, particulate and noble gas samples in the post-accident sample partitioner in accordance with the following:

   a. Install the sampler unit in the sample partitioner.

   b. Slide the positioner over the top of the sampler unit.

   c. Remove the needle guard.

   d. Place the noble gas vial with septum in its protective housing and place the lid on the vial housing.

   e. Install the vial and housing in the partitioner device.

   f. At the CCP, OPLE2J, adjust the nitrogen pressure regulator PC-1 until the pressure gauge reads 100 psi.

g. Press the SYSTEM RESET button to initialize the automatic sample flask filling program.

h. Press the exercise RESET button and then exercise START button to initiate the automatic sample acquisition sequence.

i. The CCP, OPLE2J, will control the collection of a sample automatically.

j. When the ISOLATE SAMPLE FLASK annunciator window flashes, press the exercise STOP button. This freezes the program in the PAUSE mode.

k. At the partitioner controller, set the counter to the number of aliquots of the sample to be taken as designated by Rad/Chem Supervision, then start the sampling sequence by depressing the START button.

NOTE

The sample time will be determined by the time of and sample injection valve turning and injecting the sample into the partitioner.

l. At the completion of the sampling sequence, the vial and housing will pop up. At the CCP, OPLE2J, release the exercise STOP pushbutton and press the exercise START pushbutton. Pressing the START button initiates a three minute sample flask line flush. When the flush is complete, the programmer returns to the home position and turns on the TIME BETWEEN SF1 - SF2 timer.

NOTE

If the sample lines are not flushed during automatic sample acquisition, a manual line flush must be performed before the sampler unit can be removed from the CASP, OPLD9J. Proceed immediately to Step F.4. for manual sample line flush.

m. When the TIME BETWEEN SF1 - SF2 timer times out, (20 min.) the programmer will repeat the sample acquisition sequence of Step F.1.h. for SF2. If a sample in SF2 is desired, proceed in accordance with Step F.2. If no further

samples are desired proceed in accordance with Steps F.5.c. through F.5.f.

2. To obtain a containment air sample in sample flask (SF) #2, or #3, proceed in accordance with the following at the CCP, OPLE2J, or as otherwise directed:

   a. When the ISOLATE SAMPLE FLASK annunciator window flashes, press the exercise STOP button. This freezes the program in the PAUSE mode.

   b. At the CASP, OPLD9J, close the inlet and outlet valves for the sample flask, SF2, and open the bypass valve.

CAUTION

Reach rods should be used to open and close the valves on the sample flask assemblies for high radiation level samples.

   c. At the CCP, OPLE2J, release the exercise STOP pushbutton and press the exercise START pushbutton. Pressing the START button initiates a three-minute sample flask line flush.

NOTE

If the SF lines are not flushed during automatic sample acquisition, a manual line flush must be performed later before the SF can be removed from the CASP, OPLD9J. Refer to Step F.4.

   d. When the SF2 exercise has ended, the programmer returns to the home position and turns on the following:

      1) TIME BETWEEN GGD EXERCISES timer (20 min.).

      2) TIME BETWEEN SF2-SF3 timer (120 min.).

   e. Four GGD exercises will be accomplished before the TIME BETWEEN SF2-SF3 timer times out. At the completion of the four GGD exercises, the CCP, OPLE2J, will collect the SF3 sample. If the TIME BETWEEN SF2 and SF3 timer times out before completion of a GGD exercise the GGD exercise will continue to completion and then

the SF3 exercise will begin. Perform Steps F.2.a. through F.2.c.

f. Observe that all SF EXERCISE COMPLETE indicators, for sample flasks SF1, SF2, and SF3 on the CCP, OPLE2J, are lighted. If all indicators are lighted, proceed to Step F.5. for system shutdown and cart/cask removal. If all exercise complete indicators are not lighted, proceed immediately to Step F.4 for manual sample flask line flushing. DO NOT uncouple the sampling flasks at this time.

3. To obtain a containment air sample in sample flask #4, SF4, proceed in accordance with the following at the CCP, OPLE2J, or as otherwise directed:

a. Adjust the nitrogen pressure regulator, PC-1, until the pressure gauge reads 100 psi.

b. Place the CCP Function Select Switch to the SF4 position.

c. Press the exercise RESET button and then exercise START button to initiate sampling.

d. The CCP, OPLE2J, will control the collection of a sample automatically through the following sequential operations:

1) Two-minute pre-sample backflush.

2) Three-minute sample capture.

3) Fifteen-second equilibrate flask pressure.

4) Three-minute residual gas removal.

5) Fifteen-second post-sample backflush.

6) Fifteen-second post-sample backflush.

e. When the ISOLATE SAMPLE FLASK annunciator window flashes, press the exercise STOP button. This freezes the program in the PAUSE mode.

f. At the CASP, OPLD9J, close the inlet and outlet valves for the sample flask, SF4, and open the bypass valves.

g. At the CCP, OPLE2J, release the exercise STOP pushbutton and press the exercise START pushbutton. The CCP, OPLE2J, will initiate a three-minute sample flask line flush to complete the sampling sequence.

NOTE

If the SF lines are not flushed during automatic sample acquisition, a manual line flush must be performed later before the sample flask can be removed from CASP, OPLD9J. Refer to Step F.4.

h. Observe that the SF4 exercise complete indicator is lighted. If the indicator is lighted, proceed to Step F.5 for system shutdown and cart/cask removal. If the indicator is not lighted, proceed to Step F.4 to perform a manual flushing operation prior to further action. DO NOT uncouple the sampling flasks at this time.

4. To perform a manual sample flask line flush, proceed in accordance with the following at the CCP, OPLE2J:

a. Turn all air operated and solenoid valves to the CLOSED position.

b. Turn the following valves to the OPEN position.

1) SV-10.

2) SV-1.2 and AV-1 for SF-1 flushing.

3) SV-2.1 and SV-2.2 for SF-2 flushing.

4) SV-3.1 and SV-3.2 for SF-3 flushing.

5) SV-4.1 and SV-4.2 for SF-4 flushing.

c. Flush the sample flask lines for a period of three-minutes and close SV-10 and the inlet and outlet sampling line valves previously opened in Step F.4.b.

d. Proceed to Step F.5. for system shutdown and cart/cask removal.

5. To remove the partitioned sample proceed to Step F.6. To remove the cart/cask and shut the system down, proceed in accordance with the following at the CASP, OPLD9J, or as otherwise directed:

   a. Unlock the quick disconnects from the flushed cask or casks. Remove the cart/cask assembly to the laboratory area in accordance with Reference 3.

   CAUTION

   Reach rods should be used to unlock the quick disconnects on the sample cask assemblies for high level radiation samples.

   b. Install the backup cart/cask assembly.

   c. Push the RESET button at the CASP, OPLD9J, to clear sampling flush indicator lights from ACTIVE to INACTIVE status.

   d. Push the SYSTEM RESET button at the CCP, OPLE2J, to return electro-programmer to initial startup mode.

   e. At the CCP, OPLE2J, turn FUNCTION SELECT to OFF, and remove the tape output from the printer. The tape output should accompany the samples to the chemical laboratory.

   f. Upon completion of the sampling operations, secure the sampling lineup in accordance with Reference 2, Steps F.4.b.6) through F.4.c.

6. To remove the partioned sample, proceed in accordance with the following:

   a. Remove the vial and housing from the partitioner. Log the following information (as appropriate) for entry into the A.A.I.S.:

      1) System sampled and unit.

      2) Sample location.

3) Sample time on.

4) Sample time off (this time will be the same as time on).

5) Sample date on.

6) Sample date off (this date will be the same as date on).

7) Reactor power, megawatts thermal.

8) Reactor power, megawatts electric.

9) Initials.

b. Remove the protective housing from the noble gas vial and determine the radiation level of the sample. If radiation levels warrant, place the vial in a lead shield for transporting to the analytical area.

c. Remove the protective housing from the particulate and iodine cartridges.

d. Remove needle from the sampler unit.

e. Remove the particulate and iodine cartridges.

f. Transport the samples to the sample preparation area in accordance with Reference 3.

g. Separate the particulate filter and iodine cartridge utilizing a knife to cut the connectors. Cut relatively close to the top and bottom of the samples in order to set them flat in secondary containers.

h. Place the silver zeolite iodine cartridge inlet side down into its plastic sample holder.

i. Place the particulate filter inlet side up in a plastic petri dish.

j. Wrap the sample containers in plastic wrap or seal in plastic bag.

k. Label the samples in accordance with the following:

1) System sampled and unit.

2) Sample location.

3) Sample time.

4) Sample date.

5) Sample volume.

6) Survey results.

7) Initials.

1. Prepare the post-accident sample partitioner for further sampling in accordance with Steps F.1.a. through F.1.e.

7. Perform the radioactive analysis for each sample in accordance with Reference 4, 5, or 6, as appropriate.

8. Determine the I-131 equivalent concentration using th Hewlett Packard Calculator program in accordance with Reference 8.

9. If the Hewlett Packard calculator or calculator program "I-131 Equivalent Concentration" is not available, calculate the I-131 equivalent concentration of the containment air sample in accordance with Attachment B.

10. Calculate the iodine, particulate, and noble gases curie content in the primary containment in accordance with the following:

NOTE

Calculations should be performed on the isotopic analysis hard copy printer output.

a. Calculate the total I-131 equivalent curie content of the primary containment in accordance with the following:

$$C = \frac{(S)(1.1E10cc)}{(1E06\ uCi/Ci)}$$

Where: C = Total I-131 equivalent curie content in the primary containment.

S = I-131 equivalent concentration uCi/cc, in the sample from Step F.7. or F.8.

1.1E10 cc = Primary containment free air volume.

b. Sum the particulate radionuclide concentrations, uCi/cc, from the isotopic analysis in Step F.7.

c. Calculate the total particulate curie content of the primary containment in accordance with the following:

$$C = \frac{(S)(1.1E10cc)}{(1E06\ uCi/Ci)}$$

Where C = Total particulate curie content of the primary containment.

S = Particulate radionuclide concentration, uCi/cc, in the sample from Step F.10.b.

1.1E10 cc = Primary containment free air volume.

d. Sum the noble gas radionuclide concentrations, uCi/cc, from the isotopic analysis in Step F.7.

e. Calculate the total noble gas curie content of the primary containment in accordance with the following:

$$C = \frac{(S)(1.1E10cc)}{(1E06\ uCi/Ci)}$$

Where: C = Total noble gas curie content of the primary containment.

S = Noble gases radionuclide concentration, uCi/cc, in the sample from Step F.10.d.

1.1E10 cc = Primary containment free air volume.

11. Report the sample results to the Rad/Chem Director for evaluation in accordance with Reference 9.

12. Route all output data and calculations to Rad/Chem Supervision for review.

13. Dispose of the SF air samples following analysis, in accordance with the following:

    a. At the Valve Control Panel, OPL(?J, proceed in accordance with the following:

        1) Place the UNIT 1(2) POWER switch in the ON position.

        2) Open the following valves and verify the indication shows OPEN:

            a) HRSS SYSTEM AIR RETURN TO SUPPRESSION POOL, 1(2)CM-088 and 1(2)CM-089.

            b) HRSS SYSTEM AIR RETURN TO SUPPRESSION POOL, 1(2)CM-090.

    b. Connect the cask/cart assembly to an available sampling station at the CASP, OPLD9J, and note the sampling station number.

    c. Close the sample flask bypass valve at the CASP, OPLD9J.

    d. Open the sample flask inlet and outlet valves at the CASP, OPLD9J.

    e. At the CCP, OPLE2J, place the FUNCTION SELECT switch in the SF4 position.

    f. Press the EXERCISE STOP pushbutton on the CCP, OPLE2J, if not already depressed.

    g. Turn all air and solenoid operated valves on the CCP, OPLE2J, to the CLOSED position.

    h. Turn the following valves on the CCP, OPLE2J, to the OPEN position:

1) SV-10 to open the nitrogen supply.

2) SV-1.2 and AV-1 for SF-1 flushing.

3) SV-2.1 and SV-2.2 for SF-2 flushing.

4) SV-3.1 and SV-3.2 for SF-3 flushing.

5) SV-4.1 and SV-4.2 for SF-4 flushing.

i. Allow the sample flask to flush for a minimum of three (3) minutes.

j. At the CCP, OPLE2J, turn SV-10 to the CLOSED position.

k. Turn the solenoid operated valves opened in Step F.13.h. to the CLOSED position.

l. Press the SYSTEM RESET button on the CCP, OPLE2J, to return the electroprogrammer to the initial startup mode.

m. Turn the FUNCTION SELECT switch on the CCP, OPLE2J, to the OFF position.

n. Release the EXERCISE STOP pushbutton on the CCP, OPLE2J.

o. Close the sample flask inlet and outlet valves on the CASP, OPLD9J.

p. Unlock the quick disconnects from the cask/cart assembly and remove the cask/cart.

NOTE

The cask/cart may be left coupled to the CASP, OPLD9J, for future analyses.

q. At the Valve Control Panel, OPLC9J, proceed in accordance with the following:

1) Close the following valves and verify the indication shows CLOSED:

a) HRSS SYSTEM AIR RETURN TO SUPPRESSION POOL, 1(2)CM-088 and 1(2)CM-089.

d) HRSS SYSTEM AIR RETURN TO SUPPRESSION POOL, 1(2)CM-090.

2) Place the UNIT 1(2) POWER switch in the OFF position.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

ATTACHMENT A
VALVE LISTING

AV-1	Sample Flask #1 Inlet
SV-1.2	Sample Flask #1 Outlet
SV-2.1	Sample Flask #2 Inlet
SV-2.2	Sample Flask #2 Outlet
SV-3.1	Sample Flask #3 Inlet
SV-3.2	Sample Flask #3 Outlet
SV-4.1	Sample Flask #4 Inlet
SV-4.2	Sample Flask #4 Outlet
SV-5	Sample Purge
AV-2	CASP Outlet
SV-10	Nitrogen Inlet

Determination of I-131 equivalent concentration of the containment air grab sample in the event that computer analysis is not available.

1. Determine the I-135 concentration in the containment air grab sample from Step F.7.

2. Determine the I-135 concentration in the containment air at T_o, the time at which the release was made to the containment, using the following equation:

$$\text{I-135 concentration (uCi/cc) at } T_o = \frac{A}{e^{-\lambda t}}$$

Where:

A = I-135 concentration (uCi/cc) from procedure Step F.7.

e = 2.718

λ = 1.724 E-03 min^{-1} decay const.

t = Sample decay time (min.) - reactor shutdown to sample time (Δ T)

3. Determine the concentration of I-131, I-132, I-133 and I-134 using the following relationships:

I-131 Concentration (uCi/cc) = I-135 concentration x 1.0E-01

I-132 Concentration (uCi/cc) = I-135 Concentration x 9.23E-01

I-133 Concentration (uCi/cc) = I-135 concentration x 6.85E-01

I-134 Concentration (uCi/cc) = I-135 concentration x 1.846

4. Determine the I-131 equivalent concentration of all iodine concentrations in the containment air using the following equation:

Total I-131 Equivalent Concentration (uCi/cc) = I-131 concentration + (I-132 Concentration)(0.036)

+ (I-133 Concentration)(0.027) + (I-134 Concentration)(0.017)

+ (I-135 Concentration)(0.084)

SAMPLING OF REACTOR COOLANT OFF-GAS AT THE HIGH RADIATION SAMPLING SYSTEM

A. PURPOSE

The purpose of this procedure is to delineate a method of obtaining a reactor coolant off-gas sample at the High Radiation Sampling System (HRSS) during normal and post-accident conditions. This procedure includes the steps to route gas to the Chemical Analysis Panel (CAP) and the Chemical Monitoring Panel (CMP for hydrogen analysis.

B. REFERENCES

1. Sentry Equipment Corporation, Post Accident Sample System, Volume 1.
2. LZP 1330-29, "Sampling at the High Radiation Sampling System (Valve Operation at the HRSS Valve Control Panel)."
3. LZP 1330-31, "HRSS Sample Movement."
4. AAIS-CCP-0031, "BWR Coolant Radionuclide Analysis."

C. PREREQUISITES

1. The operator should be familiar with the operation of the HRSS panels.
2. Establish communications with the Unit Nuclear Station Operator (NSO).
3. Verify that argon, and nitrogen, approximately 100 psig, is available at the Liquid Sampling Panel (LSP), CPLD8J.
4. Equipment:
   a. Reach rods.
   b. Griptong.
   c. Reactor coolant off-gas sample bottle with septum.

5. The sample must have been obtained in accordance with Reference 2 prior to performing this procedure.

D. PRECAUTIONS

1. A Regulatory Guide 1.3 or 1.4 release of fission products implies extremely high levels of radioactivity. Dose rates may be high enough to prevent entry into many areas of the plant that are normally habitable. Rad/Chem Supervision should be contacted prior to entry into any area when such a release of fission products is suspected.

2. Wear radiation dosimetry as recommended by Rad/Chem Supervision.

3. Wear protective clothing and respiratory protection as recommended by Rad/Chem Supervision.

4. Appropriate survey instruments should be available for monitoring during this procedure.

E. LIMITATIONS AND ACTIONS

1. Notify Rad/Chem Supervision if any problems are encountered at the HRSS panels.

2. This procedure, though intended for use under post-accident conditons, can be used for sampling at the HRSS panels during normal operations, during which the precautions may have limited applications. However, normal routine sampling precautions should be observed.

F. PROCEDURE

NOTE

For noun names associated with the valves operated in this procedure, refer to Attachment B.

1. Prepare the system for sampling in accordance with the following:

a. Install the needle flush tool.

D. Verify the following valve lineup:

1) RC-V-1.1 (closed).

2) RC-V-1.2 (closed).

3) RC-V-1.3 (closed).

4) RC-V-1.4 (closed).

5) RC-V-1.5 (closed).

6) Verify RC-V-4 is closed. Connect the flush water hose to RC-D-1 and open the flush water line valve.

7) RC-V-5.1 (closed).

8) RC-V-5.2 (closed).

9) RC-V-4 (closed).

10) RC-V-2 (closed).

11) RC-V-7 (closed).

12) RC-V-17 (closed).

13) RC-V-16 (closed).

14) RC-CV-1 (BYPASS).

15) RC-V-19 (BYPASS).

16) RC-CV-2 (9 o'clock).

17) RC-V-15 (closed).

18) RC-V-13 (closed).

19) RC-V-12 (closed).

20) RC-V-14 (closed).

21) RC-V-8.1 (closed).

22) RC-V-11 (CLOSED).

23) RC-V-18 (6 o'clock).

24) RC-V-22 (TO WASTE).

25) RC-V-9 (open).

26) RC-V-8.2 (open).

27) RC-V-10 (open).

28) RC-V-3 (open).

c. Dry the expansion vessel RC-EV-1 in accordance with the following:

1) Turn RC-V-11 clockwise to the 3 o'clock position.

2) Pull open RC-VREL-2. When there is a sharp increase in pressure incicated on RC-G-3, release RC-VREL-2.

3) Adjust RC-VREL-2 until RC-G-3 indicates approximately 20 psig. Dry RC-EV-1 with argon for a minimum of one (1) minute.

4) Turn RC-V-11 counterclockwise to the 9 o'clock position to permit RC-EV-1 to vent, then close RC-V-9.

d. Evacuate the expansion vessel and sample lines in accordance with the following:

1) Install the diluted gas sample bottle on the front panel needle.

2) Open RC-V-13 and then open RC-V-12 and evacuate until RC-G-2.1 and RC-G-2.2 indicate a minimum of 22 inches of mercury.

3) Turn RC-DV-2 to the 6 o'clock position and continue the evacuation until RC-G-2.2 indicates the same reading as RC-G-2.1 or a minimum of 22 inches of mercury.

4) Close in order RC-V-13, RC-V-10, and RC-V-12. Record the vacuum on RC-G-2.1, on

LRC Form 1097A (Attachment A). Wait for a minimum of two (2) mirutes and verify that the vacuum is holding.

5) Turn RC-V-11 clockwise to the CLOSED position.

6) Turn RC-DV-2 to the 9 o'clock position.

7) Open RC-V-14 and verify the pressure on RC-G-2.2 is approximately 1 psig.

e. Purge the sample lines in accordance with the following:

1) Open RC-V-8.1.

2) Open the sample source valve RC-V-1.1 (-1.2, -1.3, -1.4, -1.5) for the sample to be obtained.

3) Slowly open RC-VREL-1 until RC-FI-1 indicates 35-40 inches water. Purge for a minimum of five (5) minutes.

4) Slowly close RC-VREL-1 until RC-FI-1 indicates 12-15 inches water. Continue the purge for a minimum of one (1) minute.

5) Close RC-V-3.

2. Sample in accordance with the following:

a. Open RC-V-2.

b. Adjust RC-VREL-2 until RC-FI-2 indicates 18-22 inches of water. Purge for a minimum of three (3) minutes.

c. Close RC-V-8.2.

d. Close RC-V-8.1.

e. Close RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

f. At the Valve Control Panel, CPLC9J, secure the sampling lineup in accordance with Reference 2, steps F.1.c.6) and F.1.c.7).

g. Open RC-V-7 and then open RC-V-4.

h. Adjust RC-VREL-2 until RC-FI-2 indicates 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

i. Close RC-V-7.

j. Open RC-V-3.

k. Adjust RC-VREL-1 until RC-FI-1 indicates 35-40 inches of water. Flush with demineralized water for a minimum of one (1) minute. Close RC-V-3.

l. Open RC-V-1.1 (-1.2, -1.3, -1.4, -1.5). Flush with demin water for a minimum of five (5) minutes.

m. Close RC-V-1.1 (-1.2, -1.3, -1.4, -1.5).

n. Close RC-V-4.

o. Secure the system lineup in accordance with Reference 2, steps F.1.d.8) through F.1.f.

p. Open RC-V-9, wait approximately five (5) seconds, and close RC-V-9.

q. Open RC-V-16.

r. Snap open RC-V-9 and wait for one (1) minute.

s. Close RC-V-16 and then close RC-V-9.

t. Turn RC-V-11 <u>counterclockwise</u> to the 9 o'clock position. The pressure reading on RC-G-2.1 is normally between 8 and 10 psig. Record the reading on LRC Form 1097A (Attachment A).

u. Verify with the CMP, OPLE4J, operator that the gas chromatograph is ready to receive the sample.

v. Open RC-V-15.

w. Instruct the CMP, OPLE4J, operator to begin loading the gas chromatograph sample loops.

x. Upon notification from the CMP, CPLE4J, operator that all loops are filled, close RC-V-15.

y. The pressure indicated on RC-G-2.1 is normally 5 and 7 psig, record the reading on LRC Form 1097 A (Attachment A).

3. Obtain the diluted gas sample in accordance with the following:

a. Turn RC-DV-2 to the 6 o'clock position. Wait until the pressure on RC-G-2.2 returns to 1 psig.

b. Turn RC-DV-2 to the 9 o'clock position. Close RC-V-14.

c. Remove the griptong containing the diluted gas sample and place behind shielding.

4. Flush the system in accordance with the following:

a. Verify RC-V-15 is closed. Turn RC-V-11 counterclockwise to the 6 o'clock position.

b. Open RC-V-9, RC-V-7 and RC-V-8.1.

c. Adjust RC-VREL-2 until RC-FI-2 indicates 18-22 inches of water. Flush with demineralized water for a minimum of one (1) minute.

d. Open RC-V-8.2.

e. Close RC-V-9 and RC-V-7.

f. Adjust RC-VREL-2 until RC-FI-2 indicates 18-22 inches of water. Flush with demineralized water for a minimum of three (3) minutes.

g. Close RC-V-8.1.

h. Turn RC-V-11 counterclockwise to the 3 o'clock position.

i. Open RC-V-9.

j. Pull open RC-VREL-2. When there is a sharp increase in pressure indicated on RC-G-3, release RC-VREL-2. Adjust RC-VREL-2 until RC-

G-3 indicates 20 psig. Flush with argon for a minimum of three (3) minutes.

k. Close RC-V-9.

l. Open RC-V-10.

m. Turn RC-V-11 counterclockwise to the 9 o'clock position and allow RC-EV-1 to vent.

n. Close RC-V-10.

o. Turn RC-V-11 clockwise to CLOSED.

p. Open RC-V-8.1.

q. Adjust RC-VREL-2 until RC-FI-2 indicates 18-22 inches of water. Flush with water for a minimum of one (1) minute.

r. Terminate flushing by closing the following:

1) RC-V-8.2.

2) RC-V-8.1.

3) RC-V-2.

4) RC-V-4.

s. Close the flush water valve and disconnect the flush water from RC-C-1.

t. At the Valve Control Panel, CPLC9J, perform the following:
1) Secure the sample cooler water flow.

2) Close the remote flush isolation valve.

5. Transport the sample to the sample preparation area in accordance with Reference 3.

6. Prepare the sample for analysis in accordance with the following:

a. Wrap the vial in plastic wrap or seal it in a plastic bag.

b. Label the sample in accordance with the following:

1) System sampled and sample location.

2) Sample time.

3) Sample date.

4) Sample volume.

5) Initials.

6) Survey results.

7. The sample volume in the vial is estimated in accordance with the following:

$$V_o = \frac{V_2 V_3 * (P_2 + 14.7)}{V_1 (P_1 + 14.7)}$$

where V_o = Sample volume in ml.

V_1 = System volume (RC-EV-1 and lines to RC-V-15).

V_2 = Volume of RC-DV-2.

V_3 = Total glass vial volume.

P_1 = Pressure reading from Step F.2.t.

P_2 = Pressure reading from Step F.2.y.

8. Analyze the sample in accordance with Reference 4.

NOTE

The results will be in uCi/ml of off-gas not reactor water.

9. Report the sample results to the Rad/Chem Director for evaluation.

10. Route all output data and calculations to Rad/Chem Supervision for review.

11. To dispose of the reactor coolant off-gas sample, proceed in accordance with the following:

a. Verify the following valve lineup:

1) RC-V-1.1 (closed).

2) RC-V-1.2 (closed).

3) RC-V-1.3 (closed).

4) RC-V-1.4 (closed).

5) RC-V-1.5 (closed).

6) RC-V-10 (closed).

7) RC-V-11 (CLOSED).

8) RC-V-12 (closed).

9) RC-V-13 (closed).

10) RC-V-14 (closed).

11) RC-V-15 (closed).

12) RC-CV-2 (9 o'clock).

b. Install the diluted gas sample bottle on the front panel needle.

c. Open RC-V-13.

d. Open RC-V-12 and evacuate until RC-G-2.2 indicates a minimum vacuum of 22 inches mercury.

e. Turn RC-CV-2 to the 6 o'clock position and continue the evacuation until a minimum vacuum of 22 inches of mercury is indicated on RC-G-2.2.

f. Close in order RC-V-13 and RC-V-12.

g. Open RC-V-14 and allow the bottle to pressurize to approximately 1 psig as indicated on RC-G-2.2.

h. Close RC-V-14.

i. Open RC-V-13 and RC-V-12 and evacuate until RC-G-2.2 indicates a minimum vacuum of 22 inches mercury.

j. Close in order RC-V-13 and RC-V-12.

k. Open RC-V-14 and allow the bottle to pressurize to approximately 1 psig as indicated on RC-G-2.2.

l. Close RC-V-14.

m. Repeat Steps F.11.c through F.11.l three times to remove all radioactive gases.

n. Remove the sample bottle from the panel.

o. Survey the sample bottle and dispose of as directed by Rad/Chem Supervision.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

ATTACHMENT A
LaSalle County Station
HRSS Analyses

Date: _____

pH, LZP 1330-23

Standardization, pH-4 Init/Time: _____

Calibration Check Init/Time: _____

Measured pH: (pH-7) _____

Buffer pH Value: 7.0

Check SAT/UNSAT, ±0.1 pH units: _____

Sample _____ Init/Time: _____

Sample Temperature, °C: _____

Measured pH: _____

If the sample pH > 7.5, correct the pH to 25°C in accordance with the following formula:

$$pH_f = pH_1 + 0.03\ (T_1 - 25)$$

Where: pH_f = pH corrected to 25°C

pH_1 = measured pH

T_1 = Sample Temperature, °C

Conductivity, LZP 1330-23

Sample _____ Init/Time: _____

Sample Temperature, °C: _____

Measured Conductivity, umho/cm: _____

Correct the measured conductivity to 25° C using the following formula:

$$C_1 = \frac{C_2 - \left[0.018 + (5.8E\text{-}5 \times T_1^2)\right]}{1 + 0.018\ (T_1 - 25^{\circ}C)}$$

Where: C_1 = Conductivity corrected to 25°C

C_2 = Measured Conductivity

T_1 = Sample Temperature, °C

Dissolved Oxygen, LZP 1330-23

Calibration _____ Init/Time: _____

Recirc. Water Temperature, °C: _____

Recirc. Water O_2 Conc., mg/l: _____

Sample _____ Init/Time: _____

Sample D.O., mg/l: _____

Off-Gas LZP 1330-27

Vacuum, RC-G-2.1., Step F.1.d.4. _____

Pressure, RC-G-2.1., Step F.2.t. _____

Pressure, RC-G-2.1., Step F.2.y. _____

Sample _____ Init/Time: _____

Comments: _____

Reviewed: _____

ph at 25°C: _____ Conductivity at 25°C, umho/cm: _____

LRC FORM 1097A

ATTACHMENT B
VALVE LISTING

RC-V-1.1	Reactor Recirc Loop B Sample Cutout Valve
RC-V-1.2	RT Demin Inlet Sample Cutout Valve
RC-V-1.3	RHR Loop A Sample Cutout Valve
RC-V-1.4	RHR Loop B Sample Cutout Valve
RC-V-1.5	RT Demin Outlet Sample Cutout Valve
RC-V-2	Sample Source Isolation Valve
RC-V-3	Sample Purge Cutout Valve
RC-V-4	Flushing Water Isolation Valve
RC-V-5.1	Pressurized Sample Inlet Isolation Valve
RC-V-5.2	Pressurized Sample Outlet Isolation Valve
RC-V-7	Diluted Sample Bypass Valve
RC-V-8.1	RC-SF-1.2 Inlet Isolation Valve
RC-V-8.2	RC-SF-1.2 Outlet Isolation Valve
RC-V-9	RC-EV-1 Isolation Valve
RC-V-10	RC-EV-1 Evacuation Cutout Valve
RC-V-11	Off-gas 4-way Valve
RC-V-12	Argon to Air Ejector Cutout Valve
RC-V-13	Off-gas Vial Evacuation Cutout Valve
RC-V-14	Argon Supply to Off-gas Vial Cutout Valve
RC-V-15	Off-gas Sample to Gas Chromatograph Isolation Valve
RC-V-16	RC-SF-1.2 Argon Purge Cutout Valve
RC-V-17	Reactor Coolant Grab Sample Cutout Valve
RC-V-18	Reactor Coolant Undiluted Sample Backflush Cutout Valve.
RC-V-19	Reactor Coolant Undiluted Sample Injection Valve
RC-V-20	RC-C-1 Fill Valve
RC-V-21	RC-C-1 Isolation Valve
RC-V-22	Liquid Sample to CAP Isolation Valve

ATTACHMENT B (Cont'd)

RC-DV-1	Reactor Coolant Diluted Sample Injection Valve
RC-DV-2	Off-gas Sample Injection Valve
RC-VREL-1	Reactor Coolant Purge Throttle Valve
RC-VREL-2	Reactor Coolant Sample Throttle Valve

SAMPLING OF PROCESS WATERS CONTAINING RADIOACTIVITY AT THE HIGH RADIATION SAMPLING SYSTEM

A. PURPOSE

The purpose of this procedure is to delineate a method of obtaining samples of the drywell sumps and HRSS waste tank at the High Radiation Sampling System (HRSS) during normal and post-accident conditions.

B. REFERENCES

1. Sentry Equipment Corporation, Post-Accident Sample System, Volume 1.
2. LZP 1330-29, "Sampling at the High Radiation Sampling System (Valve Operations at the HRSS Valve Control Panel)."
3. LZP 1330-31, "HRSS Sample Movement."
4. AAIS-CCP-0001, "General Radionuclide Analysis of a Liquid Sample".
5. LCP 410-1, "Preparation of Samples for Gamma Ray Spectrometer Measurements."

C. PREREQUISITES

1. The operator should be familiar with the operation of the HRSS panels.
2. Establish communications with the Unit Nuclear Station Operator (NSO).
3. Equipment:
   a. Reach rods.
   b. Sample cart/cask assembly.
   c. Sample bottle with septum, 15 ml.
   d. Needle flush tool with demineralized water filled sample bottle and septum.

e. Shielded Syringe assembly.

4. The sample must have been obtained in accordance with Reference 2 prior to performing this procedure.

5. Ensure nitrogen pressure, approximately 100 PSIG, is available at the Liquid Sampling Panel (LSP), OPL08J.

D. PRECAUTIONS

1. A Regulatory Guide 1.3 or 1.4 release of fission products implies extremely high levels of radioactivity. Dose rates may be high enough to prevent entry into many areas of the plant that are normally habitable. Rad/Chem Supervision should be contacted prior to entry into any area when such a release of fission products is suspected.

2. Wear radiation dosimetry as recommended by Rad/Chem Supervision.

3. Wear protective clothing and respiratory protection as recommended by Rad/Chem Supervision.

4. Appropriate survey instruments should be available for monitoring during this procedure.

5. The splash box door of the Liquid Sample Panel (LSP), OPL08J, must be closed during panel line purge and grab sample collection operations.

E. LIMITATIONS AND ACTIONS

1. Notify Rad/Chem Supervision if any problems are encountered at the HRSS panels.

2. This procedure, though intended for use under post-accident conditions, can be used for sampling at the HRSS panel during normal operations, during which the precautions listed may have limited applications. However, normal routine sampling precautions should be observed.

F. PROCEDURE

NOTE

For the noun names associated with the valves operated in this procedure, refer to Attachment A.

1. Perform the following valve lineup at the LSP, OPLD8J:

   a. RW-V-1.1 (closed).

   b. RW-V-1.2 (closed).

   c. RW-V-1.3 (closed).

   d. RW-V-1.4 (closed).

   e. RW-V-1.5 (closed).

   f. RW-V-1.6 (closed).

   g. RW-V-1.7 (closed).

   h. RW-V-1.8 (closed).

   i. RW-V-1.9 (closed).

   j. RW-V-1.10 (closed).

   k. RW-V-2.1 (closed).

   l. RW-V-2.2 (closed).

   m. RW-V-2.3 (closed).

   n. RW-V-2.4 (closed).

   o. RW-V-2.5 (closed).

   p. RW-V-2.6 (closed).

   q. RW-V-2.7 (closed).

   r. RW-V-2.8 (closed).

   s. RW-V-2.9 (closed).

t. RW-V-2.1C (closed).

u. RW-V-3 (closed).

v. RW-V-4 (closed).

w. RW-V-9 (closed).

x. RW-V-10 (closed).

y. RW-V-6 (closed).

z. RW-V-5 (6 o'clock).

aa. RW-V-7 (BYPASS).

ab. RW-V-8 (BYPASS).

2. Connect the flush water hose to RW-D-1 on the LSP, OPL08J, and open the flush water line valve.

3. To obtain a diluted (1000:1) radioactive waste sample, proceed to Step F.6. To obtain an undiluted (15 ml) radioactive waste sample, proceed to Step F.5. If neither, proceed to Step F.4.

4. To obtain an open grab sample, proceed in accordance with the following at the LSP, OPL08J or as otherwise directed:

CAUTION

The splash box door of the Liquid Sample Panel (LJP), OPL08J, must be closed during panel line purge and grab sample collection operations.

a. Open RW-V-1.1 (-1.2, -1.3) depending on the sample source, and recirc for a minimum of six minutes, then close RW-V-1.1 (-1.2, -1.3).

b. Open RW-V-2.1 (-2.2, -2.3) depending on the sample source.

c. Slowly open RW-V-4 until RW-FI-1 indicates 4-8 inches of water. Purge to waste for a minimum of one (1) minute.

d. Open RW-V-6, purge a minimum of 50 ml of liquid to waste, then close RW-V-6.

e. Open the splash box door and place the sample bottle under RW-V-6. Then close the splash box door.

f. Open RW-V-6, collect the desired sample, and close RW-V-6.

g. Close RW-V-2.1 (-2.2, -2.3) depending on the sample source.

h. Close RW-V-4. Open the splash box door.

i. Dry the sample bottle, remove and place in a tote tray for transporting to the laboratory. Close the splash box door.

j. At the Valve Control Panel, CPLC9J, secure the sampling lineup in accordance with Reference 2, Steps F.2.c.15) through F.2.c.17) OR Steps F.3.f through F.3.g depending on the sample source sampled.

k. Fully open RW-V-4.

l. Slowly open RW-V-3 until RW-FI-1 indicates 4-8 inches of water. Flush with demineralized water for a minimum of two (2) minutes.

m. Close RW-V-4.

n. Open RW-V-1.1 (-1.2, -1.3) depending on the sample source sampled.

o. Fully open RW-V-3 and flush with demineralized water for a minimum of six (6) minutes.

p. Close RW-V-1.1 (-1.2, -1.3).

q. Open RW-V-2.1 (-2.2, -2.3) depending on the sample source sampled.

r. Slowly open RW-V-4 until RW-FI-1 reads 4-8 inches of water. Purge to waste for a minimum of two (2) minutes.

s. Open RW-V-6, purge a minimum of 50 ml of liquid to waste, then close RW-V-6.

t. Close RW-V-2.1 (-2.2, -2.3) and RW-V-4.

u. At the Valve Control Panel, CPLC9J, align the LIQUID SAMPLE BACKFLUSH switch, for radwaste side, to the backflush line associated with the sample source sampled. Flush with demineralized water for a minimum of six (6) minutes.

v. Align the LIQUID SAMPLE BACKFLUSH switch to the OFF position.

w. Close RW-V-3.

x. Close the flush water valve and disconnect the flush water line from RW-DV-1.

y. If no further samples are to be obtained from this sample source, secure the sampling lineup in accordance with Reference 2, Steps F.2.c.19) through F.2.d OR Step F.3.i depending on the sample source sampled.

5. To obtain an undiluted (15 ml) radioactive waste sample, proceed in accordnace with the following at the LSP, CPLD8J or as otherwise directed:

a. Place the bottle on the cart/cask assembly cavity piston.

b. Turn the direction valve for the hydraulic piston in the DOWN position and lower the bottle in the cask cavity.

c. Close and open the cask to verify that the cover is working properly.

d. Position the cask/cart under the LSP undiluted radwaste fill station needles and set the brake.

e. Turn the direction valve for the hydraulic piston to the UP position and raise the bottle onto the needles.

f. Open Rw-V-1.1 (-1.2, -1.3) depending on the sample source, and recirculate for a minimum of six (6) minutes.

g. Close RW-V-1.1 (-1.2, -1.3) and open RW-V-2.1 (-2.2, -2.3) depending on the sample source.

h. Slowly open RW-V-4 until RW-FI-1 indicates 4-8 inches of water. Purge to waste for a minimum of one (1) minute.

i. Turn RW-V-7 to SAMPLE. DO NOT exceed 20 psig on RW-G-1 in this step. Adjust RW-V-4 until RW-G-1 indicates 20 psig or RW-FI-1 indicates 10-14 inches of water. Purge for a minimum of one (1) minute.

j. Close RW-V-2.1 (-2.2, -2.3).

k. Let RW-G-1 return to 0 psig and wait 30 seconds to allow the bottle to depressurize.

l. Turn RW-V-7 to BYPASS.

m. Turn the direction valve for a cask/cart hydraulic plunger to the DOWN position and lower the bottle into the cask.

n. Close the cask. Release the brake and remove the cart/cask from the sample station.

o. Install and secure the auxiliary shield on the cart/cask assembly.

p. Install and secure the needle flush tool on the LSP, OPLD8J.

q. At the Valve Control Panel, OPLC9J, secure the sample lineup in accordance with Reference 2, Steps F.2.c.15) through F.2.c.17) OR Steps F.3.f through F.3.g depending on the sample source sampled.

r. Fully open RW-V-4.

s. Slowly open RW-V-3 until RW-FI-1 indicates 4-8 inches of water. Flush with demineralized water for a minimum of two (2) minutes.

t. Close RW-V-4.

u. Open RW-V-1.1 (-1.2, -1.3) depending on the sample source.

v. Fully open Rw-V-3 and flush with demineralized water for a minimum of six (6) minutes.

w. Close RW-V-1.1 (-1.2, -1.3).

x. Open Rw-V-2.1 (-2.2, -2.3) depending on the sample source.

y. Slowly open Rw-V-4 until Rw-FI-1 reads 4-8 inches of water. Purge to waste for a minimum of two (2) minutes.

z. Close Rw-V-2.1 (-2.2, -2.3) and Rw-V-4.

aa. At the Valve Control Panel, CPLC9J, align the LIQUID SAMPLE BACKFLUSH switch, for the radwaste side, to the backflush line associated with the sample source sampled. Flush with demineralized water for a minimum of six (6) minutes.

ab. Align the LIQUID SAMPLE BACKFLUSH switch to the OFF position.

ac. Turn Rw-V-7 to SAMPLE. DO NOT exceed 20 psig on Rw-G-1 in this step. Slowly open Rw-V-4 until Rw-G-1 indicates 20 psig or Rw-FI-1 indicates 10-14 inches of water. Purge for a minimum of one (1) minute.

ad. Close Rw-V-4 and let Rw-G-1 return to 0 psig. Wait 30 seconds to allow the bottle to depressurize.

ae. Turn Rw-V-7 to BYPASS.

af. Secure flushing by closing Rw-V-3.

ag. Close the flush water valve and disconnect the flush water line from Rw-DV-1.

ah. Remove the needle flush tool from the LSP, CPLD8J.

ai. If no further samples are to be obtained from this sample source, secure the sampling lineup in accordance with Reference 2, Steps F.2.c.19) through F.2.d OR Step F.3.a depending on the sample source sampled.

6. To obtain a diluted (1000:1) radioactive waste sample, proceed in accordance with the following at the LSP, OPLD8J or as otherwise directed:

   a. Verify RW-DV-1 is turned to BYPASS. Fill reservoir RW-R-1 with demineralized water. Open RW-V-10 and then RW-V-9. Adjust reservoir RW-R-1 until the water level in graduated cylinder RW-C-1 is 125 ml. Close RW-V-10 and RW-V-9.

   b. Align RW-V-8 to the BYPASS (9 o'clock) position.

   c. Align RW-DV-1 to the BYPASS position.

   d. Insert the needle of the hand operated vacuum pump into the septum of the diluted radwaste sample bottle.

   e. Evacuate to the maximum vacuum achievable with the hand operated pump. The vacuum MUST be at LEAST 15 inches of HG.

   f. Keep the hand operated vacuum pump connected to the evacuated bottle for three minutes to assure that the bottle retains the vacuum.

   g. Remove the bottle from the hand operated vacuum pump and place the bottle on the cart/cask assembly cavity piston.

   h. Turn the direction valve for the hydraulic piston to the DOWN position and lower the bottle into the cask cavity. Close and open the cask to verify that the cover is working properly.

   i. Position the cask/cart under the LSP diluted radwaste fill station needle and set the brake.

   j. Turn the direction valve for the hydraulic piston to the UP position and raise the bottle onto the needle.

   k. Open RW-V-1.1 (-1.2, -1.3) depending on the sample source and recirc for six (6) minutes. Close RW-V-1.1 (-1.2, -1.3).

   l. Open RW-V-2.1 (-2.2, -2.3) depending on the sample source.

m. Slowly open RW-V-4 until RW-FI-1 indicates 45-50 inches of water. Purge to waste for a minimum of one (1) minute.

n. Turn RW-V-8 to BYPASS.

o. Close RW-V-2.1 (-2.2, -2.3).

p. At the Valve Control Panel, CPLC9J, secure the sample lineup in accordance with Reference 2, Steps F.2.c.15) through F.2.c.17) OR Steps F.3.f through F.3.g depending on the sample source sampled.

q. Fully open RW-V-4.

r. Slowly open RW-V-3 until RW-FI-1 indicates 4-8 inches of water. Flush with demineralized water for a minimum of two (2) minutes.

s. Close RW-V-4.

t. Open RW-V-1.1 (-1.2, -1.3) depending on the sample source sampled. Fully open RW-V-3 and flush with demineralized water for a minimum of six (6) minutes.

u. Close RW-V-1.1 (-1.2, -1.3).

v. Open RW-V-2.1 (-2.2, -2.3) depending on the sample source sampled.

w. Slowly open RW-V-4 until RW-FI-1 reads 4-8 inches of water. Flush with demineralized water for a minimum of two (2) minutes.

x. Close in order RW-V-2 and RW-V-4.

y. At the Valve Control Panel, CPLC9J, align the LIQUID SAMPLE BACKFLUSH switch, for the radwaste side, to the backflush line associated with the sample source sampled. Flush with demineralized water for a minimum of six (6) minutes.

z. Align the LIQUID SAMPLE BACKFLUSH switch to the OFF position.

aa. Turn RW-CV-1 to SAMPLE.

ab. Crack open RW-V-9, and add 24 ml of water from RW-C-1 to the sample bottle, then close RW-V-9.

NOTE

The dilution volume may be changed as directed by Rad/Chem Supervision.

ac. Turn RW-CV-1 to BYPASS.

ad. Place the direction valve for the hydraulic plunger in the DOWN position and lower the bottle into the cask.

ae. Close the cask.

af. Turn RW-V-8 to the 9 o'clock position.

ag. Slowly open RW-V-4 until RW-FI-1 indicates 45-50 inches of water. Flush with demineralized water for two (2) minutes.

ah. Turn RW-V-8 to BYPASS.

ai. Secure flushing by closing RW-V-4 and RW-V-3.

aj. Release the brake and remove the cart/cask from the sample station.

ak. Install and secure the auxiliary shield on the cart/cask assembly.

al. Close the flush water valve and disconnect the flush water hose for RW-CV-1.

am. If no further samples are to be obtained from this sample source, secure the sampling lineup in accordance with Reference 2, Steps F.2.c.19) through F.2.d OR Step F.3.i depending on the sample source sampled.

7. Transport the samples to the sample preparation area in accordance with Reference 3.

8. Prepare the sample from Step F.6 for analysis in accordance with the following:

a. Place a 47 mm fiber filter in a new petri dish and place behind a shielded area with the cover off.

NOTE

If less than 500 ul (0.5 ml) of sample is used, dampen the fiber filter with deionized water prior to placing the sample on the filter.

b. Remove the small shield plug from the top of the shield cask.

c. Using the syringe assembly, withdraw 20 ul of the sample and immediately replace the shield plug.

NOTE

Sample volume and geometry may be changed at the discretion of Rad/Chem Supervision to facilitate analysis of samples.

d. Discharge the sample onto the fiber filter in the petri dish in such a manner that the sample is evenly deposited over the entire fiber filter surface.

e. Place the cover on the petri dish and tape it closed.

f. Wrap the petri dish in plastic wrap and seal it.

g. Label the sample in accordance with the following:

1) System sampled and sample location.

2) Time of sampling.

3) Date of sampling.

4) Sample volume, refer to Step F.9.

5) Initials.

6) Survey results.

9. The sample volume for undiluted samples is the same as the syringe volume discharged. For a diluted sample, calculate the actual volume of sample on the filter paper in accordance with the following:

$$V = \frac{S \cdot A}{T}$$

where:
- V = The actual volume of the rad-waste sample to be analyzed on the fiber filter in ml.
- S = The volume of the diluted sample in the syringe in ml.
- A = The valve aliquot of sample collected in the cask bottle in ml.
- T = The total volume in the cask bottle, the valve aliquot of sample plus the water added from the graduated cylinder in ml.

10. Analyze the samples in accordance with Reference 4.

11. Report the sample results to the Rad/Chem Director for evaluation.

12. Route all output data and calculations to Rad/Chem Supervision for review.

G. CHECKLISTS

1. None.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

ATTACHMENT A

VALVE LISTING

RW-V-1.1	Spare
RW-V-1.2	Spare
RW-V-1.3	Spare
RW-V-1.4	Spare
RW-V-1.5	Spare
RW-V-1.6	Spare
RW-V-1.7	Spare
RW-V-1.8	HRSS Waste Tank Sample Recirc Valve
RW-V-1.9	U-1 Drywell Equip. Drain Sample Recirc Valve
RW-V-1.10	U-2 Drywell Equip. Drain Sample Recirc Valve
RW-V-2.1	Spare
RW-V-2.2	Spare
RW-V-2.3	Spare
RW-V-2.4	Spare
RW-V-2.5	Spare
RW-V-2.6	Spare
RW-V-2.7	Spare
RW-V-2.8	HRSS Waste Tank Sample Cutout Valve
RW-V-2.9	U-1 Drywll Equip. Drain Sample Cutout Valve
RW-V-2.10	U-2 Drywll Equip. Drain Sample Cutout Valve
RW-V-3	Flushing Water Isolation Valve
RW-V-4	Rad-Waste Sample Throttle Valve
RW-V-5	Backflush Cutout Valve
RW-V-6	Radwaste Grab Sample Valve
RW-V-7	Radwaste Undiluted Sample Injection Valve
RW-V-8	Rad-Waste Diluted Sample Cutout Valve
RW-V-9	RW-C-1 Fill Valve
RW-V-10	RW-C-1 Isolation Valve
RW-DV-1	Rad-Waste Diluted Sample Injection Valve