REVISED 1-12-84

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WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTATION PROCEDURE	NO. EP-RET-3C REV. B TITLE: Post Accident Operation of the High Radiation Sample Room DATE: JAN 12 1984 PAGE 1 of 24
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1.0 PURPOSE

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

2.0 APPLICABILITY

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

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

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

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

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

e. Containment Hydrogen Analyzer measurement (Sect 5.5).

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

3.0 PRECAUTIONS

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

3.2 Contact Health Physics Dept for:

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

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

4.0 REFERENCES

4.1 Sentry HRSS Operating and Maintenance Manual

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

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

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

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

5.0 PROCEDURE

5.1 Dilute Liquid Grab Sample

5.1.1 Proceed to HRSR per HP/RPD recommendations.

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

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

5.1.4 Check the following Lab Equipment available and operational:

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

5.1.5 Evacuate the diluted sample bottle (25 ml, large bottle) to 15 inches of vacuum or greater. Install in sample cask and check cask for proper operation. (large holder in cask)

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

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

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

5.1.9 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

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

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

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

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

5.1.16 Turn DV-1 to "Bypass".

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

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

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

5.1.20 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

5.1.24 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

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

NOTE: Total dilution is (x 10^8)

5.2 Inline Sample for pH, Cond, O_2 and Cl

5.2.1 Proceed to HRSR per HP/RPD recommendations.

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

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

5.2.4 Verify the following lab equipment available and operational.

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

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

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

5.2.7 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

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

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

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

5.2.13 When the YSI O_2 meter chart reading has stabilized:

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

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

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

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

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

5.2.17 Upon completion of flush to CAP:

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

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

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

5.2.19 At the Sample Acquisition Panel:

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

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

5.2.20 At the Liquid Sample Panel:

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

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

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

5.2.22 At the Sample Acquisition Panel:

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

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

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

5.3 Hydrogen and Gaseous Activity Grab Sample

5.3.1 Proceed to HRSR per HP/RPD recommendations.

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

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

5.3.4 Verify the following lab equipment available and operational:

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

5.3.5 Dry the expansion vessel: Turn V-11 to "Argon" (3 o'clock position)
Open V-9
Open V-8.2
Open V-10

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

5.3.7 Upon completion of Drying Expansion Vessel:

Turn V-11 to 9 o'clock position (counterclockwise direction)
Shut V-9
Shut V-8.2

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

5.3.9 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

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

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

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

Shut V-15
Shut V-13

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

NOTE: Observe vacuum reading on both gauges holding steady.

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

5.3.16 Upon completion of purge (from step 5.3.11):

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

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

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

5.3.18 Upon completion of sample purge:

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

5.3.19 Upon completion of gas stripping, commence LSP flush:

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

5.3.20 Obtain the diluted gas sample by turning DV-2 to 12 o'clock position.

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

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

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

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

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

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

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

5.3.27 At the Sample Acquisition Panel:

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

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

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

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

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

5.3.30 At the Sample Acquisition Panel:

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

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

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

5.3.31 At the LSP flush the expansion vessel:

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

Allow system to flush for 2 minutes.

5.3.32 Upon completion of flush: Turn V-11 to "Argon" position (3 o'clock) and blow expansion vessel dry

5.3.33 Upon completion of drying expansion vessel:

Turn V-11 to Close (counterclockwise)
Shut V-9
Shut V-8.2

5.3.34 Remove radioactive gases from gas system:

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

Evacuate system for 1 full minute.

5.3.35 Upon evacuation of gas system:

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

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

5.4 Undiluted Liquid Grab Sample

5.4.1 Proceed to HRSR per HP/RPD recommendations.

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

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

5.4.4 Check the following lab equipment available and operational:

a. DI water flush hoses connected to LSP and supply valve open.
b. Check valve lineup per Attachment #1.
c. Reach rod for remote valve operation.
d. New undiluted liquid sample bottle available. (15 ml bottle)
e. New undiluted liquid flush bottle, with special tool, available.
f. Sample cask available with undiluted sample piston installed.
g. Light on in undiluted sample port of LSP.

5.4.5 Install undiluted sample bottle (15 ml bottle) in cask and check for proper operation. (using small sample holder)

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

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

5.4.8 At the Sample Acquisition Panel:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5.4.19 At the Sample Acquisition Panel:

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

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

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

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

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

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

5.4.22 At the Sample Acquisition Panel:

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

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

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

5.5 Containment Hydrogen Monitor 1A & 1B Operation Procedure

5.5.1 Proceed to HRSR per HP/RPD recommendations.

5.5.2 Check ventilation on in "normal" position.

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

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

5.5.5 Insure heat tracing is energized and operational.

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

5.5.7 For H_2 Analyzer A call Control Room to open valves LOCA 2A and LOCA 10A and SA 700 3A.

5.5.8 For H_2 Analyzer B call Control Room to open valves LOCA 2B and LOCA 10B and SA 700 3B.

5.5.9 Push the "remote selector" pushbutton to gain access at the remote panel.

5.5.10 Switch analyzer to Sample Mode. Allow 10 minutes for sample purge time.

5.5.11 Read sample in percent hydrogen off remote panel meter.

NOTE: If problems are encountered with selected analyzer, go to SAP and after checking status of CASP switch to other analyzer, and repeat procedure.

5.6 Containment Air Sample Panel Operation

NOTE: For normal post accident sampling of containment use EP-RET-3D.

5.6.1 Proceed to HRSR per HP/RPD recommendations.

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

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

5.6.4 Insure that N_2 supply regulator is set at 150 psi and bottle contains at least 500 psig N_2.

5.6.5 Verify that CASP and CASP Control Panels are energized and operational. Ensure that the heat tracing is on.

5.6.6 Place the four sample carts in the four sample positions and lock in place. Check carts are properly locked in by trying to pull away.

NOTE: Only Sample Station 1 can be used for Iodine Analysis.

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

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

Loop A	Loop B
LOCA-2A	LOCA-2B
LOCA-10A	LOCA-10B
SA 700 3A	SA 700 3B

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

5.6.10 Connect local pressure transmitter to cart selected for sampling.

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

5.6.11 CASP two minute pre-sample back flush:

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

Insure flow monitor on CASP is indicating flow.

5.6.12 Three minute sample capture:

SV-5 Closed
AV-2 Open

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

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

5.6.13 Fifteen second flask equilibration:

SV-6 Closed

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

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

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

Flow Monitor should indicate flow.

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

Flow Monitor should indicate flow.

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

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

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

SV-10 Closed
SV-6 Closed

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

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

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

Attachment 1

VALVE LINEUP SHEET

Sample Acquisition Panel

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

Attachment 1 (cont'd)

Liquid Sample Panel

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

Attachment 1 (cont'd)

Liquid Sample Panel (cont'd)

DV-1	Diluted Liquid Sample	BYPASS
V-11	Expansion Vessel Outlet	CLOSED
DV-2	Diluted Gas Smpl	3 o'clock
V-10	Expansion Vessel Vacuum	SHUT
V-13	Dil Gas Smpl Vac	SHUT
V-14	Argon Purge to Dil Gas Smpl	SHUT
V-15	Gas Smpl to GC	SHUT
V-12	Argon to Eductor	SHUT

Liquid Sample Panel (Demin Sect)

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

Attachment 1 (cont'd)

CASP Control Panel

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

(At Sample Acquisition Panel)

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

Attachment 1 (cont'd)

Chemical Analytical Panel

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

I.M.C.C. CONTROL PANEL

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

WISCONSIN PUBLIC SERVICE CORPORATION Kewaunee Nuclear Power Plant EMERGENCY PLAN IMPLEMENTING PROCEDURE	NO. EP-TSC-7 TITLE: RV Head Venting Time Calculation DATE: JAN 12 1984 | PAGE 1 of 3
REVIEWED BY M L Marchi	APPROVED BY [illegible]

1.0 APPLICABILITY

This procedure provides instructions for determining the maximum allowable venting period of the reactor vessel head when noncondensable gases are present in the RCS.

2.0 PRECAUTIONS

2.1 This procedure should be done concurrently with E-0-12, "Postaccident Systems Operation" section 4.1, Reactor Vessel Head Vent.

3.0 REFEPENCES

3.1 "Background Information for Westinghouse Emergency Response Guidelines, FR-I.3 Void in Reactor Vessel".
Rev. LP-BASIC September, 15, 1981.

3.2 "FR-I.3, Response to Voids in Reactor Vessel".
LP-Rev. 1, September 1, 1983.

3.3 EP-RET-3C, "Post Accident Operation of the High Radiation Sample Room".

4.0 INSTRUCTIONS

4.1 Ensure that the containment hydrogen analyzer has been placed in service per EP-RET-3C. Allow a minimum sample purge time of ten minutes.

4.2 All available containment air circulating equipment should be operating to prevent the formation of hydrogen gas pockets and ensure a representative sample is obtained. If only one containment dome fan is operating, the sample should be taken from the operating fan discharge.

4.3 Maximum Allowed Venting Time

4.3.1 Record or determine the following values:

RCS pressure _____ psig
cntmt. hydrogen conc. _____ % $\leq$ max. allowable 3%
cntmt. pressure _____ psig

cntmt. abs. pressure (cntmt. press. + 14.7 psi) _____psia

cntmt. temperature _____°F

cntmt. absolute temperture (cntmt. temp. +460°R) _____°R

4.3.2 Calculate containment volume at STP = A (scf)

$$A = 1.32E{+}06 \text{ cf} \times \frac{\text{(cntmt. absolute pressure)}}{14.7 \text{ psia}} \times \frac{492°R}{\text{(cntmt. abs. temperature)}}$$

= _____ scf

4.3.3 Calculate maximum hydrogen volume that can be vented = B (scf)

$$B = \left[3\% - \text{(cntmt.hydrogen conc.)} \right] \times A$$

= _____scf

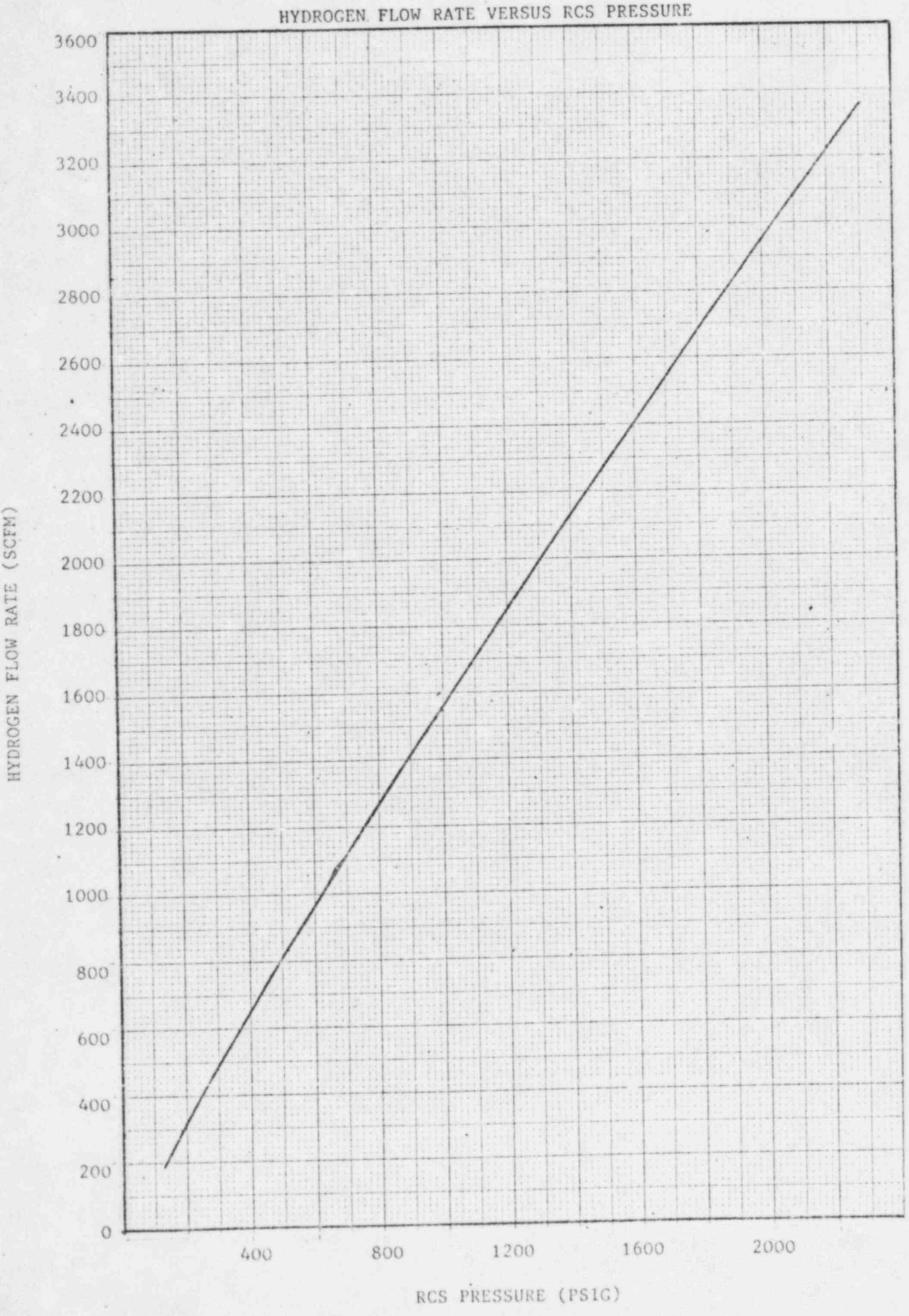
4.3.4 Determine hydrogen flow rate as a function of RCS pressure using Fig. TSC-7 = C (scfm)

C = _____ scfm

4.3.5 Calculate maximum venting time:

Maximum venting time = B/C = _____ min.

FIGURE TSC-7


HYDROGEN FLOW RATE VERSUS RCS PRESSURE
HYDROGEN FLOW RATE (SCFM)
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
400
800
1200
1600
2000
RCS PRESSURE (PSIG)