WISCONSIN PUBLIC SERVICE CORPORATION

Kewaunee Nuclear Power Plant

EMERGENCY PLAN IMPLEMENTING PROCEDURE

NO. EP-RET-3D REV. A

TITLE: Containment Air Sampling Analysis Using CASP

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1.0 PURPOSE

Containment samples will be drawn and analyzed following an Alert, Site, or General Emergency, or when directed by the Radiation Protection Director (RPD).

2.0 APPLICABILITY

2.1 This procedure is to detail the requirements, considerations, and operations of the Containment Air Sample Panel (C.A.S.P.) during a post LOCA condition, to obtain a grab sample of containment air for gross gas analysis, Iodine analysis, and oxygen analysis.

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.

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

GAS	5.0 Millicuries/cc
IODINE	0.2 Millicuries/cc

4.0 EQUIPMENT

All necessary equipment shall be on hand prior to beginning to sample the containment atmosphere. This equipment includes:

4.1 Operable C.A.S.P. System with ISC Cart in #1 Sample Station

4.2 A 5.0 microliter gas syringe (2)

4.3 a 1.0 cc gas syringe

4.4 An iodine cartridge holder (1)

4.5 Silver Zeolite Cartridges (1)

4.6 Several small rubber stoppers (3-4)

4.7 Portable shields for use when transporting syringes for counting.

4.8 A 4.0 liter Marinelli Beaker (in Count Room)

5.0 PROCEDURE

5.1 Containment Air Sample Panel Operation

5.1.1 Proceed to HRSR per HP/RPD recommendations.

5.1.2 Check ventilation on and in "normal" position and high vacuum lights indicate "normal" for the LSP and CAP, and CASP. Check valve lineup per Attachment 1.

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

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

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

5.1.6 Check the ISC sample cart in the #1 position and lock in place. Check cart is properly locked in by trying to pull away.

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

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

5.1.8 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

5.1.9 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.

5.1.10 CASP two minute pre-sample back flush

SV-10 OPEN
SV-6 OPEN
SV-5 OPEN

Insure flow monitor on CASP is indicating flow

5.1.11 Three minute sample purge:

AV-1/SV 1.2 Open
SV-5 Closed
AV-2 Open

Open manual inlet, (V-4) and outlet (V-6) valves and close manual bypass valve (V-5) on I.S.C. Insure CASP Flow Monitor is indicating flow.

5.2 Sample Collection

5.2.1 SV-6 Closed. Flow Monitor on CASP should go out. Wait 1 minute for pressure equalization.

5.2.2 Withdraw a one cc sample and two 5 microliter samples of the containment atmosphere from the I.S.C. and place them in a portable shield for transport to the count room. Insert the needle of each syringe into a small rubber stopper to prevent leakage.

5.2.3 Using a predetermined route to minimize personnel exposure, transport the shielded samples to the count room for analysis, after completing Step 5.3

5.3 System Shutdown and Cleanout

5.3.1 Shut AS110A or AS110B.

5.3.2 Open SV-6, to evacuate the I.S.C. cart for 2 minutes.

5.3.3 Shut I.S.C. cart inlet valve (V-4) and outlet valve V-5. Open bypass valves (V-6).

5.3.4 Open AS110A or AS110B and shut AV-2. Continue this backflush for 2 minutes. Flow monitor should indicate flow.

5.3.5 Open SV-5, shut AV-1/SV1.2. Continue this backflush for 1 minute. Flow monitor should indicate flow.

5.3.6 Shut SV-10, SV-6, SV-5, and AS110A or AS110B.

5.3.7 Call Control Room and have containment isolation valves selected in step 5.1.8 closed.

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

5.3.8 After cart is flushed, reset "Active/Inactive" indicator lights to Inactive mode.

5.4 Gross Gas Analysis

5.4.1 Perform background radiation surveys in the count room and ensure that the multi-channel analyzer (MCA) is operable.

5.4.2 Place a Marinelli beaker on the GeLi detector and run a 5 minute background count. Record the % dead time indication.

5.4.3 After the background count, remove the Marinelli from the count cave and inject 5 microliters of sample into it. Replace on the GeLi and count for one minute using the standard Marinelli Q>T table. Expected results are approximately 5.0 E - 3uCi/cc for Xe-133 at 5% dead time under negligible background radiation conditions.

5.4.4 Dilution factor when injecting 5.0 microliters into a 4.0 liter Marinelli is 8.0 E + 5. Determine gaseous isotopes using the following formula:

$$(\text{Printout Activity in uCi/cc}) \times (8.0\ E + 5) = \text{Gaseous Activity in Containment in uCi/cc}$$

5.4.5 If the count room is uninhabitable or if the multi-channel analyzer is saturated from background radiation and inoperable, the sample may have to be sent to Point Beach for counting. In this case, instead of injecting the 5.0 microliters of sample into a Marinelli beaker, inject it into a 1.0 liter poly bottle. The bottle may then be counted for gross gas activity at Point Beach in the liter bottle geometry. If this is done, use a dilution factor of 2.0 E + 5 to determine actual activity in containment.

5.5 Iodine Analysis

5.5.1 Place a Silver Zeolite sample cartridge in a holder. Attach a hose from the holder to a vacuum source and establish air flow through the filter cartridge.

5.5.2 Inject 5.0 microliters of the samples gas upstream of the filter cartridge allowing the gas to flow through the Silver Zeolite cartridge.

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

5.5.4 Insert the CESCO NFRU Q>T table on the MCA.

5.5.5 Run a 5 minute background count on the MCA.

5.5.6 Place the Silver Zeolite cartridge on the GeLi detector and perform a one minute sample count. Activity results will be in uCi/cc times 1.00 E-6.

5.5.7 If the count room is inaccessible, the cartridge may be sent to Point Beach for analysis. They use an identical geometry for counting iodine samples.

5.6 Hydrogen and Oxygen Analyses

5.6.1 Refer to chemistry procedure RC-C-61, Operation of the Gas Partitioner.

5.6.2 Ensure that the gas partitioner is turned on, the Argon flow is 30-35 cc/min., the cell power switch is on, and the heater switch and chart recorder are on.

5.6.3 Once everything is set up on the gas partitioner inject the contents of the 1.0 cc syringe into the gas partitioner and await results on the chart recorder.

5.6.4 Report all results obtained to the Radiological Protection Director.

VALVE LINEUP SHEET

CASP Control Panel

AV-1/SV-1.2	Smpl Pos #1	Inlet/Outlet	CLOSE
SV-2.1/SV-2.2	Smpl Pos #2	Inlet/Outlet	CLOSE
SV-3.1/SV-3.2	Smpl Pos #3	Inlet/Outlet	CLOSE
SV-4.1/SV-4.2	Smpl Pos #4	Inlet/Outlet	CLOSE
SV-5	Smpl Bypass		CLOSE
SV-10	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 Isol	CLOSE
AS110B	Cont Air Smpl B Isol	CLOSE