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AAA056

Op. Com. Rev. Req'd
Q.A. Review Req'd
ALARA Review Req'd

EMERGENCY SAMPLING AND ANALYS

A 2-xxx

Prepared by: [signature] ALARA Review [illegible] Date

Reviewed by: [signature] Q.A. Review: Revision Date

Operations Committee Final Review: Meeting Number: 1073 Date 3/xx/8x

Approved by: [signature] Date 5/3/8x

Op. Com. Results Review: Not Required Mtg. # 9xx Date 3/xx/8x

PURPOSE

The purpose of this procedure is to provide special instructions, precautions, and guidance for collection, handling and analysis of samples during and following an emergency at Monticello Nuclear Generating Plant.

CONDITIONS AND PREREQUISITES

Actual or potential radiological conditions are such that special methods and precautions are necessary in order to collect and analyze a large quantity of samples under conditions which may represent a much greater than normal radiation hazard to individuals performing the sampling and analyses. A RWP is required prior to using Attachments 1 through 5. Unless directed otherwise, these procedures should be used in lieu of routine sampling and analysis procedures whenever a Site Area Emergency or General Emergency is declared.

PRECAUTIONS

A. Exposures of sampling and analysis personnel shall be in accordance with A.2-401, "Emergency Exposure Control".

B. Exposures to all personnel due to sampling and analysis operations should be maintained as low as is reasonably achieveable. Techniques such as temporary shielding, remote handling and sample dilution prior to analysis should be considered to reduce exposure to personnel.

C. When actual or potential radiation levels so warrant, high range portable survey instruments, and self-reading dosimeters shall be provided to sampling and analysis personnel to permit rapid assessment of high exposure rates and accumulated personnel exposure. Alarming dosimeters should also be considered.

D. Appropriate extremity dosimeters should be provided and worn when handling samples which themselves represent high level radiation sources.

DISCUSSION

Emergency sampling operations shall be coordinated by the Radiological Emergency Coordinator. The Radiological Emergency Coordinator shall assume responsibility for authorizing emergency samples and should ensure that such operations are well-planned and executed in a radiologically safe manner. All sampling operations shall be coordinated with appropriate Control Room personnel and the Shift Supervisor shall be kept fully informed.

Emergency sampling and analysis operations (eg.; sampling undertaken during a declared emergency and under conditions which (1) may represent a much greater than normal radiation hazard to personnel or (2) may have an impact on plant operations or emergency response) shall be approved in detail by the Radiological Emergency Coordinator.

Emergency sampling and analyses shall be carried out in accordance with methods established in attachments to this procedure as follows (coordinate with Control Room as appropriate):

1. Reactor Coolant Sampling and Analysis - Attachment 1
2. Reactor Building Vents Charcoal - Particulate Sampling and Analysis - Attachment 2
3. Stack Charcoal - Particulate Sampling and Analysis - Attachment 3
4. Containment Atmosphere Sampling and Analysis - Attachment 4
5. Airborne Iodine Sampling and Analysis - Attachment 5
6. Emergency Sample and Measurement Considerations - Attachment 6

PROCEDURE

STEP 1: Go to Attachments 1 through 5, depending upon the type of sample requested.

STEP 2: Report all results and submit documentation to the Chemistry Section Leader or Radiological Emergency Coordinator.

NOTE: The attachments 1 through 6 are written for use only by experienced and knowledgeable plant personnel.

REFERENCES

1. MNGP Operations Manual, Section E.1
2. MNGP Plant Chemistry Manual and Procedures

WP/kk

ATTACHMENTS

1. Reactor Coolant Sampling and Analysis
2. Rea - Building Vents Charcoal - Particulate Sampling and Analysis
3. Stack Charcoal - Particulate Sampling and Analysis
4. Containment Atmosphere Sampling and Analysis
5. Airborne Iodine Sampling and Analysis
6. Emergency Sample and Measurement Considerations

Attachment 1
Page 1 of 3

REACTOR COOLANT SAMPLING AND ANALYSIS

Remarks

Refer to chemistry manual for sampling when ARM #7 reads ≤ 1 rem/hr. Prior to sampling notify the Control Room of your intentions.

PREREQUISITES

CAUTION: The following steps shall only be performed by an operator when specified by the Emergency Director. Refer to Attachment 6 prior to proceeding.

If a Group 1 isolation signal exists and cannot be reset, perform the following steps to open the recirc loop sample valves, CV-2790 and CV-2791.

1. Place the CV-2790 and CV-2791 handswitches to CLOSE.

2. At panel C04 jumper the following terminals:

   a. EE11 - EE13 (CV-2790)
   b. KK21 - KK22 (CV-2791)

3. Open the valves by placing the handswitches to AUTO/OPEN.

EQUIPMENT REQUIRED

Survey Meter
1 Liter poly bottles, in Hot Lab
1 ml. pipet and pipet bulb, in Hot Lab
Shielded Sample Container with Stop Watch

PROCEDURE

NOTE 1: Obtain Vital Key #211 from S.S. for emergency sample route.

NOTE 2: If the recirc sample line is isolated wait for about 25 minutes but no less than 15 minutes upon opening the recirc loop sample valves before sampling.

STEP 1: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics Group (RWP).

CAUTION: Extremely high dose rates may exist at the sample hood. It is important that travel to and from the sample hood as well as the actual obtaining of the sample be done as quickly and safely as possible.

STEP 2: Proceed to the reactor sample hood area as directed by the Emergency Director or his designee while observing Health Physics precautions.

STEP 3: Purge the reactor recirc sample line for one second. (If the reactor recirc sample point is inoperable, purge and obtain the sample from the RHR sample point.) Note coolant or RHR conductivity as applicable.

STEP 4: Fill a 4 ml. counting vial one-half full with sample from the sample point. Start the stop watch. Place the vial and sample in the lead shielded container.

STEP 5: Proceed to the Hot Lab. Place the sample behind lead bricks in the south hot lab hood. Record sample time and conductivity in the Emergency Sample Log, Form #5790.

NOTE 3: Measure dose rate from sample. If $\leq$ 10 millirem per hour continue to STEP 6. If $>$ 10 millirem per hour pipet 1 ml. of sample into a 100 ml. flask and fill to 100 ml. mark with D.I. water. Continue 1:100 dilutions until $\leq$ 10 millrem per hour Note number of dilutions, proceed to STEP 6.

STEP 6: From the undiluted or diluted sample, place 1 ml. into a 1 liter poly bottle containing 500 ml. of demin water. Dilute the mixture to 1 liter with demin water. Record the number of dilutions in the Reactor Coolant Sampling and Analysis Checklist.

STEP 7: Place the labeled 1 liter poly bottle in a poly bag and count on the GeLi System for $\leq$ 1000 seconds.

STEP 8: When the count is complete, run the GAMMAK program on the resulting spectrum.

STEP 9: Transcribe the conductivity data (if applicable) and dilution data, to the resulting computer printout sheet. Calculate the Iodine dose equivalent and total μCi/cc depending on the dilution factors required.

STEP 10: Refer to Chemistry Manual Volume I for additional analysis procedures if required.

Chloride - Procedure I.1.3
pH - Procedure I.1.34
Boron - Procedure I.1.40

STEP 11: Place the undiluted sample in the shielded in storage area. Flush the diluted, counted samples down the Hot Lab sink, using caution to minimize the total activity disposed in this manner.

STEP 12: Attach the sample results to the checklist and submit to Chemistry Section Leader or Radiological Emergency Coordinator.

WP/kk

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Attachment 1 - Page 3 of 4
Example of

REACTOR COOLANT SAMPLING AND ANALYSES CHECKLIST

1. Sample taken (time noted: ____ hrs, Date ____)
2. Sample and sample data to hot lab.
3. Sample diluted to one liter (dilution factors ____ x ____)
4. Spectrum collected.
5. Spectrum analyzed.
6. Activity calculated, results reported to the Chemistry Section Leader or to the Radiological Emergency Coordinator, (_____ µCi/cc).
7. Chloride Concentration _____
8. Boron Concentration _____
9. Conductivity _____
10. pH _____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

REACTOR BUILDING VENTS CHARCOAL - PARTICULATE SAMPLING AND ANALYSIS

Remarks

Prior to sampling, notify the control room of your intentions. Refer to Attachment 6 prior to proceeding.

Equipment Required

Survey Meter
R. B. Vents Sample Kit Consisting of:

- Charcoal and Particulate Filter Holder with filters installed
- Shielded filter holder container
- Pair of tongs (or other remote handling device as appropriate)

Procedure

NOTE 1: Obtain Vital Access key #211 and key #145 from S.S. for emergency sample route.

STEP 1: Verify that the hood exhaust is functioning (use small piece of paper to check air flow) if not, contact Radiological Emergency Director and continue.

STEP 2: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics Group (RWP).

STEP 3: Proceed to the Reactor Building vents sample area as directed by the Emergency Director or his designee while observing Health Physics precautions.

CAUTION: During filter holder changeout monitor radiation levels to ensure levels are below 200 mR/hour. If levels are above 200 mR/hour, use remote handling device to minimize exposure.

STEP 4 Shut the isolation valve for a Charcoal-Particulate Filter Holder Set. Replace the installed filter holder set with the fresh filter holder set. Note time of sample and process flow of the plenums

NOTE: Be sure to sample from a filter set which is from a plenum with a dilution fan in service.

STEP 5 Open the isolation valve previously shut. Place the sample filter holder set into the shielded container.

STEP 6: Proceed to the Hot Lab and place the filter set and shielded container into the south hood.

STEP 7: Connect the sample filter holder to the purge air fitting in south hood of hot lab. Open fully the plant air supply valve in the hood and purge the filter holder set into the hood for about 2-3 minutes.

STEP 8 Remove the charcoal filter from the charcoal filter holder from behind the lead bricks.

STEP 9: Measure the contact dose rate from the charcoal filter. If $\leq$ 10 mR/hr proceed to STEP 12.

STEP 10 If $\geq$ 10mR/hr at contact then measure the dose rate at 1 foot. Apply a factor of 420 µCi/mR/hr. By using the sample volume, calculate the µCi/cc as I-131. Calculate the release rate via the R.B. vents in µCi/sec. I-131 assuming a 120,000 CFM vents flow. Proceed to STEP 13.

* Use 120,000 CFM if flow rate indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

STEP 11: Place the charcoal filter into a labeled poly bag and count on the GeLi System for $\leq$ 1000 seconds.

STEP 12: When the count is complete, run the GAMMAK Program on the resulting spectrum. Run the SAVCAL Program to get the iodine release rate via the R.B. vents (use 120,000 CFM vents flow).

* Use 120,000 CFM unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case flow rate based on actual readings should be used.

STEP 13: Place the charcoal filter into the shielded storage area.

STEP 14: Place the particulate filter in a labeled petri dish.

STEP 15: Measure the contact dose rate of the petri dish and filter. If $\leq$ 10 mR/hr proceed to STEP 17.

STEP 16: If the measured dose rate is $\geq$ 10 mR/hr, measure the dose rate of the petri dish and filter at one foot. Apply a factor of 610 µCi/mR/hr and calculate the release rate via the R.B. vents in µCi/sec.* Proceed to STEP 18.

* Use 120,000 CFM unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

STEP 17: Place the particulate filter in a labeled petri dish and count on the Ge(Li) system for $\leq$ 1000 seconds. When the count is complete, run the GAMMAX Program on the spectrum.

STEP 18: Run the PART Program to obtain the release rate for particulates from the RB vents (use 120,000 CFM vent flow).

* Use 120,000 cfm unless the flow indicators on 1027' Rx Bldg are inaccessible, in which case the flow rate based on actual readings should be used.

STEP 19: Place the sample into the shielded container in the sample storage area.

STEP 20: Provide the release rate information to the Radiological Emergency Coordinator and submit the chekslist to the Chemistry Section Leader or Radiological Emergency Coordinator.

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Revision 2, 3/30/82
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Example of

REACTOR BUILDING VENTS CHARCOAL-PARTICULATE ANALYSIS CHECKLIST

		Initial
1.	Hot lab hood readied.	_____
2.	Protective clothing and dosimetry.	_____
3.	Replaced filter set. (Time Noted _____ hrs, Date _____)	_____
4.	Sample to hot lab and purged.	_____
5.	If charcoal filter ≤ 10 mR/hr; ran spectrum.	_____
	If > 10 mR/hr (calculated activity = _____ µCi/cc) (= dose rate x 420 µCi/mR/hr).	_____
6.	Analyze spectrum, calculate release rate. (Iodine release rate _____ µCi/sec.)	_____
7.	If particulate filter ≤ 10 mr/hr; collect spectrum. If > 10 mr/hr, (calculated activity = _____ µCi/cc) (= dose rate x 610 µCi/mr/hr)	_____
8.	Particulate Spectrum ran.	_____
9.	Analyze spectrum, calculate release rate. (Particulate release rate _____ µCi/sec.)	_____
10.	Provided results to Radiological Emergency Coordinator or Chemistry Section Leader.	_____

Performed by: _____ Date: _____

Reviewed by: CSL or REC _____ Date: _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

STACK CHARCOAL - PARTICULATE SAMPLING AND ANALYSIS

Remarks

Prior to sampling, notify the Control Room of your intentions. Refer to Attachment 6 prior to proceeding.

Equipment Required

Survey Meter
Pair of tongs (or other remote handling device as appropriate)
Filter set with filters loaded if one set already removed

Procedure

NOTE 1: Obtain key #9 from R.P. Coord. to access stack.

STEP 1: Verify that the Hot Lab South hood exhaust is functioning (use small piece of paper to check air flow), if not contact Radiological Emergency Director and continue.

STEP 2: Go to the Control Room and set the timer on Stack Wide Range Gas Monitor Channel "A" according to the following chart. Note process flow item 029 and use the non-zero sample flow itesm 028 or 033)

Activity	Timer Setting
<1E4 µCi/sec	5 minutes
>1E4 µCi/sec <1E5 µCi/sec	90 seconds
>1E5 µCi/sec <1E6 µCi/sec	30 seconds
>1E6 µCi/sec	10 seconds

STEP 3: Don all protective clothing, equipment and dosimetry devices as required by the OSC Coordinator.

STEP 4: Proceed to the stack sample area as directed by the Emergency Director or his designee while observing Health Physics precautions.

STEP 5 Close the four valves on the Grab Sample Filter apparatus. Disconnect and remove the Grab Sample filter holder. Replace previous set if already removed.

CAUTION: During filter holder changeout monitor radiation levels to ensure levels are below 200 mR/hour. If levels are above 200 mR/hr, use remote handling device to minimize exposure.

STEP 6: Proceed to the hot lab and place the filter set into the south hood

STEP 7: Connect the sample filter holder to the purge air fitting [illegible] south hood of hot lab. Open fully the plant air supply valve in the hood and purge the filter holder set into the hood for about 2-3 minutes. If instrument air is not available, use compressed air from the yellow bottle that is located in the Hot Lab

STEP 8: Measure the contact dose rate from the charcoal filter. If $\leq$ 10 mR/hr proceed to STEP 10.

STEP 9: If $\geq$ 10 mR/hr at contact then measure the dose rate at 1 foot. Apply a factor of 420 µCi/mR/hr. Calculate the µCi/cc as I-131. Proceed to STEP 11.

STEP 10: Place the charcoal filter into a labeled poly bag and count on the Ge(Li) System for $\leq$ 1000 seconds. When the count is complete, run the GAMMAK Program on the resulting spectrum

STEP 11: Calculate the iodine release rate via the stack. (Use a sample flow of .06 cfm low flow or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.)

STEP 12: Place the charcoal filter into the shielded storage area

STEP 13: Place the particulate filter in a labeled petri dish.

STEP 14: Measure the contact dose rate of the petri dish and filter. If $\leq$ 10 mR/hr, proceed to STEP 16.

STEP 15: If the measured dose rate is $\geq$ 10 mR/hr measure the dose rate of the petri dish and filter at one foot. Apply a factor of 610 µCi/mR/hr and calculate the particulates release rate via the stack in µCi/sec. (Use a sample flow of .06 cfm low flow or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.) Proceed to STEP 17.

STEP 16: Place the particulate filter in a labeled petri dish and count on the Ge(Li) System for $\leq$ 1000 seconds. When the count is complete, run a GAMMAK Program on the resulting spectrum.

STEP 17: Calculate the release rate for particulates from the stack. (Use a sample flow of .06 cfm or 1.6 cfm high flow and a process flow of 4300 cfm if WRGM inoperative.)

STEP 18: Place the sample into the shielded storage area

STEP 19: Provide the release rate information [illegible] Coordinator and submit the checklist [illegible] or Radiological Emergency Coordinator.

STEP 20: Install fresh silver zeolite cartridge and particulate filter holder.

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Attachment 3 - Page 4 of 4
Example of

STACK CHARCOAL-PARTICULATE ANALYSIS CHECKLIST

		Initial
1.	Hot lab hood readied.	_____
2.	Grab Sample Timer set _____ min/sec.	_____
3.	Protective clothing and dosimetry.	_____
4.	Removed filter set. Time Noted (_____ hrs, Date: _____)	_____
5.	Sample to hot lab and purged.	_____
6.	If charcoal filter $\leq$ 10 mR/hr, ran spectrum.	_____
	If $>$ 10 mR/hr after one hour, calculated activity (_____ µCi/cc) (= dose rate x 420 µCi/mR/hr).	_____
7.	Analyze spectrum, calculate release rate. (Iodine release rate _____ µCi/sec.)	_____
8.	If particulate filter $\leq$ 10 mr/hr; collect spectrum. If $\geq$ 10 mr/hr, (calculated activity = _____ µCi/cc) (= dose rate x 610 µCi/mr/hr).	_____
9.	Ran Spectrum on particulate filter.	_____
10.	Analyze spectrum, calculate release rate. (Particulate release rate _____ µCi/sec.)	_____
11.	Provided results for Chemistry Section Leader or Radiological Emergency Coordinator.	_____

Performed by: _____ Date _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

Attachment 4
Page 1 of 4

CONTAINMENT ATMOSPHERE SAMPLING AND ANALYSIS

Prerequisites

If a Group 2 isolation signal exists and cannot be reset, perform the following steps to open the sample isolation valves CV-3307 and CV-3308 and the sample return isolation valves CV-3313 and CV-3314.

The following steps shall only be performed by an operator when specified by the Emergency Director.

1. Place the handswitches at panel C26 for the following valves to CLOSE.

CV-3307	CV-3311	CV-3313
CV-3308	CV-3312	CV-3314

2. Isolate the drywell CAM by closing DWV-33, DWV-34 and DWV-38.

3. At panel C26, lift and tape the external wires at the following terminals

   a. Q530/1
   b. Q528/1

4. At panel C26, jumper the following terminals:

   a. Q530/X1 - Q530/1
   b. Q528/X1- Q528/1

5. Open sample isolation valves CV-3307, CV-3308 and sample return valves CV-3313 and CV-3314 by placing the handswitches to AUTO/OPEN.

Remarks

Prior to sampling, notify the OSC and Control Room of your intention and turn on gas chromatograph per Chemistry Procedure I.1.36.

Equipment Required

Containment Emergency Sampling Kit (stored in Access Control) Consisting of

1 - 15 cc sample vial with septums
1 - Gas syringe with needle and valve
1 - sampling apparatus (tubing with fittings and quick disconnects)
1 - shielded sample holder

CAUTION

Refer to Attachment 6 prior to proceeding

PROCEDURE

NOTE 1: Obtain key #45 from S.S.

STEP 1: Evacuate a 15 cc sample vial and label as vial #1

STEP 2: Don all protective clothing, equipment and dosimetry devices as required by the Health Physics group (RWP).

STEP 3: Proceed to the containment atmosphere sample area as directed by the Radiation Emergency Coordinator or his designee while observing Health Physics Precautions.

STEP 4: Connect the sampling apparatus to the gas sample points.

STEP 5: Open valves DWV-18-2 and DWV-18-5.

STEP 6: Start pump P-89 check flow. Immediately retire to R.W. control room and wait for about 5 minutes.

NOTE: If there is a loss of power to the pump evacuate the area immediately.

STEP 7: Return to sample area and insert the syringe needle through the septum located in the center fitting of the apparatus and withdraw 1 cc of gas.

STEP 8: Inject the gas into the evacuated 15 cc sample vial. Note the time of sample.

STEP 9: Stop pump P-89, shut valves DWV-18-2 and DWV-18-5.

STEP 10: Place the sample vial in the shielded sample holder and proceed to the Hot Lab.

STEP 11: Record the date and time of sample on the Containment Atmosphere Analyses Checklist.

STEP 12: Measure the dose rate of the sample vial at contact. If $\leq$ 10 mR/hr proceed to STEP 14.

STEP 13: If the dose rate is $\geq$ 10 mR/hr evacuate another 15 cc gas vial. Remove 1 cc of gas sample and inject into the evacuated 15 cc gas vial. Label the new sample vial as appropriate and repeat STEP 12.

STEP 14: Place the sample in a poly bag and count on the Ge(Li) System for ≤ 1000 seconds.

STEP 15: When the count is complete, run the GAMMAK Program on the resulting spectrum. Calculate the μCi/cc depending on the dilution factors.

STEP 16 If requested by Chemistry Section Leader complete Chemistry Manual, Volume I, Procedure I.1.36 to determine the percent hydrogen, oxygen and nitrogen in containment atmosphere.

STEP 17: Transcribe all pertinent sample data from the Containment Atmosphere Checklist to the spectrum analysis computer printout sheet

STEP 18: Place the sample(s) into the shielded container in the Sample Storage Area.

STEP 19: Provide sample results to Radiological Emergency Coordinator, and submit checklist to Chemistry Section Leader and Radiological Emergency Coordinator.

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Attachment 4 - Page 1 of 1
Example 1

CONTAINMENT ATMOSPHERE ANALYSIS RECORD

1. Evacuated sample vial.

2. One cc sample taken, time noted
(_____ hours, Date ___ / ___ / ___)

3. If sample vial ≤ 1 mR/hr, ran spectrum
If > 10 mR/hr, diluted sample
(dilution factor = 1 X _____), ran spectrum

4. Results of GAMMAK (adjusted for dilutions)
(_____ μCi/cc).

5. Report results to Chemistry Section Leader or
Radiological Emergency Coordinator.

6. % Hydrogen, Oxygen and Nitrogen ___% H_2 ___% O_2 ___% N_2
(Chem. Manual Procedure 1.1.36)

Performed by: _____ Date: _____

Reviewed by: CSL or REC _____ Date _____

NOTE: After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided for Emergency Records.

WP/kk

AIRBORNE IODINE SAMPLING AND ANALYSIS

PREREQUISITES

Determine if entry can be made into the required sample area, allowing sufficient time to obtain both types of samples, without exceeding established exposure limits.

Adequate radiological precautions specified for this work

PERSONNEL REQUIRED

2 Radiation Protection Specialists (RPS)
Radiological Emergency Coordinator

EQUIPMENT REQUIRED

Radgun or equivalent
0-10R dosimeter
Radeco portable battery powered air sampler
Silver zeolite filters
Particulate filters
Protective Clothing
Scott Air Pak
Stopwatch
15 ml. off-gas sample vials
Needle

NOTE: All above equipment, except the Scott Air Paks, is located in the Access Control Emergency Cabinet. The Scott Air Paks are mounted on the wall in Access Control.

PROCEDURE #1

STEP 1: If there is any chance the particulate/silver zeolite sample will be too "hot" to count, a gas vial sample should also be drawn. If no gas vial sample will be taken, simply disregard those portions of this procedure. Obtain direction from the Radiological Emergency Coordinator or the Monitoring Section Leader as to whether or not both types of samples should be taken.

STEP 2: Load the sampler with a silver zeolite and particulate filter.

STEP 3: Turn Radgun on to allow warmup.

STEP 4: Cap the vial and evacuate it using the tygon tubing with needle attached and the hot lab vacuum pump. To the extent which is practical, bag the vial so as to minimize external contamination.

STEP 5: Don protective clothing, proper dosimetry and Scott Air Pak as required.

STEP 6: Proceed to determined entryway to sample area. Check the dose rate through the door. If it is determined that the dose rates are low enough to allow entry a short way into the building without exceeding established exposure limits, proceed to STEP 7; if not, contact the Radiological Emergency Coordinator for further instructions.

STEP 7: Proceed to the sample area by the shortest route possible. (If actual dose rates indicate that whole body dose received will exceed estimate, return to Access Control immediately.)

STEP 8: Run sampler for an appropriate length of time, but no shorter than 15 seconds. (Keep track of time with stopwatch.)

STEP 9: Puncture the vial cap with the needle and allow the vial to fill with room air. (Allow about 2 seconds to fill.)

STEP 10: Return to access control with the samples.

STEP 11: Open sampler head and check dose rate of silver zeolite sample.

STEP 12: If the dose rate is $\leq$ 10 mR/hr, bag the sample and count it on the Ge(Li) System using normal count room procedures for counting air samples.

STEP 13: If the silver zeolite filter dose rate is $\geq$ 10 mR/hr, unbag, then rebag the vial and count it on GeLi System using GAMMAK Program.

STEP 14: From the GAMMAK results, calculate the MPC ratio for each iodine listed below.

$$\text{Ratio} = \frac{\text{Concentration From GAMMAK}}{\text{MPC of Isotope}}$$

Isotope	MPC
I-131	9×10^{-9}
I-132	2×10^{-7}
I-133	3×10^{-8}
I-134	5×10^{-7}
I-135	1×10^{-7}

STEP 15: Report results to Radiological Emergency Coordinator or Monitoring Section Leader.

STEP 16: Save the particulate, silver zeolite and gas vial samples, in case later analysis is desired.

WP/kk

Form 5790-404-5
Revision 2, 02/28/82
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Example of

AIRBORNE IODINE ANALYSIS PROCEDURE #1 CHECKLIST

Initials

1. **Radgun, protective clothing, dosimetry, Scott Air Pak evacuated sample vial and sampler readied.** _____

2. **Samples taken, filter sample time noted (____ sec.) (flow rate for sampler _____ CFM).** _____

3. **If filter ≤ 10 mR/hr, ran spectrum (MPRAIR) (Activity _____ μCi/cc).** _____

4. **If silver zeolite sample > 10 mR/hr, GAMMAK Program ran on vial, and ratios calculated for:**

   (I-131 _____)

   (I-132 _____)

   (I-133 _____)

   (I-134 _____)

   (I-135 _____) _____

Performed by: _____ **Date:** _____

Reviewed by: _____ **Date:** _____
REC or MSL

NOTE: **After this checklist is completed and is not required for immediate use, it shall be placed in the appropriate container provided in Emergency Records.**

WP/kk

EMERGENCY SAMPLE AND MEASUREMENT CONSIDERATIONS

INTRODUCTION

In the event of certain postulated accidents, it is possible that effluent release rates would exceed the upper limits of installed monitors and that access to normal sample points for effluents, coolant and containment atmosphere may be encumbered by extremely high radiation fields. The purpose of this guidance is to preclude any unnecessary exposure resulting from the execution of such emergency sample and measurement activities.

SAMPLING PLENUM EFFLUENT

Plenum effluent is sampled on the 1027' level of the reactor building. Two matters to be considered are the route to the sample point and how to handle the sample filters.

The problem of getting to 1027' reduces to a problem of getting to the 985' level, above which radiation levels are tolerable. From calculations, it seems that the best way to approach is to enter secondary containment via the M.G. Set Room on 962'. From the air lock on 962', it is important to move as quickly as possible to the stairs in the northeast corner and to climb as fast as possible to the next level, 985'. Continue up the northeast stairs to the 1001' level and from there on the radiation levels permit a slower pace. Cross to the south side of the building through the fuel pool surge tank room and then climb to 1027' on the southwest stairs.

The filters could be a problem if removed from the filter holder and handled directly. We do not expect the whole body dose rate to be significant compared to levels encountered enroute to and from the sample stations. Precautions should be taken, however, after exiting containment.

SAMPLING PRIMARY CONTAINMENT ATMOSPHERE

The containment atmosphere sampling station is located on the [illegible] 935' level. The most efficient route is an outside route to the [illegible] ing. (CAUTION: There may be a very high field emanating from the [illegible] road access.) Make a cautious approach to the air lock leading to [illegible] containment. Radiation fields may preclude closer approach to sample [illegible] any point. If conditions in the air lock permit a closer approach, realize [illegible] radiation levels will increase all along the way. Before entering the [illegible] know at what level you will decide to turn back. There is no place [illegible] containment. Make sure your return to the radwaste building is unencumbered [illegible] security devices or interlocks on the air lock.

SAMPLING PRIMARY CONTAINMENT

The procedure for sampling primary coolant provokes many considerations. [illegible] route to and from the sample station, status of sample points and the sample [illegible] itself demand forethought.

The route to the sample hood on 985' is essentially the same as that [illegible] reach the plenum sample point. The difference is that on the 985' level, [illegible] proceed to the sample hood via a route which cuts between the first two heat [illegible] exchangers encountered.

The sample loop status must be considered before hand because an alternate [illegible] point may have to be used, depending on which systems are operating and which [illegible] are isolated. If the sampling is going to require some manual valving or you [illegible] are going to be present while remote valving is executed, be aware of possible [illegible] drastic changes in radiation levels.

The sample should be representative and consist of the minimum volume required. [illegible] Every precaution must be taken with this sample. Dose rates could be significant [illegible] even in the containment building.

WP/kk