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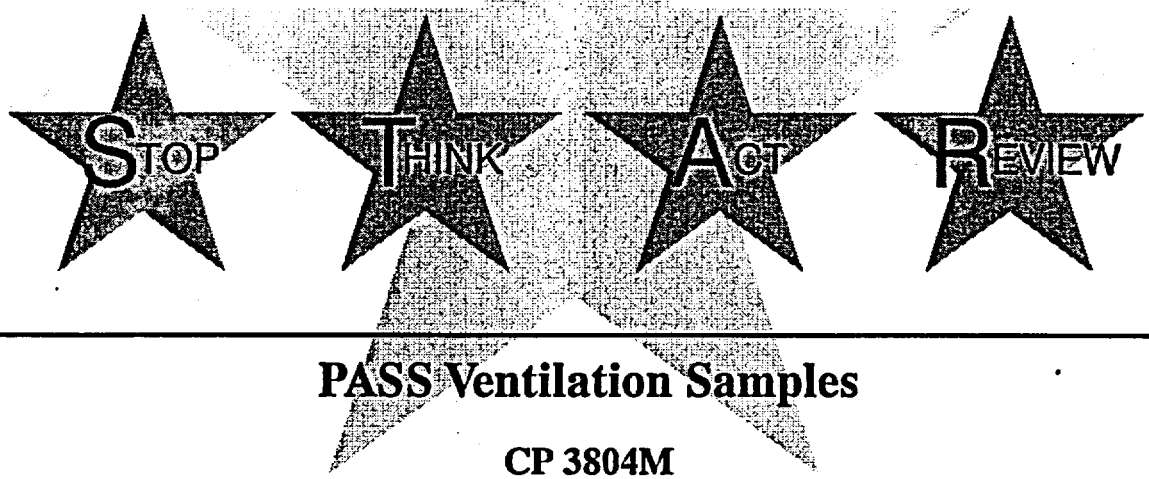
MILLSTONE NUCLEAR POWER STATION
CHEMISTRY PROCEDURE



PASS Ventilation Samples

CP 3804M

Rev. 1

NOTE

A review by the Emergency Planning Department is required whenever this procedure is revised or whenever changes are made to this procedure which impact the ability to collect and analyze a PASS sample.

Approval Date: 1/14/00

Effective Date: 1/17/00

Level of Use
Continuous

Millstone Unit 3
Chemistry Procedure

PASS Ventilation Samples

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1. PURPOSE

1.1 Objective

Provide instructions for sample acquisition and analysis from the Unit 3 ventilation system during Station Emergency Response Organization (SERO) activation when high radioactivity levels, due to an accident, may preclude the normal (conventional) sampling method.

This procedure partially satisfies the requirements listed in Unit 3 Technical Specification 6.8.4 d.

1.2 Discussion

The time required to collect and analyze samples should be 3 hours or less from the time the ADTS makes the decision to obtain a sample using PASS.

Sections 4.1, 4.2, and 4.3 are distinct sections that may be performed independently of each other. Section 4.4 is completed following completion of Sections 4.1, 4.2, or 4.3.

Sections 4.5, 4.6, 4.7, 4.8, and 4.9 are distinct sections that may be performed independently of each other. Section 4.10 is completed following completion of Sections 4.5, 4.6, 4.7, 4.8, or 4.9.

1.3 Applicability

This procedure is applicable during SERO activation when in-plant radioactivity levels are too high to permit ventilation sampling via the normal (conventional) method.

1.4 Frequency

Performance of this procedure may be repeated periodically during SERO activation, when requested by the MRDA or the AMRDA.

2. PREREQUISITES

2.1 General

___/___ 2.1.1 SERO is activated.

___/___ 2.1.2 MCRO has been notified that ventilation samples will be taken.

___/___ 2.1.3 Health Physics has been notified that ventilation samples will be taken.

/ 2.1.4 Health Physics has evaluated need for RWP.

/ 2.1.5 Lead brick shielding has been stacked at lab ventilation hood (3 brick tall rectangle, 2 bricks on each side, 24 bricks total)

/ 2.1.6 Computer radioisotopic analysis system in operation and calibrated.

/ 2.1.7 Manager of Radiological Dose Assessment (MRDA) or the Assistant Manager of Radiological Dose Assessment (AMRDA) has requested ventilation samples to include the following:

Check Requested Analysis

3HVR*RE10

☐ Gas isotopic

3HVR*RE10A (High Range)

☐ Iodine and particulate

3HVR*RE10B (Normal)

☐ Iodine and particulate

3HVR*RE19

☐ Gas isotopic

3HVR*RE19A (High Range)

☐ Iodine and particulate

3HVR*RE19B (Normal)

☐ Iodine and particulate

3HVQ–RE49

☐ Gas isotopic

☐ Iodine and particulate

2.1.8 Ventilation PASS Team has completed pre–job brief as follows:

/ • Manager of Operational Support Center (MOSC) – designates, assembles, and briefs the Ventilation PASS Team for implementation of this procedure

/ • Operational Support Center Assistant Radiological Protection Supervisor (OSC ARPS) with the concurrence of the Manager of Radiological Consequence Assessment (MRCA) – specifies the radiological controls required for implementation of this procedure

2.2 Documents

2.2.1 RWP for PASS sample collection (If Health Physics determines is necessary).

2.2.2 CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation"

2.2.3 SP 3867 (Att), "3HVR*RE10B and 3HVQ–RE49 Daily Average Logsheet"

2.3 Personnel

2.3.1 Manager of Radiological Dose Assessment (MRDA)

2.3.2 Assistant Manager of Radiological Dose Assessment (AMRDA)

2.3.3 Manager of Radiological Consequence Assessment (MRCA)

2.3.4 Manager of Operational Support Center (MOSC)

2.3.5 Operational Support Center Assistant Radiological Protection Supervisor (OSC ARPS)

2.3.6 Manager of Control Room Operations (MCRO)

2.3.7 Ventilation PASS Team consisting of at least the following personnel:

- At least one Chemistry Technician
- At least one Health Physics Technician

2.4 Tools and Consumables

- PASS transport cart
- Shielded transport container
- Sample bucket with lid
- KERIC control unit key
- Plastic bags with labels
- Silver zeolite cartridges
- Particulate filters
- Cartridge holders
- Mechanical fingers
- Reach rod
- Gas flask with septum and isolation stopcocks
- 14.4 ml gas vials
- 14.4 ml gas vial stoppers
- 5 cc gas syringe
- Filter holder (for blowing out noble gases in lab hood)
- Sample tubing

2.5 Definitions

2.5.1 SLCRS – supplementary leak collection and release system

2.5.2 CR – Condition Report

3. PRECAUTIONS

3.1 The sample system particulate filters and iodine cartridges may be highly radioactive resulting in high radiation levels in the vicinity of the ventilation monitor. If radiation levels are greater than 1 R/hr, notify the MRDA or the AMRDA and wait for instructions.

3.2 Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- Gas or particulate channel reading (where available)
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ−RE49)
- Difficulty in moving shielded transport container versus sample bucket

4. INSTRUCTIONS

4.1 3HVR*RE10 Gas Sample Collection

_____ 4.1.1 NOTIFY MCRO that a 3HVR*RE10 gas sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- 3HVR*RE10B gas channel reading
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ–RE49)
- Difficulty in moving shielded transport container versus sample bucket

_____ 4.1.2 PROCEED to Radiation Monitor 3HVR*RE10 with the following:

- 5 cc gas syringe
- Stoppered and evacuated 14.4 ml gas vial
- Gas flask with septum and isolation stopcocks
- Sample bucket with lid or shielded transport container

4.1.3 REMOVE caps and INSTALL sample tubing on the following valves:

_____ • 3HVR–V847, RE 10B sample test connection

_____ • 3HVR–V849, RE 10B test sample connection isolation valve

4.1.4 Using sample tubing, CONNECT the following points:

_____ • 3HVR–V847, RE 10B sample test connection, to one end of gas flask

_____ • Other end of gas flask to temporary sample pump suction

_____ • Temporary sample pump discharge to 3HVR–V849, RE 10B test sample connection isolation valve

4.1.5 OPEN the following valves:

_____ • Both gas flask stopcocks

_____ • 3HVR–V847, RE 10B sample test connection

_____ • 3HVR–V849, RE 10B test sample connection isolation valve

_____ 4.1.6 Using switch on side of temporary sample pump cabinet, ENERGIZE cabinet.

_____ 4.1.7 START temporary sample pump and ADJUST flow rate to one of the following ranges:

- 28 to 42 lpm
- 1 to 1.5 cfm

_____ 4.1.8 WAIT at least 30 seconds.

4.1.9 SECURE sampling as follows:

_____ a. STOP temporary sample pump.

_____ b. Using switch on side of temporary sample pump cabinet, DE–ENERGIZE cabinet.

_____ c. CLOSE the following valves:

- Both gas flask stopcocks
- 3HVR–V847, RE 10B sample test connection
- 3HVR–V849, RE 10B test sample connection isolation valve

d. RECORD 3HVR*RE10 sample date and time on Attachment 1.

4.1.10 Using gas syringe, DRAW 5 cc from gas flask.

4.1.11 LOCK sample in syringe and REMOVE from gas flask.

4.1.12 INJECT needle into stoppered 14.4 ml gas vial.

4.1.13 UNLOCK syringe and INJECT contents into stoppered 14.4 ml gas vial.

4.1.14 PLACE gas vial and syringe in one of the following:

- Sample bucket with lid
- Shielded transport container

4.1.15 IF 3HVR*RE19 gas isotopic sample was also requested in step 2.1.7 AND it desired to collect it at this time, Go To Section 4.2 and COLLECT sample.

4.1.16 TRANSPORT sample to lab.

4.1.17 Go To Section 4.4.

– End of Section 4.1 –

4.2 3HVR*RE19 Gas Sample Collection

4.2.1 NOTIFY MCRO that a 3HVR*RE19 gas sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- 3HVR*RE19B gas channel reading
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ–RE49)
- Difficulty in moving shielded transport container versus sample bucket

4.2.2 PROCEED to Radiation Monitor 3HVR*RE19 with the following:

- 5 cc gas syringe
- Stoppered and evacuated 14.4 ml gas vial
- 3HVR*RE19 sample tubing
- Gas flask with septum and isolation stopcocks
- Sample bucket with lid or shielded transport container

4.2.3 REMOVE caps and INSTALL sample tubing on the following valves:

- 3HVR*V162, RE19B sample test connection isolation valve
- 3HVR*V850, RE19B test sample connection isolation valve

4.2.4 Using sample tubing, CONNECT the following points:

- 3HVR−V162, RE19B sample test connection isolation valve, to one end of gas flask
- Other end of gas flask to temporary sample pump suction
- Temporary sample pump discharge to 3HVR*V850, RE19B sample test connection isolation valve

4.2.5 OPEN the following valves:

- Both gas flask stopcocks
- 3HVR*V162, RE19B sample test connection isolation valve
- 3HVR*V850, RE19B test sample connection isolation valve

4.2.6 START temporary sample pump and ADJUST flow rate to one of the following ranges:

- 28 to 42 lpm
- 1 to 1.5 cfm

4.2.7 WAIT at least 30 seconds.

4.2.8 SECURE sampling as follows:

a. STOP temporary sample pump.

b. CLOSE the following valves:

- Both gas flask stopcocks
- 3HVR*V162, RE19B sample test connection isolation valve
- 3HVR*V850, RE19B test sample connection isolation valve

c. RECORD 3HVR*RE19 sample date and time on Attachment 2.

4.2.9 Using gas syringe, DRAW 5 cc from gas flask.

4.2.10 LOCK sample in syringe and REMOVE from gas flask.

4.2.11 INJECT needle into stoppered 14.4 ml gas vial.

4.2.12 UNLOCK syringe and INJECT contents into stoppered 14.4 ml gas vial.

4.2.13 PLACE gas vial and syringe in one of the following:

- Sample bucket with lid
- Shielded transport container

4.2.14 IF 3HVR*RE10 gas isotopic sample was requested in step 2.1.7 AND it desired to collect it at this time, Go To Section 4.1 and COLLECT sample.

4.2.15 TRANSPORT sample to lab.

4.2.16 Go To Section 4.4.

– End of Section 4.2 –

4.3 3HVQ–RE49 Gas Sample Collection

4.3.1 NOTIFY MCRO that a 3HVQ–RE49 gas sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- 3HVQ–RE49 gas channel reading
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ–RE49)
- Difficulty in moving shielded transport container versus sample bucket

4.3.2 PROCEED to Radiation Monitor 3HVQ–RE49 with the following:

- 5 cc gas syringe
- Stoppered and evacuated 14.4 ml gas vial
- Gas flask with septum and isolation stopcocks
- Sample bucket with lid or shielded transport container

4.3.3 REMOVE caps and INSTALL sample tubing on the following valves:

- 3HVQ–V2041, RE49 inlet sample isolation
- 3HVQ–V2040, RE49 outlet sample isolation

4.3.4 Using sample tubing, CONNECT the following points:

- 3HVQ–V2041, RE49 inlet sample isolation, to one end of gas flask
- Other end of gas flask to temporary sample pump suction
- Temporary sample pump discharge to 3HVQ–V2040, RE49 outlet sample isolation

4.3.5 OPEN the following valves:

- Both gas flask stopcocks
- 3HVQ–V2041, RE49 inlet sample isolation
- 3HVQ–V2040, RE49 outlet sample isolation

4.3.6 Using switch on side of temporary sample pump cabinet, ENERGIZE cabinet.

4.3.7 START temporary sample pump and ADJUST flow rate to one of the following ranges:

- 28 to 42 lpm
- 1 to 1.5 cfm

4.3.8 WAIT at least 30 seconds.

4.3.9 SECURE sampling as follows:

a. STOP temporary sample pump.

b. Using switch on side of temporary sample pump cabinet, DE–ENERGIZE cabinet.

c. CLOSE the following valves:

- Both gas flask stopcocks
- 3HVQ–V2041, RE49 inlet sample isolation
- 3HVQ–V2040, RE49 outlet sample isolation

d. RECORD 3HVQ–RE49 sample date and time on Attachment 3.

4.3.10 Using gas syringe, DRAW 5 cc from gas flask.

4.3.11 LOCK sample in syringe and REMOVE from gas flask.

4.3.12 INJECT needle into stoppered 14.4 ml gas vial.

4.3.13 UNLOCK syringe and INJECT contents into stoppered 14.4 ml gas vial.

4.3.14 PLACE gas vial and syringe in one of the following:

- Sample bucket with lid
- Shielded transport container

4.3.15 TRANSPORT sample to lab.

4.3.16 Go To Section 4.4.

– End of Section 4.3 –

4.4 **Gas Sample Analysis**

_____ 4.4.1 PLACE empty syringe in labeled plastic bag and SEAL bag.

_____ 4.4.2 PLACE sealed plastic bag in shielded location.

_____ 4.4.3 PLACE 2.5 cm shelf in detector to be used for gas isotopic analysis.

4.4.4 DETERMINE gas isotopic activity as follows:

_____ a. Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and ANALYZE gas sample:

- Open cave
- Applicable geometry for shelf being used
- Five minute count time
- General library
- 5 cc sample volume
- Sample date and time as recorded on applicable Attachment

_____ b. IF dead time is greater than or equal to 20%, PERFORM the following:

1) ABORT count.

2) REPLACE shelf with next higher shelf.

3) Go To step 4.4.4 a.

_____ c. STORE stoppered 14.4 ml gas vial in shielded location.

d. DETERMINE background as follows:

1) Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and PERFORM background count on detector that was used for gas isotopic analysis.

- Open cave
- Applicable geometry for shelf that was used
- Five minute count time
- General library
- 5 cc sample volume
- Counting shelf removed

2) RECORD all identified isotopes and their associated background activity levels in µCi/cc on applicable Attachment.

e. Refer To applicable Attachment and CALCULATE gas activity as follows:

1) Refer To gas isotopic printout and RECORD all identified isotopes and their associated activity levels in µCi/cc.

2) For each isotope listed, SUBTRACT background activity from printout activity and RECORD as isotope activity in µCi/cc.

3) ADD isotope activities and RECORD as total gaseous activity in µCi/cc.

4) SIGN and DATE "Prepared By" line.

4.4.5 REPORT analysis results to MRDA or AMRDA.

4.4.6 IF copies of results are requested, FAX or SEND copies of completed Attachment(s) to requesting individuals.

– End of Section 4.4 –

4.5 3HVR*RE10B (Normal) Particulate and Iodine Sample Collection

_____ 4.5.1 IF automatic isolation of on−line filters has occurred AND Kaman high range system is in service, Go To Section 4.8.

_____ 4.5.2 NOTIFY MCRO that a 3HVR*RE10B particulate and iodine sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

NOTE

1. The shielded transport container for the cartridge holder has room for only one cartridge holder.
2. Preprinted labels for the plastic bags are available in the Chemistry lab.

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- Ventilation monitors 3HVR−RE11 thru 3HVR−RE18 particulate channel readings
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ−RE49)
- Difficulty in moving shielded transport container versus sample bucket

_____ 4.5.3 PROCEED to 3HVR*RE10B with the following:

- Cartridge holder containing new silver zeolite cartridge and particulate filter
- 1 silver zeolite cartridge (If standby filter housing charcoal cartridge has not been replaced with a silver zeolite cartridge)
- 2 plastic bags with labels
- Sample bucket with lid or shielded transport container

4.5.4 IF filter 10B1 is in use, PERFORM the following:

_____ a. VERIFY silver zeolite iodine cartridge and particulate filter installed in filter 10B2 housing.

_____ b. PLACE filter 10B2 in use as follows:

- OPEN 3HVR*V2010, filter 10B2 inlet isolation valve
- OPEN 3HVR*V2011, filter 10B2 outlet isolation valve

_____ c. REMOVE filter 10B1 from use as follows:

- CLOSE 3HVR*V2012, filter 10B1 inlet isolation valve
- CLOSE 3HVR*V2013, filter 10B1 outlet isolation valve

_____ d. RECORD the following times:

- Time used cartridge and filter removed from service on plastic bags found at 3HVR*RE10B
- Time new cartridge and filter placed in service on new plastic bags

_____ e. UNBOLT filter 10B1 housing and REMOVE cartridge holder and PLACE in one of the following:

- Sample bucket with lid
- Shielded transport container

4.5.5 IF filter 10B2 is in use, PERFORM the following:

_____ a. VERIFY silver zeolite iodine cartridge and particulate filter installed in filter 10B1 housing.

_____ b. PLACE filter 10B1 in use as follows:

- OPEN 3HVR*V2012, filter 10B1 inlet isolation valve
- OPEN 3HVR*V2013, filter 10B1 outlet isolation valve

c. REMOVE filter 10B2 from use as follows:

- CLOSE 3HVR*V2010, filter 10B2 inlet isolation valve
- CLOSE 3HVR*V2011, filter 10B2 outlet isolation valve

d. RECORD the following times:

- Time used cartridge and filter removed from service on plastic bags found at 3HVR*RE10B
- Time new cartridge and filter placed in service on new plastic bags

e. UNBOLT filter 10B2 housing and REMOVE cartridge holder and PLACE in one of the following:

- Sample bucket with lid
- Shielded transport container

4.5.6 INSTALL cartridge holder containing new silver zeolite cartridge and particulate filter and BOLT filter housing.

4.5.7 STORE new plastic bags at 3HVR*RE10B.

4.5.8 TRANSPORT sample to lab.

4.5.9 Using Kaman system, PERFORM the following:

a. VERIFY KAMAN console is on primary computer as follows:

1) PRESS "STATUS GRID" key.

2) VERIFY "UNIBUS SWITCH CONTROL" = "YES".

b. IF KAMAN console is not on primary computer, PERFORM the following:

1) PRESS "CANCEL DISP" key.

2) ROTATE "COMPUTER SELECT" switch to other computer.

3) Go To step 4.5.9 a.

c. TYPE "HVR10B 1" and PRESS "DATA BASE" key.

d. VERIFY the following is displayed in box in upper right hand corner of screen:

- "ON–LINE"
- "REACHABLE"
- "NO–ALARMS"

_____ 4.5.10 NOTIFY MRCO that you have completed changing iodine cartridge and particulate filter in 3HVR*RE10B.

_____ 4.5.11 Using information recorded on particulate filter and iodine cartridge plastic bags, PERFORM the following:

- RECORD sample stop date and time as sample date and time on Attachment 4
- Using start and stop date and times recorded on plastic bags, DETERMINE sample period in hours and RECORD on Attachment 4

_____ 4.5.12 Refer To SP 3867 (Att), "3HVR*RE10B and 3HVQ–RE49 Daily Average Logsheet," and CALCULATE average sample flow rate in ft^3/min for sample collection period and RECORD value on Attachment 4.

_____ 4.5.13 Refer To Attachment 4 and CALCULATE the following:

a. Average sample flow rate in ft^3/hr

b. Sample volume in cc

_____ 4.5.14 Go To Section 4.9.

– End of Section 4.5 –

4.6 3HVR*RE19B (Normal) Particulate and Iodine Sample Collection

_____ 4.6.1 IF automatic isolation of on−line filters has occurred AND Kaman high range system is in service, Go To Section 4.8.

_____ 4.6.2 NOTIFY MCRO that a 3HVR*RE19B particulate and iodine sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

NOTE

1. The shielded transport container for the cartridge holder has room for only one cartridge holder.
2. Preprinted labels for the plastic bags are available in the Chemistry lab.

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- Ventilation monitors 3HVR−RE11 thru 3HVR−RE18 particulate channel readings
- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ−RE49)
- Difficulty in moving shielded transport container versus sample bucket

_____ 4.6.3 PROCEED to 3HVR*RE19B with the following:

- Cartridge holder containing new silver zeolite cartridge and particulate filter
- 1 silver zeolite cartridges (If standby filter housing charcoal cartridge has not been replaced with a silver zeolite cartridge)
- 2 plastic bags with labels
- Sample bucket with lid or shielded transport container

4.6.4 IF filter 19B1 is in use, PERFORM the following:

_____ a. VERIFY silver zeolite iodine cartridge and particulate filter installed in filter 19B2 housing.

_____ b. PLACE filter 19B2 in use as follows:

- OPEN 3HVR*V2046, filter 19B2 inlet isolation valve
- OPEN 3HVR*V2047, filter 19B2 outlet isolation valve

_____ c. REMOVE filter 19B1 from use as follows:

- CLOSE 3HVR*V2048, filter 19B1 inlet isolation valve
- CLOSE 3HVR*V2049, filter 19B1 outlet isolation valve

_____ d. RECORD the following times:

- Time used cartridge and filter removed from service on plastic bags found at 3HVR*RE19B
- Time new cartridge and filter placed in service on new plastic bags

_____ e. UNBOLT filter 19B1 housing and REMOVE cartridge holder and PLACE in one of the following:

- Sample bucket with lid
- Shielded transport container

4.6.5 IF filter 19B2 is in use, PERFORM the following:

_____ a. VERIFY silver zeolite iodine cartridge and particulate filter installed in filter 19B1 housing.

_____ b. PLACE filter 19B1 in use as follows:

- OPEN 3HVR*V2048, filter 19B1 inlet isolation valve
- OPEN 3HVR*V2049, filter 19B1 outlet isolation valve

c. REMOVE filter 19B2 from use as follows:

- CLOSE 3HVR*V2046, filter 19B2 inlet isolation valve
- CLOSE 3HVR*V2047, filter 19B2 outlet isolation valve

d. RECORD the following times:

- Time used cartridge and filter removed from service on plastic bags found at 3HVR*RE19B
- Time new cartridge and filter placed in service on new plastic bags

e. UNBOLT filter 19B2 housing and REMOVE cartridge holder and PLACE in one of the following:

- Sample bucket with lid
- Shielded transport container

4.6.6 INSTALL cartridge holder containing new silver zeolite cartridge and particulate filter and BOLT filter housing.

4.6.7 STORE new plastic bags at 3HVR*RE19B.

4.6.8 TRANSPORT sample to lab.

4.6.9 Using Kaman system, PERFORM the following:

a. VERIFY KAMAN console is on primary computer as follows:

1) PRESS "STATUS GRID" key.

2) VERIFY "UNIBUS SWITCH CONTROL" = "YES".

b. IF KAMAN console is not on primary computer, PERFORM the following:

1) PRESS "CANCEL DISP" key.

2) ROTATE "COMPUTER SELECT" switch to other computer.

3) Go To step 4.6.9 a.

c. TYPE "HVR19B 1" and PRESS "DATA BASE" key.

d. VERIFY the following is displayed in box in upper right hand corner of screen:

- "ON–LINE"
- "REACHABLE"
- "NO–ALARMS"

_____ 4.6.10 NOTIFY MRCO that you have completed changing iodine cartridge and particulate filter in 3HVR*RE19B.

_____ 4.6.11 Using information recorded on particulate filter and iodine cartridge plastic bags, PERFORM the following:

- RECORD sample stop date and time as sample date and time on Attachment 5
- Using start and stop date and times recorded on plastic bags, DETERMINE sample period in hours and RECORD on Attachment 5

_____ 4.6.12 Refer To SP 3867 (Att), "3HVR*RE10B and 3HVQ–RE49 Daily Average Logsheet," and CALCULATE average sample flow rate in ft^3/min for sample collection period and RECORD value on Attachment 5.

_____ 4.6.13 Refer To Attachment 5 and CALCULATE the following:

a. Average sample flow rate in ft^3/hr

b. Sample volume in cc

_____ 4.6.14 Go To Section 4.9.

– End of Section 4.6 –

4.7 3HVQ–RE49 (Normal) Particulate and Iodine Sample Collection

_____ 4.7.1 NOTIFY MCRO that a 3HVQ–RE49 particulate and iodine sample will be collected by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

NOTE

1. The shielded transport container for the cartridge holder has room for only one cartridge holder.
2. Preprinted labels for the plastic bags are available in the Chemistry lab.

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- Sample dose rate
- Sample location dose rates
- Availability of elevator (None available for 3HVQ–RE49)
- Difficulty in moving shielded transport container versus sample bucket

_____ 4.7.2 PROCEED to 3HVQ–RE49 with the following:

- Cartridge holder containing new silver zeolite cartridge and particulate filter
- 2 plastic bags with labels
- Sample bucket with lid or shielded transport container

_____ 4.7.3 At 3HVQ–RE49 skid, PLACE sample pump switch in "OFF."

_____ 4.7.4 CLOSE the following valves:

- 3HVQ–V991, RE 49 inlet isolation valve
- 3HVQ–V999, RE 49 outlet isolation valve

_____ 4.7.5 RECORD time used cartridge and filter removed from service on plastic bags found at 3HVQ–RE49.

_____ 4.7.6 UNBOLT 3HVQ–RE49 filter housing and REMOVE cartridge holder and PLACE in one of the following:

- Sample bucket with lid
- Shielded transport container

_____ 4.7.7 INSTALL cartridge holder containing new silver zeolite cartridge and particulate filter and BOLT filter housing.

_____ 4.7.8 STORE new plastic bags at 3HVQ–RE49.

_____ 4.7.9 OPEN the following valves:

- 3HVQ–V991, RE 49 inlet isolation valve
- 3HVQ–V999, RE 49 outlet isolation valve

_____ 4.7.10 At 3HVQ–RE49 skid, PLACE sample pump switch in "AUTO."

_____ 4.7.11 RECORD time new cartridge and filter placed in service on new plastic bags

_____ 4.7.12 VERIFY sample flow rate is between red lines on flow meter located on 3HVQ–RE49 skid.

_____ 4.7.13 TRANSPORT sample to lab.

4.7.14 Using Kaman system, PERFORM the following:

a. VERIFY KAMAN console is on primary computer as follows:

1) PRESS "STATUS GRID" key.

2) VERIFY "UNIBUS SWITCH CONTROL" = "YES".

b. IF KAMAN console is not on primary computer, PERFORM the following:

1) PRESS "CANCEL DISP" key.

2) ROTATE "COMPUTER SELECT" switch to other computer.

3) Go To step 4.7.14 a.

c. TYPE "HVQ49 1" and PRESS "DATA BASE" key.

d. VERIFY the following is displayed in box in upper right hand corner of screen:

- "ON–LINE"
- "REACHABLE"
- "NO–ALARMS"

4.7.15 NOTIFY MRCO that you have completed changing iodine cartridge and particulate filter in 3HVQ–RE49.

4.7.16 Using information recorded on particulate filter and iodine cartridge plastic bags, PERFORM the following:

- RECORD sample stop date and time as sample date and time on Attachment 6
- Using start and stop date and times recorded on plastic bags, DETERMINE sample period in hours and RECORD on Attachment 6

4.7.17 Refer To SP 3867 (Att), "3HVR*RE10B and 3HVQ–RE49 Daily Average Logsheet," and CALCULATE average sample flow rate in ft^3/min for sample collection period and RECORD value on Attachment 6.

4.7.18 Refer To Attachment 6 and CALCULATE the following:

a. Average sample flow rate in ft^3/hr

b. Sample volume in cc

4.7.19 Go To Section 4.9.

– End of Section 4.7 –

4.8 **3HVR*RE10A or 3HVR*RE19A (High Range) Particulate and Iodine Sample Collection**

_____ 4.8.1 PROCEED to Kaman Electronic Remote Indication and Control (KERIC) Unit in Unit 3 Control Room.

_____ 4.8.2 OBTAIN KERIC control unit key from MRCO and INSERT into key switch.

_____ 4.8.3 ROTATE key switch to "ENABLE" position.

NOTE

Only the active channel will indicate a radiation exposure rate greater than zero.

4.8.4 DETERMINE filter radiation dose rates as follows:

_____ a. OBTAIN display of channel 3 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "3"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

_____ b. OBTAIN display of channel 4 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "4"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

_____ c. OBTAIN display of channel 5 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "5"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

4.8.5 DETERMINE sample volume through each filter as follows:

_____ a. OBTAIN display of channel 3 sample volume as follows:

1) PRESS "DSP"

2) PRESS "3"

3) PRESS "37"

4) PRESS "ENT"

5) RECORD sample volume: _____ cc

_____ b. OBTAIN display of channel 4 sample volume as follows:

1) PRESS "DSP"

2) PRESS "4"

3) PRESS "37"

4) PRESS "ENT"

5) RECORD sample volume: _____ cc

c. OBTAIN display of channel 5 sample volume as follows:

1) PRESS "DSP"

2) PRESS "5"

3) PRESS "37"

4) PRESS "ENT"

5) RECORD sample volume: _____ cc

4.8.6 CONSULT with MRDA or AMRDA and DETERMINE which filter(s) are to be replaced.

NOTE

A separate Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A) is used for each filter that is removed.

4.8.7 For each filter to be replaced, CIRCLE channel number on Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A).

4.8.8 IF filter presently in use is to be changed AND at least 1 of the other 2 filters has not been used, DIRECT flow to next available filter as follows:

a. IF channel 3 contains next available filter, PERFORM the following:

1) PRESS "FTN"

2) PRESS "3"

3) PRESS "04"

4) PRESS "ENT"

b. IF channel 4 contains next available filter, PERFORM the following:

1) PRESS "FTN"

2) PRESS "4"

3) PRESS "04"

4) PRESS "ENT"

_____ c. IF channel 5 contains next available filter, PERFORM the following:

1) PRESS "FTN"

2) PRESS "5"

3) PRESS "04"

4) PRESS "ENT"

_____ d. RECORD filter stop date and time as sample date and time on Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A).

_____ e. Refer To step 4.8.5 and DETERMINE sample volume for filter just removed from use and RECORD new value in step 4.8.5.

_____ 4.8.9 Refer To Step 4.8.5 and RECORD sample volume for each filter to be replaced on Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A).

NOTE

Both hours and minutes must be obtained for the sample collection period.

4.8.10 PERFORM the following to obtain sample collection period:

_____ a. OBTAIN display of sample period for filter 3 as follows:

1) PRESS "DSP"

2) PRESS "3"

3) PRESS "45"

4) PRESS "ENT"

5) RECORD display value: _____ hours

6) PRESS "EXP"

7) RECORD display value: _____ minutes

_____ b. OBTAIN display of sample period for filter 4 as follows:

1) PRESS "DSP"

2) PRESS "4"

3) PRESS "45"

4) PRESS "ENT"

5) RECORD display value: _____ hours

6) PRESS "EXP"

7) RECORD display value: _____ minutes

_____ c. OBTAIN display of sample period for filter 5 as follows:

1) PRESS "DSP"

2) PRESS "5"

3) PRESS "45"

4) PRESS "ENT"

5) RECORD display value: _____ hours

6) PRESS "EXP"

7) RECORD display value: _____ minutes

_____ 4.8.11 ROTATE KERIC control unit key switch to "DISABLE" position and REMOVE key.

NOTE

3HVR*RE10A and 3HVR*RE19A will automatically shift to the next available filter when a radiation level of 100 mr/hr is detected from the in use filter. The filters shift in sequential order from lowest channel to highest and then back to lowest.

4.8.12 IF filter to be changed was removed from service automatically, DETERMINE sample date and time as follows:

_____ a. IF filter to be changed was previous in use filter, Refer To step 4.8.10 and SUBTRACT sample period of in use filter from present time and RECORD result as sample date and time on Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A).

_____ b. IF filter to be changed was not previous in use filter, Refer To step 4.8.10 and SUBTRACT sample period of running filter and previously running filter from present time and RECORD result as sample date and time on Attachment 7 (3HVR*RE10A) or Attachment 8 (3HVR*RE19A).

_____ 4.8.13 NOTIFY MCRO that a particulate and iodine sample will be collected from 3HVR*RE10A or 3HVR*RE19A by Ventilation PASS Team consisting of the following:

- At least one Chemistry Technician
- At least one Health Physics Technician

NOTE

The shielded transport container for the cartridge holder has room for only one cartridge holder.

ALARA

Health Physics should be consulted to determine whether to transport the sample in a sample bucket with lid or in the shielded transport container. The decision should be made taking the following into consideration:

- Sample dose rate (recorded in step 4.8.4)
- Sample location dose rates
- Availability of elevator (None available for 3HVQ–RE49)
- Difficulty in moving shielded transport container versus sample bucket

_____ 4.8.14 COLLECT the following equipment:

- Cartridge holder containing new silver zeolite cartridge and particulate filter for each filter to be changed out
- Sample bucket with lid or shielded transport container
- Mechanical fingers
- Reach rod

NOTE

Change filter lights are located on top of 3HVR*RE10A and 3HVR*RE19A. The change light should be lit for filters that have been removed from service following a period of use. The filter numbers and channel numbers do not match. The filter numbers and the corresponding channel numbers are listed below.

- Filter 1 .... Channel 3
- Filter 2 .... Channel 4
- Filter 3 .... Channel 5

_____ 4.8.15 PROCEED to 66' 6" elevation of Auxiliary Building.

_____ 4.8.16 UNLATCH and OPEN door of filter housing.

_____ 4.8.17 Using reach rod, LOWER filter housing.

_____ 4.8.18 Using mechanical fingers, REMOVE cartridge holder and PLACE in one of the following:

- Shielded transport container
- Sample bucket with lid

_____ 4.8.19 LABEL cartridge holder, sample bucket, or shielded transport container with applicable cartridge holder identification including the following:

- Rad monitor: 3HVR*RE10A or 3HVR*RE19A
- Channel number

_____ 4.8.20 Using mechanical fingers, PLACE cartridge holder containing new silver zeolite cartridge and particulate filter in filter housing.

_____ 4.8.21 Using reach rod, RAISE filter housing back into position.

_____ 4.8.22 CLOSE and LATCH door of filter housing.

_____ 4.8.23 IF another filter needs to be changed, Go To step 4.8.16.

_____ 4.8.24 TRANSPORT samples to lab.

_____ 4.8.25 PROCEED to Kaman Electronic Remote Indication and Control (KERIC) Unit in Unit 3 Control Room.

_____ 4.8.26 INSERT KERIC control unit key into key switch.

_____ 4.8.27 ROTATE key switch to "ENABLE" position.

CAUTION

Step 4.8.28 re–zeros all sample information. Care must be taken to only perform step 4.8.28 for the channels that now contain new silver zeolite cartridges and particulate filters that are not presently in use.

4.8.28 For each filter that was replaced, PERFORM the following:

_____ a. IF channel 3 filter was replaced, PERFORM the following:

1) PRESS "STP"

2) PRESS "3"

3) PRESS "ENT"

_____ b. IF channel 4 filter was replaced, PERFORM the following:

1) PRESS "STP"

2) PRESS "4"

3) PRESS "ENT"

_____ c. IF channel 5 filter was replaced, PERFORM the following:

1) PRESS "STP"

2) PRESS "5"

3) PRESS "ENT"

_____ 4.8.29 ROTATE KERIC control unit key switch to "DISABLE" position and REMOVE key.

_____ 4.8.30 IF no more filters are to be replaced at this time, RETURN KERIC control unit key to MRCO.

_____ 4.8.31 Go To Section 4.9.

– End of Section 4.8 –

4.9 Particulate and Iodine Sample Analysis

ALARA

The particulate filters and iodine cartridges may be highly radioactive resulting in high radiation levels in the vicinity. Health Physics should be consulted to determine appropriate handling precautions.

_____ 4.9.1 REMOVE iodine cartridge and particulate filter from cartridge holder and PERFORM the following:

- PLACE particulate filter in new plastic bag and SEAL bag.
- PLACE iodine cartridge in filter holder located in hood.

_____ 4.9.2 STORE particulate filter in shielded location.

_____ 4.9.3 BLOW air through iodine cartridge for 5 minutes.

_____ 4.9.4 REMOVE iodine cartridge from holder and PLACE in new plastic bag and SEAL bag.

4.9.5 DETERMINE iodine isotopic activity as follows:

_____ a. PLACE 2.5 cm shelf in detector to be used for iodine isotopic analysis.

_____ b. Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and ANALYZE iodine sample:

- Open cave
- Applicable geometry for shelf being used
- Five minute count time
- General library
- Sample volume recorded on applicable Attachment
- Sample date and time recorded on applicable Attachment

c. IF dead time is greater than or equal to 20%, PERFORM the following:

1) ABORT count.

2) REPLACE shelf with next higher shelf.

3) Go To step 4.9.5 b.

d. STORE iodine cartridge in shielded location.

e. DETERMINE background as follows:

1) Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and PERFORM background count on detector that was used for iodine isotopic analysis.

- Open cave
- Applicable geometry for shelf that was used
- Five minute count time
- General library
- Sample volume that was used
- Counting shelf removed

2) RECORD all identified isotopes and their associated background activity levels in µCi/cc on applicable Attachment.

f. Refer To applicable Attachment and CALCULATE iodine activity as follows:

1) Refer To iodine isotopic printout and RECORD all identified isotopes and their associated activity levels in µCi/cc.

2) For each isotope listed, SUBTRACT background activity from printout activity and RECORD as isotope activity in µCi/cc.

3) ADD isotope activities and RECORD as total iodine activity in µCi/cc.

4) MULTIPLY total iodine activity by plateout correction and RECORD as corrected total iodine activity in µCi/cc [Ref. 6.10].

4.9.6 DETERMINE particulate isotopic activity as follows:

a. PLACE 2.5 cm shelf in detector to be used for particulate isotopic analysis.

b. Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and ANALYZE particulate sample.

- Open cave
- Applicable geometry for shelf being used
- Five minute count time
- General library
- Sample volume recorded on applicable Attachment
- Sample date and time recorded on applicable Attachment

c. IF dead time is greater than or equal to 20%, PERFORM the following:

1) ABORT count.

2) REPLACE shelf with next higher shelf.

3) Go To step 4.9.6 b.

d. STORE particulate filter in shielded location.

e. DETERMINE background as follows:

1) Using the following information, Refer To CP 801/2801/3801AT, "Gamma Spectroscopy Counting System Maintenance and Operation," and PERFORM background count on detector that was used for particulate isotopic analysis.

- Open cave
- Applicable geometry for shelf that was used
- Five minute count time
- General library
- Sample volume that was used
- Counting shelf removed

2) RECORD all identified isotopes and their associated background activity levels in µCi/cc on applicable Attachment.

f. Refer To applicable Attachment and CALCULATE particulate activity as follows:

1) Refer To particulate isotopic printout and RECORD all identified isotopes and their associated activity levels in µCi/cc.

2) For each isotope listed, SUBTRACT background activity from printout activity and RECORD as isotope activity in µCi/cc.

3) ADD isotope activities and RECORD as total particulate activity in µCi/cc.

4) MULTIPLY total particulate activity by plateout correction and RECORD as corrected total particulate activity in µCi/cc [Ref. 6.10].

4.9.7 REPORT analysis results to MRDA or AMRDA.

4.9.8 IF copies of results are requested, FAX or SEND copies of completed Attachment(s) to requesting individuals.

4.9.9 Refer To Attachment 9 and PERFORM the following:

a. INSPECT O–rings on cartridge holder.

NOTE

1. The sample flow passes through the particulate filter first and then the iodine cartridge.
2. The particulate filter is installed with the "fibrous" side toward the iodine–particulate sample holder inlet.
3. The iodine cartridge has an arrow indicating the direction of flow through the cartridge.

b. INSTALL new silver zeolite cartridge and particulate filter in cartridge holder.

– End of Section 4.9 –

4.10 Monitoring of In–Use Filters

_____ 4.10.1 PROCEED to Kaman Electronic Remote Indication and Control (KERIC) Unit in Unit 3 Control Room.

_____ 4.10.2 OBTAIN KERIC control unit key from MRCO and INSERT into key switch.

_____ 4.10.3 ROTATE key switch to "ENABLE" position.

NOTE

Only the active channel will indicate a radiation exposure rate greater than zero.

4.10.4 DETERMINE which filter is currently in use by determining radiation dose rates as follows:

_____ a. OBTAIN display of channel 3 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "3"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

_____ b. OBTAIN display of channel 4 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "4"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

_____ c. OBTAIN display of channel 5 radiation dose rate as follows:

1) PRESS "DSP"

2) PRESS "5"

3) PRESS "23"

4) PRESS "ENT"

5) RECORD dose rate: _____ mr/hr

_____ 4.10.5 ROTATE KERIC control unit key switch to "DISABLE" position and REMOVE key.

_____ 4.10.6 RETURN KERIC control unit key to MRCO.

_____ 4.10.7 IF filter radiation level approaches 25 mr/hr, NOTIFY MRDA or AMRDA.

– End of Section 4.10 –

5. REVIEW AND SIGNOFF

5.1 The review and signoff for this procedure is located in Attachments 1 through 8.

6. REFERENCES

6.1 Regulatory Guide 1.97

6.2 NUREG 0737

6.3 NUREG–1031, "Safety Evaluation report related to the operation of Millstone Nuclear Power Station, Unit No. 3," dated August 2, 1984.

6.4 "Final Safety Analysis Report Unit 3", Section 13.3 "Millstone Nuclear Power Station Emergency Plan"

6.5 "Millstone Nuclear Power Station Emergency Plan"

6.6 NUREG–0654, Revision 1, "Criteria for Preparation of Radiological Emergency Response Plans, and Preparedness in Support of Nuclear Power Plants"

6.7 NUREG–0737, "Clarification of TMI Action Plan Requirements, Supplement 1, Requirements for Emergency Response Capability"

6.8 Kaman Sciences Corporation; Instruction Manual, "Operation–Maintenance Instructions and Parts Catalog for Accident Range Gas Monitor, Model KMG–HRC"

6.9 "Radiological Effluent Monitoring and Off–Site Dose Calculation Manual," (REMODCM)

6.10 Inspector follow up items: 50–245/84–07–03 and 50–336/84–09–03. Corrected iodine and particulate activity released for plateout.

6.11 DCN DM3–00–0258–99, "Addition of Sample Connections for Radiation Monitor 3HVQ–RE49B"

7. SUMMARY OF CHANGES

7.1 Moved 3HVQ–RE49 sample location to new valves installed under Reference 6.11.

7.2 Added steps to obtain number of minutes a filter was in service.

7.3 Added note indicating that only the active channel will display a measured dose.

Attachment 1
Unit 3 Post Accident Sampling Vent Gaseous Release Worksheet

(Sheet 1 of 1)

3HVR*RE10 Gaseous Activities

Sample date and time: _____

	Printout Activity – Background = Isotope Activity		
Isotope	**Printout Activity (µCi/cc)**	**Background (µCi/cc)**	**Isotope Activity (µCi/cc)**
Total Gaseous Activity (summation of all isotopes) (µCi/cc)			

Prepared by: _____
Signature Date

Level of Use
Continuous

STOP THINK ACT REVIEW

Attachment 2
Unit 3 Post Accident Sampling SLCRS
Gaseous Release Worksheet

(Sheet 1 of 1)

3HVR*RE19 Gaseous Activities

Sample date and time: _____

	Printout Activity – Background = Isotope Activity		
Isotope	**Printout Activity (µCi/cc)**	**Background (µCi/cc)**	**Isotope Activity (µCi/cc)**
Total Gaseous Activity (summation of all isotopes) (µCi/cc)			

Prepared by: _____
Signature Date

Level of Use
Continuous

STOP THINK ACT REVIEW

Attachment 3
Unit 3 Post Accident Sampling ESF
Gaseous Release Worksheet

(Sheet 1 of 1)

3HVQ–RE49 Gaseous Activities

Sample date and time: _____

	Printout Activity – Background = Isotope Activity		
Isotope	**Printout Activity (µCi/cc)**	**Background (µCi/cc)**	**Isotope Activity (µCi/cc)**
Total Gaseous Activity (summation of all isotopes) (µCi/cc)			

Prepared by: _____
Signature Date

Level of Use
Continuous

STOP THINK ACT REVIEW

Attachment 4
Unit 3 Post Accident Sampling Vent (Normal)
Particulate and Iodine Release Worksheet

(Sheet 1 of 2)

3HVR*RE10B

Sample date and time: _____ Sample period: _____ hours

Average sample flow rate: _____ ft^3/min • 60 minutes/hr = _____ ft^3/hr

Sample volume = average sample flow rate in ft^3/hr • sample period in hours • 28,316 cc/ft^3

Sample volume = _____ • _____ • 28,316 cc/ft^3 = _____ cc

Iodine			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
I−131			
I−132			
I−133			
I−134			
I−135			
Total Iodine Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 10
Corrected Total Iodine Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 4
Unit 3 Post Accident Sampling Vent (Normal)
Particulate and Iodine Release Worksheet
(Sheet 2 of 2)

3HVR*RE10B

Particulate			
	Printout Activity – Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
Total Particulate Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 2
Corrected Total Particulate Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 5
Unit 3 Post Accident Sampling SLCRS (Normal)
Particulate and Iodine Release Worksheet

(Sheet 1 of 2)

3HVR*RE19B

Sample date and time: _____ Sample period: _____ hours

Average sample flow rate: _____ ft^3/min • 60 minutes/hr = _____ ft^3/hr

Sample volume = average sample flow rate in ft^3/hr • sample period in hours • 28,316 cc/ft^3

Sample volume = _____ • _____ • 28,316 cc/ft^3 = _____ cc

Iodine			
	Printout Activity – Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
I–131			
I–132			
I–133			
I–134			
I–135			
Total Iodine Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 10
Corrected Total Iodine Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 5
Unit 3 Post Accident Sampling SLCRS (Normal)
Particulate and Iodine Release Worksheet
(Sheet 2 of 2)

3HVR*RE19B

Particulate			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
Total Particulate Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 2
Corrected Total Particulate Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 6
Unit 3 Post Accident Sampling ESF
Particulate and Iodine Release Worksheet
(Sheet 1 of 2)

3HVQ–RE49

Sample date and time: _____ Sample period: _____ hours

Average sample flow rate: _____ ft^3/min • 60 minutes/hr = _____ ft^3/hr

Sample volume = average sample flow rate in ft^3/hr • sample period in hours • 28,316 cc/ft^3

Sample volume = _____ • _____ • 28,316 cc/ft^3 = _____ cc

Iodine			
	Printout Activity – Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
I–131			
I–132			
I–133			
I–134			
I–135			
Total Iodine Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 10
Corrected Total Iodine Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 6
Unit 3 Post Accident Sampling ESF
Particulate and Iodine Release Worksheet
(Sheet 2 of 2)

3HVQ–RE49

Particulate			
	Printout Activity – Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
Total Particulate Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 2
Corrected Total Particulate Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 7
Unit 3 Post Accident Sampling Vent (High Range)
Particulate and Iodine Release Worksheet

(Sheet 1 of 2)

3HVR*RE10A

Channel number (circle one): 3 4 5

Sample date and time: _____ Sample period: _____ hours

Sample volume: _____ cc

Iodine			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
I−131			
I−132			
I−133			
I−134			
I−135			
Total Iodine Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 10
Corrected Total Iodine Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 7
Unit 3 Post Accident Sampling Vent (High Range)
Particulate and Iodine Release Worksheet

(Sheet 2 of 2)

3HVR*RE10A

Particulate			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
Total Particulate Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 2
Corrected Total Particulate Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 8
Unit 3 Post Accident Sampling SLCRS (High Range)
Particulate and Iodine Release Worksheet

(Sheet 1 of 2)

3HVR*RE19A

Channel number (circle one): 3 4 5

Sample date and time: _____ Sample period: _____ hours

Sample volume: _____ cc

Iodine			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
I−131			
I−132			
I−133			
I−134			
I−135			
Total Iodine Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 10
Corrected Total Iodine Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 8
Unit 3 Post Accident Sampling SLCRS (High Range)
Particulate and Iodine Release Worksheet
(Sheet 2 of 2)

3HVR*RE19A

Particulate			
	Printout Activity − Background = Isotope Activity		
Isotope	Printout Activity (µCi/cc)	Background (µCi/cc)	Isotope Activity (µCi/cc)
Total Particulate Activity (summation of all isotopes) (µCi/cc)			
x Plateout Correction [Ref. 6.10]			x 2
Corrected Total Particulate Activity (µCi/cc)			

Prepared by: _____
Signature Date

Attachment 9
Cartridge Holder Configuration
(Sheet 1 of 1)