LIMERICK GENERATING STATION

EMERGENCY PLAN PROCEDURE INDEX

PROCEDURE NUMBER	REV. NO.	TITLE	DATE SIGNED BY SUPER.	DATE OF LAST PERIODIC REVIEW
EP-101	3	Classification of Emergencies	12/12/84	
EP-102	6	Unusual Event Response	12/12/84	
EP-103	6	Alert Response	12/12/84	
EP-104	6	Site Emergency Response	12/12/84	
EP-105	6	General Emergency Response	12/12/84	
EP-106	2	Written Summary Notification	12/12/84	
EP-110	4	Personnel Assembly and Accountability	12/12/84	
EP-120	2	Site Emergency Coordinator	12/12/84	
EP-201	2	Technical Support Center (TSC) Activation	12/12/84	
EP-202	3	Operations Support Center (OSC) Activation	12/12/84	
EP-203	3	Emergency Operations Facility (EOF) Activation	12/13/84	
EP-208	4	Security Team	12/12/84	
EP-210	3	Dose Assessment Team	12/12/84	
EP-211	0	Field Survey Group	12/12/84	
EP-220		CANCELLED		
EP-221		CANCELLED		
EP-222		CANCELLED		
EP-230	4	Chemistry Sampling and Analysis Team	12/12/84	
EP-231	6	Operation of Post-Accident Sampling Systems (PASS)	01/11/85	
EP-232		CANCELLED		

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EMERGENCY PLAN PROCEDURE INDEX

PROCEDURE NUMBER	REV. NO.	TITLE	DATE SIGNED BY SUPER.	DATE OF LAST PERIODIC REVIEW
EP-233	4	Retrieving and Changing Sample Filters and Cartridges from the Containment Leak Detector During Emergencies	12/12/84	
EP-234	4	Obtaining Containment Gas Samples from the Containment Leak Detector During Emergencies	12/12/84	
EP-235	4	Obtaining Reactor Water Samples from Sample Sinks Following Accident Conditions	12/12/84	
EP-236	4	Obtaining Cooling Tower Blowdown Line Water Samples Following Radioactive Liquid Release after Accident Conditions	12/12/84	
EP-237	5	Obtaining the Iodine/ Particulate and/or Gas Samples from the North Vent Wide Range Gas Monitor (WRGM)	01/11/85	
EP-238	4	Obtaining Liquid Radwaste Samples from Radwaste Sample Sink Following Accident Conditions	12/12/84	
EP-240		CANCELLED		
EP-241	6	Sample Preparation and Handling of Highly Radioactive Liquid Samples	01/03/85	
EP-242	4	Sample Preparation and Handling of Highly Radioactive Particulate Filters and Iodine Cartridges	12/12/84	
EP-243	5	Sample Preparation and Handling of Highly Radioactive Gas Samples	12/12/84	
EP-244	1	Offsite Analysis of High Activity Samples	12/12/84	

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PROCEDURE NUMBER	REV. NO.	TITLE	DATE SIGNED BY SUPER.	DATE OF LAST PERIODIC REVIEW
EP-250	2	Personnel Safety Team	12/12/84	
EP-251	2	Plant Survey Group	12/12/84	
EP-252	3	Search and Rescue/First Aid Group	12/12/84	
EP-253	0	Personnel Dosimetry, Bioassay, and Respiratory Protection Group	12/12/84	
EP-254	2	Vehicle and Evacuee Control Group	12/12/84	
EP-255	2	Vehicle Decontamination	12/12/84	
EP-260	2	Fire and Damage Control Team	12/12/84	
EP-261	2	Damage Repair Group	12/12/84	
EP-272	3	Philadelphia Electric Company Officials Phone List	12/12/84	
EP-273	3	Limerick Station Supervision Call List	12/12/84	
EP-275		CANCELLED		
EP-276	4	Fire and Damage Team Phone List	12/12/84	
EP-277	5	Personnel Safety Team Phone List	12/12/84	
EP-278	3	Security Team Phone List	12/12/84	
EP-279	3	Emergency Operations Facility (EOF) Group Phone List	12/12/84	
EP-280	4	Technical Support Center Phone List	12/12/84	
EP-282	3	Government and Emergency Management Agencies Phone List	12/12/84	
EP-284	3	Company Consultants and Contractors Phone List	12/12/84	
EP-287	2	Nearby Public and Industrial Users of Downstream Water	12/12/84	

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EMERGENCY PLAN PROCEDURE INDEX

PROCEDURE NUMBER	REV. NO.	TITLE	DATE SIGNED BY SUPER.	DATE OF LAST PERIODIC REVIEW
EP-291	4	Staffing Augmentation	12/12/84	
EP-292	5	Chemistry Sampling and Analysis Team Phone List	12/12/84	
EP-294	4	Dose Assessment Team Phone List	12/12/84	
EP-301	1	Operating the Evacuation Alarm and River Warning System	12/12/84	
EP-303	3	Local Evacuation	12/12/84	
EP-304	3	Partial Plant Evacuation	12/12/84	
EP-305	3	Site Evacuation	12/12/84	
EP-306	1	Evacuation of the Information Center	12/12/84	
EP-307	2	Reception and Orientation of Support Personnel	12/12/84	
EP-312	1	Radioactive Liquid Release	12/12/84	
EP-313	2	Distribution of Thyroid Blocking Tablets	12/12/84	
EP-314	0	Emergency Radiation Exposure Guidelines and Controls	12/06/84	
EP-315	2	Calculation of Offsite Doses During a Radiological Emergency Using RMMS in the Manual Mode	12/12/84	
EP-316	2	Cumulative Population and Near Real-Time Emergency Dose Calculations for Airborne Releases Manual Method	12/13/84	
EP-317	2	Determination of Protective Action Recommendations	12/12/84	
EP-318	1	Liquid Release Dose Calculations Method for Drinking Water	12/12/84	

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PROCEDURE NUMBER	REV. NO.	TITLE	DATE SIGNED BY SUPER.	DATE OF LAST PERIODIC REVIEW
EP-319	1	Fish Ingestion Pathway Dose Calculation	12/12/84	
EP-325	2	Use of Containment Dose Rates to Estimate Release Source Term	12/12/84	
EP-330	3	Emergency Response Facility Habitability	12/12/84	
EP-401	2	Entry for Emergency Repair and Operations	12/12/84	
EP-410	2	Recovery Phase Implementation	12/12/84	
EP-500	2	Review and Revision of Emergency Plan	12/12/84	

PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

EP-231 OPERATION OF POST-ACCIDENT SAMPLING SYSTEMS (PASS)

1.0 PARTICIPANTS

1.1 Chemistry Sampling and Analysis Team Leader shall obtain necessary information and permissions to obtain sample.

1.2 Chemistry Sampling and Analysis Group Leader shall organize and brief the sampling group and have operations defeat isolations.

1.3 HP Technicians shall provide radiological assessment of the task.

1.4 Chemistry Sampling and Analysis Group shall obtain the sample.

2.0 ACTIONS-IMMEDIATE

2.1 Chemistry Sampling and Analysis Team Leader shall:

2.1.1 Request input from the Control Room (via Emergency Director) to ascertain desired sample system availability.

2.1.2 After discussing the situation with the Emergency Director, determine which of the following PASS samples are required based on the following information:

Sample
1. Drywell Atmosphere
A. Upper Drywell 291' El
B. Lower Drywell 242' El
2. Suppression Pool Atmosphere
A. 222' El-250 Deg Azimuth from North
B. 222' El-70 Deg Azimuth from North

3. Secondary Containment Atmosphere

4. Primary Coolant Jet Pump

   At low (<1%) power for small break or non-break events, raise Reactor Water level to level of the moisture separators.

5. RHR

   A. "A" RHR

   B. "B" RHR

MODE	SYS. OP. TIME	SOURCE
LPCI	30 mins.	Supp. Pool
Cont. Spray Cooling		Supp. Pool
Supp. Pool Cooling		Supp. Pool
Shutdown Cooling	30 mins.	Rx Coolant
Steam Condensing		Rx Steam
Fuel Pool Cooling		Fuel Pool

2.1.3 Check the Plant Radiation Level Status Board to forecast anticipated radiological conditions.

2.1.4 Contact the Personnel Safety Team Leader and check on the latest developments related to radiological conditions and inform him what sample(s) are to be taken and that Health Physics' coverage is required.

CONTINUOUS COVERAGE BY A HEALTH PHYSICS TECHNICIAN MAY SUBSTITUTE FOR THE RADIATION WORK PERMIT.

2.1.5 Determine what analyses are required and inform the Chemistry Sampling and Analysis Group Leader what analyses are required. If an iodine/particulate sample is desired, recommend sampling time.

2.1.6 Request Emergency Exposure Authorizations from the Emergency Director for group members (as required) and inform the Personnel Safety Team Leader of this development.

2.1.7 Direct the Chemistry Sampling and Analysis Group Leader to collect and analyze the PASS samples.

2.2 Chemistry Sampling and Analysis Group Leader shall:

2.2.1 Assign the appropriate number of group members to obtain the necessary equipment to collect and transport the sample to the Chemistry Hot lab.

EYE PROTECTION SHOULD BE WORN BY ALL PERSONNEL WHEN OBTAINING SAMPLES FROM THE SAMPLE STATION.

2.2.2 If a particulate/iodine cartridge sample is to be obtained, contact the Chemistry Sampling and Analysis Team Leader (TSC) for an estimated sampling time and record this time on Appendix EP-231-3.

2.2.3 Once the sample type and sampling location has been determined, contact the Control Room and request a system line-up to permit collection of the appropriate sample in accordance with the following information. Also, inform operations to contact the Chemistry Sampling and Analysis Group Leader if problems with the line-up arise during sampling.

	SAMPLE LOCATION	SWITCH	SWITCH NAME	POSITION
A.	Upper Drywell (291') or Lower Drywell (242')	SV-57-132,134,150 -(232,234,250)	1 B Containment Atmosphere Sample Sys. Isolation	OPEN
		HS-57-153(253)	Drywell Atmosphere Sample Sys. Isolation	AUTO
		SV-57-183(283)	1A Containment Atmosphere Sample Sys. Isolation	AUTO
	SAMPLE LOCATION	SWITCH	SWITCH NAME	POSITION
		HS-57-187(287)	Suppression Pool Atmosphere Sample Sys. Isolation	AUTO
		*HSS-57-191A(291A)	Containment Isolation Signal Bypass	BYPASS

	*HSS-57-191B(291B)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191C(291C)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191D(292D)	Containment Isolation Signal Bypass	BYPASS

* Only necessary if containment isolation signal is present

SAMPLE LOCATION	SWITCH	SWITCH NAME	POSITION
B. Suppression Pool(222') (250 Deg Azimuth from North)	SV-57-183,191 -(283,291)	1 A Containment Atmosphere Sample Sys. Isolation	AUTO
	HS-57-187(287)	Suppression Pool Atmosphere Sample Sys. Isolation	AUTO
	*HSS-57-191A(291A)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191C(291C)	Containment Isolation Signal Bypass	BYPASS

SAMPLE LOCATION	SWITCH	SWITCH NAME	POSITION
C. Suppression Pool (222') (70 Deg Azimuth from North)	SV-57-181(281)	1 B Containment Atmosphere Sample Sys. Isolation	AUTO
	HS-57-187(287)	Suppression Pool Atmosphere Sample Sys. Isolation	AUTO
	*HSS-57-191A (291A)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191B(291B)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191C(291C)	Containment Isolation Signal Bypass	BYPASS
	SV-57-183, 191 -(283,291)	1A Containment Atmosphere Sample System Isolation	AUTO
* Only necessary if containment isolation signal is present			
D. Secondary Containment		No Line-up Necessary	
E. "A" RHR	HV-51-1F079A (2F079A)	Sample Inboard	OPEN
	HV-51-1F080A (2F080A)	Sample Outboard	OPEN
	*HSS-57-191A(291A)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191B(291B)	Containment Isolation Signal Bypass	BYPASS
	**HV51-1F047A	Heat Exch Bypass INLET	OPEN

SAMPLE LOCATION	SWITCH	SWITCH NAME	POSITION
F. "B" RHR	HV-51-1F079B (2F079B)	Sample Inboard	OPEN
	HV-51-1F080B (2F080B)	Sample Outboard	OPEN
	*HSS-57-191A(291A)	Containment Isolation Signal Bypass	BYPASS
	*HSS-57-191B(291B)	Containment Isolation Signal Bypass	BYPASS
	**HV51-1F047B (2F047B)	Heat Exch Bypass INLET	OPEN

* Only necessary if containment isolation signal is present.

** Only necessary if RHR placed in LPCI mode.

G. JET PUMP

To ensure a representative liquid sample from the jet pumps at low (<1%) power conditions for small break or non-break events, the reactor water level will be raised to the level of the moisture separator when this action is not inconsistent with station emergency procedures. This will fully flood the separators and will provide a thermally-induced recirculation flow path for mixing.

2.2.5 Have the shift verify that the liquid return line to the Suppression Pool is open by placing the following switch in the appropriate position:

UNIT	SWITCH	SWITCH NAME	POSITION
1	HV-52-1F001D	Core Spray Suction D	OPEN
2	HV-52-1F001A	Core Spray Suction A	OPEN

2.2.6 Appoint Group member(s) to prepare the Hot Lab for receiving the sample.

USE THE FOLLOWING PROCEDURES AS GUIDELINES FOR PREPARATION OF THE HOT LAB.

EP-241 (LIQUID) Sample Preparation and Handling of Highly Radioactive Liquid Samples

EP-242 (IODINE) Sample Preparation and Handling of Highly Radioactive Particulate Filters and Iodine Cartridges

EP-243 (GAS) Sample Preparation and Handling of Highly Radioactive Gas Samples

2.2.7 If a large volume liquid sample is to be taken and an outside route is to be taken, contact the Fire and Damage Repair Team Leader for providing the means of transportation for the Large Volume Cask.

2.2.8 Brief the Chemistry Sampling and Analysis Group members on the following:

2.2.8.1 Communications equipment and channel

2.2.8.2 Type of sample(s) to be collected

2.2.8.3 Location of sample points

2.2.8.4 Suggested Routes to be taken

2.2.8.5 Precautions for operating the PASS

2.2.8.6 Projected amount of time required to collect and tranport the sample

2.2.8.7 Review the procedures to be followed for sample collection, handling, preparation and analysis

2.2.8.8 Special tools and equipment required for sample handling and/or collection

2.2.8.9 Proper completion of data sheets

2.2.9 Dispatch the Chemistry Sampling and Analysis Team members to the OSC for Health Physics support if radiological conditions permit or other appointed location as determined by the Plant Survey Group Leader.

2.3 <u>Health Physics Technician</u> shall:

2.3.1 Determine the appropriate route to be taken.

2.3.2 Take appropriate radiation survey equipment and ensure that equipment is functional and calibrated.

2.3.3 Provide group members with the appropriate dosimetry, protective clothing and respiratory equipment.

2.3.4 Perform a pre-job briefing with the Chemistry technicians assigned to obtain the sample to discuss the following:

2.3.4.1 RWP requirements

2.3.4.2 Routes to PASS Facility

2.3.4.3 Authorized doses

2.3.4.4 Radiological concerns and precautions

2.3.4.5 Review of procedure for obtaining and transporting sample to hot lab

2.3.4.6 Suggested methods to maintain exposures ALARA

2.3.4.7 Stay times and Abort Criteria

2.3.5 Provide constant coverage while obtaining and transporting samples from the PASS.

2.3.6 Monitor dose rates enroute and at the sample location. If the general area dose rates exceed 5 R/hr at the door leading to the Turbine Enclosure, 217'-0" El. or 10 R/hr within the Turbine enclosure (enroute to or at the sampling point) instruct Group Members to immediately exit the area and report to the Chemistry Sampling and Analysis Group Leader.

2.3.7 Survey the sample area (concentrating especially on the PASS) and the sample container once the sample has been collected and the shielded sample cask.

MINIMUM AMOUNT OF TIME SHOULD BE SPENT NEAR THE SURFACE OF THE SAMPLE ENCLOSURE.

2.3.8 Document the sample cask survey results and give them to the Chemistry Sampling and Analysis Group Leader (or other designated group member) when arriving at the hot lab.

2.3.9 Provide constant coverage during sample preparation and handling as specified in EP-241, EP-242 or EP-243.

2.4 Chemistry Sampling and Analysis Group members shall:

2.4.1 Assemble for a pre-job briefing at the chemistry lab.

2.4.2 Inform the Group Leader if they are approaching the Administrative exposure guidelines, or may not have sufficient exposure remaining to successfully complete the assigned task.

2.4.3 Obtain the Chemistry Emergency Supplies Toolbox Key.

2.4.4 Obtain the necessary equipment to collect the sample and ensure that the Hot Lab is ready to accept the sample.

PROPERLY LABEL ALL SAMPLE CONTAINERS

2.4.5 Once the group has been briefed and the appropriate equipment has been assembled proceed to the OSC or other designated location for Health Physics coverage. Once briefed by Health Physics collect the sample in accordance with the appropriate appendix to this procedure. (see following)

THE INDICATOR FOR AREA RADIATION DETECTOR RE-507 IS ON THE CONTROL PANEL AND ITS READING SHOULD BE NOTED.

Appendix	Title
EP-231-1	Procedure for Obtaining a 14.4 ml Gas Sample
EP-231-2	Procedure for Obtaining an Iodine/Particulate Sample
EP-231-3	Procedure for Obtaining a 14.4 ml Gas Sample and an Iodine/Particulate Sample Simultaneously

EP-231-4 - Procedure for Obtaining a Small Volume Liquid Sample

EP-231-5 - Procedure for Monitoring Total Dissolved Gas (and, if desired, Obtaining a Dissolved Gas Sample) and/or Obtaining a Large Volume Liquid Sample.

2.4.6 Once the H.P. technician has surveyed the sample cask, take the sample to the hot lab retracing the route back from the sample point.

2.4.7 Upon introduction of the sample into the hot lab, the sample will be handled and stored in a manner that personnel exposures are kept ALARA.

2.4.8 Contact the Group Leader as soon as the sample reaches the hot lab and inform him that the sample collection has been completed and what the sample status is.

3.0 ACTIONS - FOLLOWUP

3.1 Chemistry Sampling and Analysis Team Leader shall:

3.1.1 Report the results to the Emergency Director and the Health Physics and Chemistry Coordinator (EOF).

3.2 Chemistry Sampling and Analysis Group Leader shall:

3.2.1 Notify Shift Supervision that a sample has been taken and the aligned valves may be returned to the "NORMAL" position.

3.2.2 Have group member(s) dose monitored to ensure that exposure limits have not been exceeded.

3.2.3 Inform the Chemistry Sampling and Analysis Team Leader that the required sample is in the hot lab.

3.2.4 Instruct the group members to perform calculations (if any) on the Data Sheet of the appropriate Appendix.

3.2.5 Obtain pass key from Group member.

3.2.6 Instruct the appropriate group members to refer to the appropriate procedure for guidance on sample preparation and handling.

Sample	Procedure No.
Liquid (EP-241)	Sample Preparation and Handling of Highly Radioactive Liquid Samples
Iodine (EP-242) (Particulate)	Sample Preparation and Handling of Highly Radioactive Particulate Filters and Iodine Cartridges
Gas (EP-243)	Sample Preparation and Handling of Highly Radioactive Gas Samples

3.2.7 Obtain and review ALL Data Sheets and report the sample results to the Chemistry Sampling and Analysis Team Leader and attach all Data Sheets to Appendix EP-230-2.

3.3 Chemistry Sampling and Analysis Group members shall:

3.3.1 Complete the appropriate Appendix Data Sheet(s) when applicable.

3.3.2 Prepare, handle, and analyze the sample using the appropriate procedure.

3.3.3 Report the results to the Chemistry Sampling and Analysis Group Leader.

3.3.4 Return sampling equipment to the CHEMISTRY EMERGENCY CABINET, if applicable.

3.3.5 Return CHEMISTRY EMERGENCY CABINET and CHEMISTRY EMERGENCY SUPPLIES Tool Box Keys to the appropriate control point.

4.0 APPENDICES

4.1 EP-231-1 Procedure for Obtaining a 14.4 ml Gas Sample.

4.2 EP-231-2 Procedure for Obtaining an Iodine/Particulate Sample.

4.3 EP-231-3 Procedure for Obtaining a 14.4 ml Gas Sample and an Iodine/Particulate Sample Simultaneously.

4.4 EP-231-4 Procedure for Obtaining a Small Volume Liquid Sample

4.5 EP-231-5 Procedure for Monitoring Total Dissolved Gas (and, if desired, Obtaining a Dissolved Gas Sample) and/or Obtaining a Large Volume Liquid Sample.

4.6 EP-231-6 M-102 General Arrangement Plan at El. 217'-0"

4.7 EP-231-7 Diagram of Control Panel-left side.

4.8 EP-231-8 Diagram of Control Panel-right side.

4.9 EP-231-9 Control Panel Switch Layout

4.10 EP-231-10 Schematic of Post Accident Sample Station

5.0 SUPPORTING INFORMATION

5.1 Purpose - The purpose of this procedure is to provide guidelines for obtaining samples from the Post-Accident Sampling Station following accident conditions.

5.2 Criteria for use

5.2.1 Prior to entering the plant to obtain the sample, ensure that the Post Accident Sample Station is operable by verifying that RT-5-030-800-0, POST ACCIDENT SAMPLE STATION OPERABILITY TEST, was successfully performed in the previous six months.

5.2.2 This procedure shall be implemented when a sample shall be taken from the PASS during an emergency situation.

5.2.3 Planned radiation exposures should be limited to the administrative guide levels in Appendix EP-230-1, Emergency Exposure Guidelines.

5.2.4 There is no automatic drain or blow down but there is an alarm light to indicate that the level in the trap T-717 is high and that the trap needs to be drained right away. This trap removes water from the gas sample lines. If the liquid level becomes too high, water will be sucked into the gas breakdown pump and mechanical damage may result.

5.3 Special equipment

5.3.1 Gas vial sample tube

5.3.2 Iodine & particulate sample assembly

5.3.3 14.4 ml gas vials and caps

5.3.4 Liquid sample bottles and caps

5.3.5 10cc syringe with luer-lok fitting

5.3.6 Silver zeolite cartridges

5.3.7 47mm particulate filters (Gelman)

5.3.8 Small bottle of demin water

5.3.9 Large volume cask

5.3.10 Small volume cask

5.3.11 Gas sample cask

5.3.12 Flashlight

5.3.13 Mirror

5.3.14 Watch with secondhand or stopwatch

5.3.15 Plastic bags

5.3.16 PASS carrying box

5.3.17 Copy of EP-231-Operation of Post-Accident Sampling Systems (PASS)

5.3.18 Blank Data Sheets

5.3.19 Portable Communication Equipment (if available)

5.3.20 Clip Board

5.3.21 Pens, Pencils, etc.

5.3.22 Towels

5.3.23 Control Panel Power Key

5.3.24 Ramp for Large Volume Case

5.3.25 Scissors

5.4 References

5.4.1 EP-230 - Chemistry Sampling and Analysis Team Activation

5.4.2 M-102 - General Arrangement Plan at El. 217'-0"

5.4.3 M-30, Rev. 7 - Post Accident Sampling P&ID

5.4.4 M-42, Proposed Rev. 19 - Nuclear Boiler Vessel Instrumentation

5.4.5 M-51, Sht. 1 - Rev. 29, Sht. 2 - Rev. 29, Residual Heat Removal P&ID

5.4.6 M-57- Sht. 1 - Rev. 19, Containment Atmosphere Control P&ID

5.4.7 M1-D24-Z00 1, Vol. I & II, GEK83344, Operation and Maintenance Instructions - PASS, Vol. I & II

5.4.8 A-107, Rev. 30, Architectural Floor Plan at Elevation 217'-0".

APPENDIX EP-231-1

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE

1. Ensure that the nitrogen supply valves are open and that the pressure is set at 100 psig by opening the following valves: (Sign-off Required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

2. Ensure that the Demineralized Flush Water Tank OOT 945 is full and is pressurized at 100 psig and the following valves are open to the sample station: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

If Demin Tank not filled, first close all valves opened in steps 1 and 2, then open valves 30-0011 and 30-0015, verify that valve 30-0014 is open, remove the plug on the Hydro Test Tap by valve 30-0015, and SLOWLY open valve 30-0010. Continue flow until water appears at the test tap. Close valve 30-0010 FIRST, then close valves 30-0011 and 30-0015. Replace the Test Tap plug and secure. Return to Step No. 1.

3. Verify that the damper is open (half-way) to Secondary Containment.

4. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

5. Turn all control panel switches "OFF" (except HC-723, place in position 4 "SPARE") and then TURN the Control Panel Power Selector Switch HC-600 to "A" (Alternate "B").

APPENDIX EP-231-1 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE

6. Turn the Liquid or Gas Selector Switch to Liquid.

7. Turn Flush System Switch HC-628-1 counterclockwise to position 6 and HC-626 to position 1 (Jet Pump) and observe that approximately 0.3 gpm flow per FI-664 is occurring and providing a positive indication that the discharge line to the Suppression Pool is open.

8. After being assured that the discharge line to the suppression pool is open, drain Collector Tank, Trap and Sump by turning Switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

9. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

10. With the Drain System Switch (HC-715-1) in the "OFF" position, place Switch HC-700 (liquid/gas selector) in the "GAS" position. Ensure N2 bottle valves are open and regulated to approximately 100 psig.

11. Ensure the Chiller E-703 is on.

12. Quickly inspect the needle in the gas port to determine that its condition is satisfactory for obtaining a sample.

    IN THE FOLLOWING STEP, ONLY TIGHTEN THE IODINE CARTRIDGE DRAWER UNTIL THE "CARTRIDGE IN" LIGHT TURNS GREEN AND NO FURTHER.

13. If a particulate/iodine sample will be obtained later, make sure that the desired filter and cartridges are properly installed (including "O" rings) in the cartridge retainer. Install the gas filter drawer into position. Verify that the "CARTRIDGE IN" light is green.

14. Turn Switch HC-723 (GAS SAMPLE SELECTOR SWITCH) to the desired sample location:

POSITION	LOCATION
1	Drywell Atmosphere
2	Suppression Pool Atmosphere
3	Secondary Containment Atmosphere
4	Spare

APPENDIX EP-231-1 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE

15. Open the respective Reactor system valve in the gas sample line as follows:

SAMPLE LOCATION	SWITCH NAME	POSITION
* Upper Drywell ATM. (291')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	DRYWELL
* Lower Drywell ATM. (242')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-147A/SV57-147B	DRYWELL
* Suppression Pool ATM. (222') (250 Deg Azimuth from North)	SUP POOL/DRYWELL TO POST ACDT SAMP SV57-147A/SV57-147B	SUPP POOL
* Suppression Pool ATM. (222') (70 Deg Azimuth from North)	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	SUPP POOL
Secondary Containment ATM.	No Line-up Necessary	

* Verify that the light changes from green to red.

16. Place a standard 14.4 milliliter off gas vial into the gas vial positioner, slide the positioner into the gas port. Observe that the "Bottle In" status light changes from red to green. If the light does not change to green, reposition the bottle.

17. Turn the "15 ml Gas Sample Switch" HC-705 to position 2 and circulate gas for the appropriate time:

Sample	Time (min)
Drywell Atmosphere	23
Suppression Pool Atmosphere	17
Secondary Containment Atmosphere	9

Be sure that the flow as read by the rotameter (FI-725) thru the sample enclosure window is greater than 10 SLPM. Record flow and flush duration on data sheet.

APPENDIX EP-231-1 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE

18. Turn HC-705 to position 3 and evacuate the off gas vial. Record pressure as P1 from PI-708 of the evacuated vial on the data sheet. Make sure the vacuum in the gas vial reaches a stable minimum reading.

19. Turn HC-705 to position 4, "TAKE SAMPLE". Verify that pressure (PI-708) does not change significantly. If the pressure changes significantly, it may indicate a system leak. Therefore, turn Switch HC-705 counter clockwise to position 2. Remove the sample vial and place in a plastic bag for transportation to the hot lab. Place a new 14.4 ml off gas sample vial into the gas positioner and return to Step 5.

20. Press the HC-720 button to obtain the sample. Keep button depressed until a steady pressure is reached (approximately 5 seconds). Record pressure as P2 from PI-708 on data sheet. This pressure should correspond to actual pressure of sample being obtained. Record sample temperature from TI-724 on data sheet.

21. Turn HC-705 to position 5 "FLUSH SYSTEM" and flush for approximately 1 minute.

22. Turn HC-705 clockwise to "OFF".

23. Turn Switch SV57-147A/SV57-147B or SV57-146A/SV57-146B (if opened in Step 14) to the CLOSE position.

24. Wearing cotton liners and gloves, and observing ALARA practices, withdraw the gas vial positioner and immediately have the HP technician survey the gas sample vial and record the Initial Contact Dose Rate on the Data Sheet. Keep the vial at the maximum distance from the individual and quickly insert the sample bottle into the gas vial cask. Close and latch the gas vial cask. Put a stopper or the gas vial positioner back into the port in the sample station.

25. Turn HC-700 (Liquid/Gas Selector) to the LIQUID position.

26. Turn Flush Sytem HC-628-1 counterclockwise to position 6 and HC-626 to position 1 and observe that approximately 0.3 gpm flow per FI-664 is occuring. Leave in this position for 45 minutes then turn to OFF.

27. Drain Collector Tank, Trap and Sump by turning switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

28. Turn HC-626 to "OFF" First and then HC-628-1 to "OFF".

29. Close FCV-627 to 0 psig by turning counterclockwise.

APPENDIX EP-231-1 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE

30. Close the nitrogen supply valves opened in Step No. 1: (Sign-off required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve 30-0022	_____		Isolation Valve 30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

31. Close the Demin Water Tank valves opened in Step No. 2: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

32. Close the damper.

33. Turn the Chiller E-703 OFF.

34. Turn all switches (except for HC-723 which is left in position 4) to their "OFF" position.

APPENDIX EP-231-1

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE (CONT)

Data Sheet for 14.4 ML Gas Sample

DESIRED ANALYSIS

A._____

B._____

C._____

1. Sample Source _____ Date _____ Time _____
2. Sample Flow _____ FI-725 (SLPM)
3. Flush Duration _____ (Min.)
4. Absolute Pressure of Vial (P1)_____ PI-708 (PSIA)
5. Final Sample Pressure (P2)_____ PI-708 (PSIA)
6. Sample Temperature _____ TI-724 (F)
7. Calculated Sample Volume (ML) Corrected to STP

   $$\text{Vol @ STP} = \frac{(P2-P1)(14.4\ \text{ml})(492\ \text{deg. R})}{(T + 460\ \text{deg. R})(14.7\ \text{PSIA})}$$

   = _____ ml @ STP
8. Initial Contact Dose Rate _____(mR)

Name_____

APPENDIX EP-231-2

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE

1. Ensure that the nitrogen supply valves are open and that the pressure is set at 100 psig by opening the following valves: (Sign-off Required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank	
30-0017	_____

2. Ensure that the Demineralized Flush Water Tank OOT 94[illegible] is full and is pressurized at 100 psig and the following valves are open to the sample station: (Sign-off required)

30-0014	_____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

If Demin Tank not filled, then close all valves opened in steps 1 and 2, then open valves 30-0011 and 30-0015, verify that valve 30-0014 is open, remove the plug on the Hydro Test Tap by valve 30-0015, and SLOWLY open valve 30-0010. Continue flow until water appears at the test tap. Close valve 30-0010 FIRST, then close valves 30-0011 and 30-0015. Replace the Test Tap plug and secure. Return to Step No. 1

3. Verify that the damper is open (half-way) to Secondary Containment.

4. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

5. Turn all control panel switches "OFF" (except HC-723, place in position 4 "SPARE") and then TURN the Control Panel Power Selector Switch HC-600 to "A" (Alternate "B").

APPENDIX EP-231-2 (CONT'D)

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE

6. Turn the Liquid or Gas Selector Switch to Liquid.

7. Turn Flush System Switch HC-628-1 counterclockwise to position 6 and HC-626 to position 1 (Jet Pump) and observe that approximately 0.3 gpm flow per FI-664 is occurring and providing a positive indication that the discharge line to the Suppression Pool is open.

8. After being assured that the discharge line to the suppression pool is open, drain Collector Tank, Trap and Sump by turning Switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

9. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

10. Verify that HC-715-1 DRAIN SYSTEM SWITCH is in the "OFF" position. Place Switch HC-700 (LIQUID/GAS SELECTOR) in the "GAS" position.

    IN THE FOLLOWING STEP, ONLY TIGHTEN THE IODINE CARTRIDGE DRAWER UNTIL THE "CARTRIDGE IN" LIGHT TURNS GREEN AND NO FURTHER.

11. If the gas filter drawer is already in place and there is any doubt about the desired filters and cartridges being in place, pull the drawer and check the filters and cartridge(s). Put the desired filter cartridge(s) into the cartridge retainer, put the cartridge retainer into the gas filter drawer including "O" rings and put the drawer into the sample station and verify that the "CARTRIDGE IN" light is green. If not, reposition the drawer.

12. Decide whether a timed or non-timed sample is desired and record. Generally speaking, if a high activity condition exists or is suspected, a timed sample should be taken. For a timed sample, set the Timer KC-712 between the range of 0 to 30 seconds. Select a low enough time so that the activity on the filter cartridge will not be unnecessarily high and cause special handling problems. Observe the RI-704 reading to determine if there is a rapid activity buildup. Set the Switch HC-704 located to the left of the timer labeled TIME SAMPLE on either YES or NO.

13. Adjust PCV-30-127 to 2 psi (located in back of Control Panel).

14. Turn the Chiller E-703 ON.

APPENDIX EP-231-2 (CONT'D)

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE

15. Turn the GAS SAMPLE SELECTOR SWITCH (HC-723) to the desired sample source.

SAMPLE SOURCE	POSITION
Drywell Atmosphere	1
Suppression Pool Atmosphere	2
Secondary Containment Atmosphere	3
Spare	4

16. Open the respective Reactor system valve in the gas sample line for the appropriate sample as follows:

SAMPLE LOCATION	SWITCH NAME	POSITION
* Upper Drywell ATM. (291')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	DRYWELL
* Lower Drywell ATM. (242')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-147A/SV57-147B	DRYWELL
* Suppression Pool ATM. (222') (250 Deg Azimuth from North)	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-147A/SV57-147B	SUPP POOL
* Suppression Pool ATM. (222') (70 Deg Azimuth from North)	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	SUPP POOL
Secondary Containment ATM.	No Line-up Necessary	

* Verify that the light changes from green to red.

17. Turn the IODINE CARTRIDGE SAMPLE SWITCH HC-712 to position 2 and circulate gas for the appropriate time:

SAMPLE	TIME (MIN)
Drywell Atmosphere	23
Suppression Pool Atmosphere	17
Secondary Containment Atmosphere	9

APPENDIX EP-231-2

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE (CONT)

18. Be sure the flow as read by the rotometer which is visible thru the window in the sample station enclosure is greater than 10 SLPM. Record the flow (FI-725), temperature (TI-724) and pressure (PI-726 and PI-727) on the data sheet. The two pressure gages (PI-726 and PI-727), as read thru the window, should be the same.

19. Turn HC-712 to position 3. The sample gas will start to flow through the filter cartridge. On the DATA SHEET record PI-727, PI-726, FI-725, the flow duration in seconds and RI-704. After the timer has timed out for a timed sample or after the predetermined time has elapsed for a non-timed sample, verify critical flow by completing the appropriate sections of the Data Sheet.

20. Turn Selector Switch HC-712 to position 4 for 10 seconds to evacuate the filter cartridge. A vacuum will be quickly drawn on the system.

21. Turn Switch HC-712 to position 5 which will admit a nitrogen flush through the filter cartridge to remove Krypton and Xenon gases. This purge should last approximately 20 seconds or until RI-704 is stable. Record the final radiation, RI-704.

22. Rotate HC-712 clockwise to the "OFF" position. Turn other switches (except HC-600) to the "OFF" positions. Remove cartridge retainer and immediately survey the cartridge retainer and record the Initial Contact Dose Rate on the Data Sheet and put the cartridge retainer in a plastic bag. Tape bags closed. If available, install a new cartridge retainer complete with filter paper and iodine cartridges. Put drawer back into sample enclosure. Place the sample into a transport cask.

23. Turn Switch SV57-147A/SV57-147B or SV57-146A/SV57-146B opened in Step 15 to the CLOSE position.

24. Turn HC-700 (Liquid/Gas Selector) to the LIQUID position.

25. Turn Flush Sytem HC-628-1 counterclockwise to position 6 and HC-626 to position 1 and observe that approximately 0.3 gpm flow per FI-664 is occuring. Leave in this position for 5 minutes then turn to OFF.

APPENDIX EP-231-2

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE (CONT)

26. Drain Collector Tank, Trap and Sump by turning switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

27. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

28. Close FCV-627 to 0 psig by turning counterclockwise.

29. Close the nitrogen supply valves opened in Step No. 1: (Sign-off required).

N2 Bottle 1			N2 Bottle 2	
Bottle Valve PCV-30-074	_____	*OR*	Bottle Valve PCV-30-073	_____
Isolation Valve 30-0022	_____		Isolation Valve 30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

30. Close the Demin Water Tank valves opened in Step No. 2: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

31. Close the damper.

32. Turn the Chiller E-703 OFF.

33. Turn all switches (except for HC-723 which is left in position 4) to their "OFF" position.

APPENDIX EP-231-2

PROCEDURE FOR OBTAINING IODINE/PARTICULATE SAMPLE (CONT)

Data Sheet for Iodine/Particulate Sample

DESIRED ANALYSIS

A._____

B._____

ESTIMATED SAMPLING TIME _____

1. Sample Source _____ Date _____ Time _____
2. Orifice Size 3.0 lpm
3. Timed Sample Yes or No _____
4. Flush Time in Minutes _____
5. Sample Flow _____ FI-725 (slpm) (not thru cartridge)
6. Temperature _____ TI-724 (F)
7. Pressure _____ PI-726 (PSIG or "Hg)
8. Pressure _____ PI 727 (PSIG or "Hg)
9. Pressure _____ PI-726 (PSIG or "Hg)
10. Pressure _____ PI-727 (PSIG or "Hg)
11. Flow _____ FI-725 (slpm) (flow thru cartridge)
12. Flow Duration _____ seconds
13. Radiation _____ RI-704 (mR/hr)
14. Final Radiation _____ RI-704 (mR/hr)
15. Initial Contact Dose Rate _____(mR/hr)

Name _____

APPENDIX EP-231-2
DATA SHEET FOR IODINE/PARTICULATE SAMPLE VERIFICATION OF CRITICAL FLOW

For the Upstream Pressure Found on PI-726, verify Critical Flow through the Iodine Cartridge by having the corresponding value or greater vacuum on the downstream pressure gage PI-727 as given below.

9. UPSTREAM PRESSURE PI-726 _____ PSIG or "Hg	10. DOWNSTREAM PRESSURE PI-727 _____ PSIG OR "Hg
11 "Hg	21 "Hg
10 "Hg	20 "Hg
9 "Hg	20 "Hg
8 "Hg	19 "Hg
7 "Hg	19 "Hg
6 "Hg	18 "Hg
5 "Hg	18 "Hg
4 "Hg	17 "Hg
3 "Hg	17 "Hg
2 "Hg	16 "Hg
1 "Hg	16 "Hg
0 PSIG	16 "Hg
1 PSIG	15 "Hg
2 PSIG	13 "Hg
3 PSIG	12 "Hg
4 PSIG	11 "Hg
5 PSIG	10 "Hg
6 PSIG	9 "Hg
7 PSIG	8 "Hg
8 PSIG	7 "Hg
9 PSIG	6 "Hg
10 PSIG	5 "Hg
11 PSIG	4 "Hg
12 PSIG	3 "Hg
13 PSIG	2 "Hg
14 PSIG	1 "Hg
15 PSIG	0 PSIG
16 PSIG	0 PSIG
17 PSIG	1 PSIG
18 PSIG	1 PSIG
19 PSIG	2 PSIG
20 PSIG	2 PSIG
21 PSIG	3 PSIG
22 PSIG	3 PSIG
23 PSIG	4 PSIG
24 PSIG	4 PSIG
25 PSIG	5 PSIG
26 PSIG	5 PSIG
27 PSIG	6 PSIG
28 PSIG	6 PSIG
29 PSIG	7 PSIG
30 PSIG	7 PSIG

Critical Flow _____ (Yes/No)

NOTE: When critical flow is obtained through the cartridge assembly, a flow of 3.0 liters per minute ± 15% is achieved.

APPENDIX EP-231-3

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

1. Ensure that the nitrogen supply valves are open and that the pressure is set at 100 psig by opening the following valves: (Sign-off Required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

2. Ensure that the Demineralized Flush Water Tank OOT 945 is full and is pressurized at 100 psig and the following valves are open to the sample station: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

If Demin Tank not filled, first close all valves opened in steps 1 and 2, then open valves 30-0011 and 30-0015, verify that valve 30-0014 is open, remove the plug on the Hydro Test Tap by valve 30-0015, and SLOWLY open valve 30-0010. Continue flow until water appears at the test tap. Close valve 30-0010 FIRST, then close valves 30-0011 and 30-0015. Replace the Test Tap plug and secure. Return to Step No. 1.

3. Verify that the damper is open (half-way) to Secondary Containment.

4. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

5. Turn all control panel switches "OFF" (except HC-723, place in position 4 "SPARE") and then TURN the Control Panel Power Selector Switch HC-600 to "A" (Alternate "B").

6. Turn the Liquid or Gas Selector Switch to Liquid.

APPENDIX EP-231-3

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

7. Turn Flush System Switch HC-628-1 counterclockwise to position 6 and HC-626 to position 1 (Jet Pump) and observe that approximately 0.3 gpm flow per FI-664 is occurring and providing a positive indication that the discharge line to the Suppression Pool is open.

8. After being assured that the discharge line to the suppression pool is open, drain Collector Tank, Trap and Sump by turning Switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

9. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

10. With the Drain System Switch (HC-715-1) in the "OFF" position, place Switch HC-700 (liquid/gas selector) in the "GAS" position.

11. Ensure the Chiller E-703 is on.

12. Quickly inspect the needle in the gas port to determine that its condition is satisfactory for obtaining a sample.

    IN THE FOLLOWING STEP, ONLY TIGHTEN THE IODINE, CARTRIDGE DRAWER UNTIL THE "CARTRIDGE IN" LIGHT TURNS GREEN AND NO FURTHER.

13. If the gas filter drawer is already in place and there is any doubt that the desired filters being in place, pull the drawer and check the filter and cartridge(s). Put the desired filter cartridge(s) into the cartridge retainer, put the cartridge retainer into the gas filter drawer including "O" rings and put the drawer into the sample station and verify that the "CARTRIDGE IN" light is green. If not, reposition the drawer.

14. Decide whether a timed or non-timed sample is desired and record. Generally speaking, if a high activity condition exists or is suspected, a timed sample should be taken. For a timed sample, set the Timer KC-712 between the range of 0 to 30 seconds. Select a low enough time so that the activity on the filter cartridge will not be unnecessarily high and cause special handling problems. Observe the RI-704 reading to determine if there is a rapid activity buildup. Set the Switch HC-704 located to the left of the timer labeled TIME SAMPLE on either YES or NO.

APPENDIX EP-231-3 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

15. Adjust PCV-30-127 to 2 psi (located in back of Control Panel).

16. Turn Switch HC-723 (GAS SAMPLE SELECTOR SWITCH) to the desired sample location:

POSITION	LOCATION
1	Drywell Atmosphere
2	Suppression Pool Atmosphere
3	Secondary Containment Atmosphere
4	Spare

17. Open the respective Reactor system valve in the gas sample line as follows:

SAMPLE LOCATION	SWITCH NAME	POSITION
* Upper Drywell ATM. (291')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	DRYWELL
* Lower Drywell ATM. (242')	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-147A/SV57-147B	DRYWELL
* Suppression Pool ATM. (222') (250 Deg Azimuth from North)	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-147A/SV57-147B	SUPP POOL
* Suppression Pool ATM. (222') (70 Deg Azimuth from North)	SUP POOL/DRYWELL AIR TO POST ACDT SAMP SV57-146A/SV57-146B	SUPP POOL
Secondary Containment ATM.	No Line-up Necessary	

* Verify that the light changes from green to red.

18. Place a standard 14.4 milliliter off gas vial into the gas vial positioner, slide the positioner into the gas port. Observe that the "Bottle In" status light changes from red to green. If the light does not change to green, reposition the bottle.

APPENDIX EP-231-3 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

19. Turn the "15 ml Gas Sample Switch" HC-705 to position 2 and circulate gas for the appropriate time:

SAMPLE	TIME (MIN)
Drywell Atmosphere	23
Suppression Pool Atmosphere	17
Secondary Containment Atmosphere	9

Be sure that the flow as read by the rotameter (FI-725) thru the sample enclosure window is greater than 10 SLPM. Record flow and flush duration on data sheet.

20. Turn HC-705 to position 3 and evacuate the off gas vial. Record pressure as P1 from PI-708 of the evacuated vial on the data sheet. Make sure the vacuum in the gas vial reaches a stable minimum reading.

21. Turn HC-705 to position 4, "TAKE SAMPLE". Verify that pressure (PI-708) does not change significantly. If the pressure changes significantly, it may indicate a system leak. Therefore, turn Switch HC-705 counter clockwise to position 2. Remove the sample vial and place in a plactic bag for transportation to the hot lab. Place a new 14.4 ml off gas sample vial into the gas positioner and return to Step 5.

22. Press the HC-720 button to obtain the sample. Keep button depressed until a steady pressure is reached (approximately 5 seconds). Record pressure as P2 from PI-708 on data sheet. This pressure should correspond to actual pressure of sample being obtained. Record sample temperature from TI-724 on data sheet.

23. Turn HC-705 to position 5 "FLUSH SYSTEM" and flush for approximately 1 minute.

24. Turn HC-705 clockwise to "OFF".

25. Wearing cotton liners and gloves, and observing ALARA practices, withdraw the gas vial positioner and immediately have the HP technician survey the gas sample vial and record the Initial Contact Dose Rate on the Data Sheet. Keep the vial at the maximum distance from the individual and quickly insert the sample bottle into the gas vial cask. Close and latch the gas vial cask. Put a stopper or the gas vial positioner back into the port in the sample station.

APPENDIX EP-231-3 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

26. Turn the IODINE CARTRIDGE SAMPLE SWITCH HC-712 to position 2 and circulate gas for the appropriate time:

SAMPLE	TIME (MIN)
Drywell Atmosphere	23
Suppression Pool Atmosphere	17
Secondary Containment Atmosphere	9

27. Be sure the flow as read by the rotometer which is visible thru the window in the sample station enclosure is greater than 10 SLPM. Record the flow (FI-725), temperature (TI-724) and pressure (PI-726 and PI-727) on the data sheet. The two pressure gages (PI-726 and PI-727), as read thru the window, should be the same.

28. Turn HC-712 to position 3. The sample gas will start to flow through the fiter cartridge. On the DATA SHEET record PI-727, PI-726, FI-725, the flow duration in seconds and RI-704. After the timer has timed out for a timed sample or after the predetermined time has elapsed for a non-timed sample, verify critical flow by completing the appropriate section of the Data Sheet.

29. Turn Selector Switch HC-712 to position 4 for 10 seconds to evacuate the filter cartridge. A vacuum will be quickly drawn on the system.

30. Turn Switch HC-712 to position 5 which will admit a nitrogen flush through the filter cartridge to remove Krypton and Xenon gases. This purge should last approximately 20 seconds or until RI-704 is stable. Record the final radiation, RI-704.

31. Rotate HC-712 clockwise to the "OFF" position. Turn other switches (except HC-600) to the "OFF" positions. Remove cartridge retainer and immediately survey the cartridge retaininer and record the Initial Contact Dose Rate on the Data Sheet and put the cartirdge retainer in a plastic bag. Tape bags closed. If available, install a new cartridge retainer complete with filter paper and iodine cartridges. Put drawer back into sample enclosure. Place the sample into a transport cask.

32. Turn Switch SV57-147A/SV57-147B or SV57-146A/SV57-146B opened in Step 16 to the CLOSE position.

APPENDIX EP-231-3 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

33. Turn HC-700 (Liquid/Gas Selector) to the LIQUID position.

34. Turn Flush Sytem HC-628-1 counterclockwise to position 6 and HC-626 to position 1 and observe that approximately 0.3 gpm flow per FI-664 is occuring. Leave in ths position for 5 minutes then turn to OFF.

35. Drain Collector Tank, Trap and Sump by turning switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

36. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

37. Close FCV-627 to 0 psig by turning counterclockwise.

38. Close the nitrogen supply valves opened in Step No. 1: (Sign-off required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

39. Close the Demin Water Tank valves opened in Step No. 2: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

APPENDIX EP-231-3 (CONT'D)

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

40. Close the damper.

41. Turn the Chiller E-703 OFF.

42. Turn all switches (except for HC-723 which is left in position 4) to their "OFF" position.

APPENDIX EP-231-3

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

Data Sheet for 14.4 ML Gas Sample

DESIRED ANALYSIS

A._____

B._____

C._____

1. Sample Source _____ Date _____ Time _____
2. Sample Flow _____ FI-725 (SLPM)
3. Flush Duration _____ (Min.)
4. Absolute Pressure of Vial (P1)_____ PI-708 (PSIA)
5. Final Sample Pressure (P2)_____ PI-708 (PSIA)
6. Sample Temperature _____ TI-724 (F)
7. Calculated Sample Volume (ML) Corrected to STP

$$\text{Vol @ STP} = \frac{(P2-P1)(14.4\ \text{ml})(492\ \text{deg. R})}{(T - 460\ \text{deg. R})(14.7\ \text{PSIA})}$$

= ml @ STP

8. Initial Contact Dose Rate _____(mR)

DATA SHEET FOR IODINE/PARTICULATE SAMPLE

DESIRED ANALYSIS

A._____

B._____

ESTIMATED SAMPLING TIME _____

1. Sample Source _____ Date _____ Time _____
2. Orifice Size 3.0 lpm
3. Timed Sample Yes or No _____
4. Flush Time in Minutes _____

APPENDIX EP-231-3

PROCEDURE FOR OBTAINING A 14.4 ML GAS SAMPLE AND AN IODINE/PARTICULATE SAMPLE SIMULTANEOUSLY

DATA SHEET FOR IODINE/PARTICULATE SAMPLE

5. Sample Flow _____ FI-725 (not thru cartridge) (slpm)
6. Temperature _____ TI-724 (F)
7. Pressure _____ PI-726 (PSIG or "Hg)
8. Pressure _____ PI 727 (PSIG or "Hg)
9. Pressure _____ PI-726 (PSIG or "Hg)
10. Pressure _____ PI-727 (PSIG or "Hg)
11. Flow _____ FI-725 (slpm) (flow thru cartridge)
12. Flow Duration _____ seconds
13. Radiation _____ RI-704 (mR/hr)
14. Final Radiation _____ RI-704 (mR/hr)
15. Initial Contact Dose Rate _____(mR/hr)

Name _____

APPENDIX EP-231-3
DATA SHEET FOR IODINE/PARTICULATE SAMPLE VERIFICATION OF CRITICAL FLOW

For the Upstream Pressure Found on PI-726, verify Critical Flow through the Iodine Cartridge by having the corresponding value or greater vacuum on the downstream pressure gage PI-727 as given below.

9. UPSTREAM PRESSURE PI-726 _____ PSIG or "Hg	10. DOWNSTREAM PRESSURE PI-727 _____ PSIG OR "Hg
11 "Hg	21 "Hg
10 "Hg	20 "Hg
9 "Hg	20 "Hg
8 "Hg	19 "Hg
7 "Hg	19 "Hg
6 "Hg	18 "Hg
5 "Hg	18 "Hg
4 "Hg	17 "Hg
3 "Hg	17 "Hg
2 "Hg	16 "Hg
1 "Hg	16 "Hg
0 PSIG	16 "Hg
1 PSIG	15 "Hg
2 PSIG	13 "Hg
3 PSIG	12 "Hg
4 PSIG	11 "Hg
5 PSIG	10 "Hg
6 PSIG	9 "Hg
7 PSIG	8 "Hg
8 PSIG	7 "Hg
9 PSIG	6 "Hg
10 PSIG	5 "Hg
11 PSIG	4 "Hg
12 PSIG	3 "Hg
13 PSIG	2 "Hg
14 PSIG	1 "Hg
15 PSIG	0 PSIG
16 PSIG	0 PSIG
17 PSIG	1 PSIG
18 PSIG	1 PSIG
19 PSIG	2 PSIG
20 PSIG	2 PSIG
21 PSIG	3 PSIG
22 PSIG	3 PSIG
23 PSIG	4 PSIG
24 PSIG	4 PSIG
25 PSIG	5 PSIG
26 PSIG	5 PSIG
27 PSIG	6 PSIG
28 PSIG	6 PSIG
29 PSIG	7 PSIG
30 PSIG	7 PSIG

Critical Flow _____ (Yes/No)

NOTE: When critical flow is obtained through the cartridge assembly, a flow of 3.0 liters per minute ± 15% is achieved.

APPENDIX EP-231-4

PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE

IF A SAMPLE IS TO BE OBTAINED FROM THE JET PUMP (JET PUMP 4 SENSING LINE), THERE EXISTS THE POSSIBILITY OF EXCESS FLOW CHECK VALVE XV-42-1F059H TRIPPING WHICH WILL REQUIRE MANUAL RESETTING BY OPERATIONS. THE ALARMS ARE LOCATED ON LOCAL PANEL 10C228 (20C228) AND MAIN CONTROL BOARD ANNUNCIATOR 1BC802-35 (2BC802-35) (EXCESS FLOW CHECK VALVE OPERATED PANEL C228). IF AT ANY TIME WHILE SAMPLING AN INDICATION OF DECREASING FLOW (FCV627 on FI-664) AND/OR DECREASING PRESSURE (PI661) IS NOTICED, CONTACT THE CONTROL ROOM AND REQUEST MONITORING OF THESE ANNUNCIATORS.

1. Ensure that the nitrogen supply valves are open and that the pressure is set at 100 psig by opening the following valves: (Sign-off Required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

2. Ensure that the Demineralized Flush Water Tank OOT 945 is full and is pressurized at 100 psig and the following valves are open to the sample station: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

If Demin Tank not filled, first close all valves opened in steps 1 and 2, then open valves 30-0011 and 30-0015, verify that valve 30-0014 is open, remove the plug on the Hydro Test Tap by valve 30-0015, and SLOWLY open valve 30-0010. Continue flow until water appears at the test tap. Close valve 30-0010 FIRST, then close valves 30-0011 and 30-0015. Replace the Test Tap plug and secure. Return to Step No. 1.

APPENDIX EP-231-4

PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE

3. Verify that the damper is open (half-way) to Secondary Containment.

4. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

5. Turn all control panel switches "OFF" (except HC-723, place in position 4 "SPARE") and then TURN the Control Panel Power Selector Switch HC-600 to "A" (Alternate "B").

6. Turn the Liquid or Gas Selector Switch to Liquid.

7. Turn Flush System Switch HC-628-1 counterclockwise to position 6 and HC-626 to position 1 (Jet Pump) or position 5 (RHR) and observe that approximately 0.3 gpm flow per FI-664 is occurring and providing a positive indication that the discharge line to the Suppression Pool is open.

8. After being assured that the discharge line to the suppression pool is open, drain Collector Tank, Trap and Sump by turning Switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

9. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

10. Load the syringe with 10cc of demineralized water. Place the stopcock on the syringe and load the assembly onto the injection port.

11. Remove lead stopper and carrying handle from the small cask by unscrewing it and lifting it out. Leave stopper near by.

    USE APPROPRIATE ANTI-C CLOTHING AND GOGGLES IF DIRECTLY INSPECTING THE SAMPLE NEEDLES BELOW THE SAMPLE STATION.

12. Make certain the lead shielding drawer is out so that the needles under the sample station enclosure are exposed. Quickly inspect the needles with a mirror and flashlight. Check that the shaft of the needle is towards the center of the sample vial.

APPENDIX EP-231-4
PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE (CONT)

13. Put a wide mouth liquid sample bottle with an outer aluminum retainer ring and septum into the small volume cask. Check that the bottle lifting lever is free to move up and down. The bottle must fit snugly in the holder and be vertically aligned. If the bottle does not fit snugly, use a small pad of rubber or felt, thick enough to hold vial against the upper yoke of the vial holder and/or attach the bottle to the vial holder with Velcro tape.

14. Check that the small volume cask is in the cask positioner, and that both are hanging from the hooks below the sample station.

    CAUTION: THE LEAD SHIELDING DRAWER WEIGHS APPROXIMATELY 70 POUNDS.

15. Swing the cask into position under the sample station (ensure notches of positioner are located on the inside of the sample enclosure frame) and lock the arms of the cask holder so the cask and bottle will remain in position.

16. Turn HC-616-1 SMALL VOLUME SAMPLE switch to position 3 (FLUSH LOOP).

17. With control panel power on, set Switch HC-700 to the "LIQUID" position and Liquid Sample Selector Switch HC-626 to position 2 (Jet Pump Line) if a jet pump sample is desired or to position 4 (RPV or Suppression Pool) if the Reactor valves were set for a RHR sample. Adust PCV-627 so that the flow thru FCV-627 does not exceed 0.3 gpm (See FI-664).

    Also, if a RHR sample is desired, close the normal RHR sample lines by placing the respective switch in the following position:

SAMPLE LOCATION	SWITCH NAME	POSITION
"A" RHR	RHR HX OUTLET NORMAL SAMPL ISLN LOOP A HV51-199A	CLOSE
"B" RHR	RHR HX OUTLET NORMAL SAMPL ISLN LOOP B HV51-199B	CLOSE

18. Raise the sample bottle into position on the needles by moving the lift rod on the side of the cask.

APPENDIX EP-231-4
PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE (CONT)

19. Screw the lift rod in to hold the sample bottle in the engaged position. Note: If the vial does not clear the entry hole, lower the vial and rotate the small volume cask about 1/8" in either direction. If it still does not fit either the liquid vial positioner fixture or liquid tray positioner needs adjustment. Note: The green light for the small volume sample should be on. If the light remains red, unscrew the lift rod, lower the bottle and reposition.

20. Turn HC-616-1 to the OFF position.

21. Turn Liquid Sample Selector Switch HC-626 to position 1 (Jet Pump Line on Bypass) for a sample from the jet pump line or to position 5 (RPV or Sup'n Pool on Bypass) for a sample from the RHR line. Adjust PCV-627 so that the flow thru FCV-627 does not exceed 1 gpm. (See FI-664) Continue this flow thru bypass valve CV-626 for a long enough period to be assured that the sample lines are flushed. The minimum time required to do this is 10 minutes. Record the flow and flush time on the data sheet.

22. After flush is completed, turn Switch HC-626 to position 2 (for jet pump sample) or position 4 (for RHR sample). Note that the flow on Indicator FI-664 is greatly reduced. Adjust Valve FCV-627 for a flow of 0.3 gpm, using PCV-627 (see FI-664).

23. Record the following on the data sheet:

    Flow (FI-664)

    Pressure (PI-661)

    Temperature (TI-660)

    Conductivity (CI-663)

    Radiation (RI-665)

24. Turn Small Volume Liquid Selector HC-616-1 to "TAKE SAMPLE" position (position 1). Valve CV-616 will rotate and carry the sample into alignment with the line to the sample bottle. Wait for Valve CV-616 light to come on.

25. Open both stopcocks on the syringe and inject 10cc of water into the line. Close the syringe stopcocks. Remove the syringe with one stopcock and fill it with air. Reattach the syringe and stopcock, open both stopcocks and inject the air, then close the stopcocks and remove the syringe with one stopcock.

APPENDIX EP-231-4
PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE (CONT)

26. Unscrew the lift rod and lower the sample bottle.

27. Slide the lead shield drawer back into the enclosure to cover the opening for the needles.

28. Turn the Switch HC-616-1 (small volume sample sw) to the FLUSH LOOP position (3). Make sure there is enough flow by adjusting PCV-627 so that it is set to at least 15 psig (see FI-664). Flush for 5 minutes and/or until RI-665 reaches a minimum.

29. When the flush is complete, turn HC-626 (Liquid Sample Source Selector Switch) "OFF" FIRST and then HC-616-1 to "OFF" (position 2).

30. Verify Switch HV51-199A(299A) or HV51-199B(299B) is in the OPEN position.

31. Unlock the arms of the cask holder and swing the cask out and immediately survey the vial and replace the lead stopper.

32. Transport the sample to the Hot Lab by removing both the positioner and cask and transporting together or if only the cask is desired, unscrew the lift rod out and transport only the cask.

33. Turn Flush Sytem HC-628-1 counterclockwise to position 6 and HC-626 to position 1 and observe that approximately 0.3 gpm flow per FI-664 is occuring. Leave in this position for 5 minutes then turn to OFF.

34. Drain Collector Tank, Trap and Sump by turning switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

35. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

36. Close FCV-627 to 0 psig by turning counterclockwise.

APPENDIX EP-231-4
PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE (CONT)

37. Close the nitrogen supply valves opened in Step No. 1: (Sign-off required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

38. Close the Demin Water Tank valves opened in Step No. 2: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

39. Close the damper.

40. Turn all switches (except for HC-723 which is left in position 4) to their "OFF" position.

APPENDIX EP-231-4
PROCEDURE FOR OBTAINING A SMALL VOLUME LIQUID SAMPLE (CONT)

Data Sheet for Small Volume Liquid Sample

DESIRED ANALYSIS

A._____

B._____

C._____

D._____

E._____

1. Sample Source _____ Date _____ Time _____
2. Bypass Flow _____ FI-664 (gpm)
3. Flush Time _____ Minutes
4. Sample Flow _____ FI-664 (gpm)
5. Pressure _____ PI-661 (psig)
6. Temperature _____ TI-660 (F)
7. Conductivity (CI-663)
   (_____ reading) (x 10) (_____ scale) = _____ micromhos/cm
8. Radiation _____ RI-665 (mR/hr)
9. Initial Contact Dose Rate _____(mR)

Name_____

APPENDIX EP-231-5

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

IF A SAMPLE IS TO BE OBTAINED FROM THE JET PUMP (JET PUMP 4 SENSING LINE), THERE EXISTS THE POSSIBILITY OF EXCESS FLOW CHECK VALVE XV-42-1F059H TRIPPING WHICH WILL REQUIRE MANUAL RESETTING BY OPERATIONS. THE ALARMS ARE LOCATED ON LOCAL PANEL 10C228 AND MAIN CONTROL BOARD ANNUNCIATOR 1BC802-35 (EXCESS FLOW CHECK VALVE OPERATED PANEL C228). IF AT ANY TIME WHILE SAMPLING AN INDICATION OF DECREASING FLOW (FCV627 on FI-664) AND/OR DECREASING PRESSURE (PI661) IS NOTICED, CONTACT THE CONTROL ROOM AND REQUEST MONITORING OF THESE ANNUNCIATORS.

1. Ensure that the nitrogen supply valves are open and that the pressure is set at 100 psig by opening the following valves:

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

2. Ensure that the Demineralized Flush Water Tank OOT 945 is full and is pressurized at 100 psig and the following valves are open to the sample station: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

If Demin Tank not filled, first close all valves opened in steps 1 and 2, then open valves 30-0011 and 30-0015, verify that valve 30-0014 is open, remove the plug on the Hydro Test Tap by valve 30-0015, and SLOWLY open valve 30-0010. Continue flow until water appears at the test tap. Close valve 30-0010 FIRST, then close valves 30-0011 and 30-0015. Replace the Test Tap plug and secure. Return to Step No. 1.

3. Verify that the damper is open (half-way) to Secondary Containment.

APPENDIX EP-231-5

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

4. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

5. Turn all control panel switches "OFF" (except HC-723, place in position 4 "SPARE") and then TURN the Control Panel Power Selector Switch HC-600 to "A" (Alternate "B").

6. Turn the Liquid or Gas Selector Switch to Liquid.

7. Turn Flush System Switch HC-628-1 counterclockwise to position 6 and HC-626 to position 1 (Jet Pump) or position 5 (RHR) and observe that approximately 0.3 gpm flow per FI-664 is occuring and providing a positive indication that the discharge line to the Suppression Pool is open.

8. After being assured that the discharge line to the suppression pool is open, drain Collector Tank, Trap and Sump by turning Switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

9. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

10. Have a syringe carrying device ready to use.

11. Place a radiation monitor to measure the radioactivity of the syringe.

12. If you desire to obtain a large volume liquid sample, proceed to step 13, otherwise skip to step 20.

    USE APPROPRIATE ANTI-C CLOTHING AND GOGGLES IF DIRECTLY INSPECTING THE SAMPLE NEEDLES BELOW THE SAMPLE STATION.

13. Make certain the lead shield drawer is out so that the needles under the sample station enclosure are exposed. Quickly inspect the needles with a mirror and flashlight. Check that the longest part of the needle is toward the center of the sample vial.

14. Remove lead stopper from large volume cask and put a 15 ML sample bottle with an outer aluminum retainer ring and a neoprene cap into the large cask. Note sample bottle must fit snugly in the holder and be vertically aligned. If necessary, place small pad under sample vial and/or attach the vial to the holder with Velco Tape. With cask in fully lowered position, roll cask into position under the sample station.

APPENDIX EP-231-5

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

15. Using the hydraulic pump slowly raise the cask, checking for proper alignment. Stop pumping when top cask ring is inside and the large volume cask is just below the bottom of the sample station.

16. Turn HC-616-1 SMALL VOLUME SAMPLE switch to position 3 (FLUSH LOOP).

17. With control panel power on, set Switch HC-700 to the liquid position, and Liquid Sample Selector Switch HC-626 to position 2 if a jet pump sample is desired or to position 4 if the Reactor valves were set for a RHR sample. Adjust PCV-627 so that the flow thru FCV-627 does not exceed 1 gpm (see FI-664).

18. Push the plunger down which causes the sample bottle to be raised out of the cask and up onto the two needles. Note that the "bottle in" light will change from red to green. If the cask is not aligned properly, lower bottle and reposition cask.

19. Turn HC-616-1 (Small Volume Sample Switch) to the "OFF" position.

20. Check that the Control Panel Power is ON. Turn HC-700 to LIQUID if it is not already there.

21. Turn the Liquid Sample Source Selector Switch HC-626 to position 1 for Jet Pump bypass line sample or position 5 for RHR sample.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

22. If RHR sample is desired, close the sample line valves to the normal sample station:

SAMPLE LOCATION	SWITCH NAME	POSITION
"A" RHR	RHR HX OUTLET NORMAL SAMPL ISLN LOOP A HV51-199A	CLOSE
"B" RHR	RHR HX OUTLET NORMAL SAMPL ISLN LOOP B HV51-199B	CLOSE

23. Adjust PCV-627 so that the flow on FI-664 is less than 1 gpm. Continue this flow for 10 minutes. Record the flow from FI-664 and flush time on the Data Sheet.

24. When flush is completed, turn HC-626 Sample Source Selector Switch to position 2 for a jet pump sample or position 4 if Reactor valves were positioned for a RHR sample. Adjust FCV-627 for a flow between 0.05 - 0.15 gpm (see FI-664).

25. Leave in these positions for at least 20 minutes. In the interim, proceed to step 26. Do not proceed to step 28 until this 20 minutes flushing time is completed.

26. Verify Leak Tight Dissolved Gas Chamber:

    a. Replace the septum in the gas collection chamber if it has been previously used for more than 15 times.

       NOTE: When replacing the septum, be sure the washers are in place.

    b. Turn the Dissolved Gas and Liquid Sample Switch HC-601 to position 1 (START P-701 AND INSERT NEEDLE). Do not insert needle into the gas collection chamber. Observed that P-701 starts and valve CV-622 rotates.

    c. When PI-662 is stable, turn Switch HC-601 to "OFF" or "RELIEVE PRESSURE/TAKE GAS SAMPLE."

    d. Confirm PI-662 does not rise more than 0.05 psia/min for at least three minutes.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

NOTE: i) If PI-662 increases more than 0.05 psia/min., this may indicate high air leak rate into the gas collection chamber. Tighten the septum first and repeat above steps.

ii) If tightening the septum still yields high pressure increases, replace the septum and repeat above steps. If replacing the septum still yields high pressure increases, this indicates a leak in valve or fitting. Accuracy of monitoring dissolved gases may be degraded unless repairs are made at this time.

e. Confirm PI-662 indicates 5.7 psia or lower.

NOTE: If Dissolved Gas Collection Chamber can not be evaucated to below 5.7 psia, this usually indicates the vacuum pump P-701 requires rebuild or replacement.

f. Turn the Dissolved Gas and Liquid Sample Switch HC-601 to position 1 (START P-701 AND INSERT NEEDLE).

27. Insert an open end needle through the septum via needle guide into the gas collection chamber. This allows air to purge into the gas collection areas.

28. Turn Switch HC-601 to position 2. Observe that P-601 starts. Leave in this position for 20 minutes and record the following on the data sheet:

Flow (FI-664)

Pressure (PI-661)

Conducitivity (CI-663)

Radiation (RI-665)

29. Isolate sample by turning HC-601 to position 3 (CIRCULATE AND SEPARATE GAS). Leave in that position for approximately 30 seconds.

30. Turn HC-601 to position 4 (REMOVE NEEDLE). Remove needle and wait until PI-662 is stable and is less than 5.7 psia.

31. Turn HC-601 to position 5 (CIRCULATE AND SEPARATE GAS). Leave in this position for 3 to 6 seconds.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

32. When PI-662 is stable, record value as P1 on the Data Sheet.

33. Begin collection of dissolved gas by turning switch HC-601 to position 6 (COLLECT DISSOVLED GAS), for 5 seconds and record pressure of PI-662 on the Data Sheet.

34. Turn switch HC-601 to position 7 (CIRCULATE AGAIN) for 10 seconds.

35. Turn switch HC-601 to position 8 (COLLECT DISSOLVED GAS AGAIN) for about 5 seconds. Record the pressure of PI-662 on the Data Sheet.

36. Repeat steps 34 and 35 concurrently until successive readings of PI-662 differ by less than 0.15 psia (normally, this will be done at least 4 times).

37. Turn switch HC-601 to position 9 (RELIEVE PRESSURE/TAKE GAS SAMPLE).

38. Record final pressure of PI-662 as PF on the Data Sheet.

39. Record water temperature from TI-660 on the Data Sheet.

40. After final dissolved gas pressure measurement is made, a calculation must be done to determine if a grab sample must be taken. For this calculation, the following dissolved gas information is required, P0, PF, temperature of Liquid Loop and Vapor Pressure of Water at the temperature of the liquid loop, PV.

41. Determine the valve of CT in the following equation.

    CT = 4.98 (PF - 1.05 PO - PV) (CT is in Scc/KG).

    PV is calculated from Table 1 in the Data Sheet for temperature indicated by TI-660, degrees F. Log CT on Item (12) of Data Sheet.
    Log PV on Item 7).

42. If CT is greater than 40 SCC/Kg, dissolved oxygen may be reported as less than 0.1 PPM and proceed to 45. If CT is less than 40 SCC/KG, a grab sample must be taken and analyzed on the gas chromatograph for oxygen and hydrogen.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

43. Dissolved gas sample can be taken by inserting the long needle of a gas tight syringe through the septum via the needle guide into the gas collection chamber. Allow pressure indicated on PI-662 to stablize. During this time, the syringe may be supported by a mechanical support. Withdraw a 5cc gas sample and lock syringe. DO NOT WITHDRAW NEEDLE.

    If PI-662 indicates greater than 14.7 psia, turn HC-652 to the left to relieve pressure in the gas collection chamber.

    WARNING: HAND CONTACT WITH SYRINGE WITH GAS SAMPLE IN IT SHOULD NOT EXCEED 30 SECONDS DUE TO POSSIBLE HIGH DOSE RATE.

    CAUTION: IF RADIATION MONITOR ALARMS AT 1500 REM/HR, INJECT SAMPLE BACK INTO THE GAS COLLECTION CHAMBER. TURN SWITCH HC-652 TO LEFT TO RELIEVE PRESSURE AND THEN REMOVE NEEDLE. DISCARD NEEDLE AND SYRINGE AS HIGH LEVEL RADIATION WASTE. HIGH DOSE RATE WILL BE DUE TO WATER ACCUMULATED IN SYRINGE. REPEAT ENTIRE DISSOLVED GAS PROCEDURE.

44. Remove needle and syringe and place in a shielded carrying device for transport to the laboratory.

45. If PI-662 indicates greater than 14.7 psia, turn HC-652 to the left to relieve pressure in the gas collection chamber.

46. If a large volume liquid sample is required, turn HC-601 to position 10. Push and hold in CH-629-1 so liquid will be drawn into sample bottle that was positioned earlier under the sample station. Hold pushbutton for at least 10 seconds.

    CAUTION: IF A LIQUID SAMPLE IS NOT REQUIRED, TURN SWITCH HC-601 TO THE OFF POSITION VERY QUICKLY SO THAT THE VALVES CV-620 WILL NOT HAVE A CHANGE TO ROTATE AND ALLOW HOT SOLUTION INTO THE LINE AHEAD OF CV-629.

47. Turn HC-601 to OFF.

48. Lower liquid sample bottle into large cask by pulling up on the plunger handle. NOTE: Do not turn or twist bottle while it is on the needles because the needles will bend.

49. Slide the lead shield drawer back into the enclosure to cover opening for the needles.

50. Lower the cask on the cart by relieving hydraulic oil pressure with the small petcock handle on the hydraulic cylinder.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

51. Roll the cask out from under the sample station and immediately survey the liquid vial and record the Initial Contact Dose Rate on the Data Sheet. Quickly plug cask. Use RI-665 to determine Gross Activity of the sample.

52. Switch HC-626 (Liquid Sample Source Selector Switch) must be in position 2 (jet pump) or 4 (RHR) and HC-700 (Liquid or Gas Selector Switch) must be in the LIQUID position.

53. Adjust PCV-627 on the control panel to have a 15 psi reading on the gauge.

54. Turn the FLUSH SYSTEM SWITCH (HC-628-1) to position 2 (Start Flush) which will close the inlet sample lines and start the flush with demineralized water from 00T 945. Observe that there is a flow per FI-664.

55. After RI-665 shows radiation has decreased significantly, or after 5 minutes, turn Switch HC-628-1 to position 3 (Flush V-610 Loop) to flush the V-610 loop. Watch RI-665.

56. After a few minutes, turn Switch HC-628-1 to position 4 (Flush P-601 Loop) and flush the P-601 loop. Watch RI-665.

57. After a few minutes, turn Switch HC-628-1 to position 5 (Flush CV-615) and flush Valve CV-615. Watch RI-665.

58. After a few minutes, turn Switch HC-628-1 to position 6 (Flush Piping Station) and flush the piping station for 3 minutes.

59. Turn Switch HC-628-1 to position 7 (Flush CV-622 Loop) for a few minutes to flush loop CV-622. Watch RI-665.

60. If RI-665 did not indicate an acceptable radiation level at any step of the operation, go back and repeat Steps 53 thru 60.

61. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

62. Turn Flush Sytem HC-628-1 counterclockwise to position 6 and HC-626 to position 1 and observe that approximately 0.3 gpm flow per FI-664 is occuring. Leave in this position for 5 minutes.

63. Drain Collector Tank, Trap and Sump by turning switch HC-715-1 clockwise through its eight positions pausing approximately 5 seconds at each position.

64. Turn HC-626 to "OFF" FIRST and then HC-628-1 to "OFF".

65. Close FCV-627 to 0 psig by turning counterclockwise.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

66. Close the nitrogen supply valves opened in Step No. 1: (Sign-off required)

N2 Bottle 1			N2 Bottle 2	
Bottle Valve	_____	*OR*	Bottle Valve	_____
PCV-30-074	_____		PCV-30-073	_____
Isolation Valve	_____		Isolation Valve	_____
30-0022	_____		30-0023	_____

Unit 1			Unit 2	
30-1114	_____	*OR*	30-2114	_____

Demin Water Tank

30-0017 _____

67. Close the Demin Water Tank valves opened in Step No. 2: (Sign-off required)

30-0014 _____

Unit 1			Unit 2	
30-1100	_____	*OR*	30-2100	_____

68. Close the damper.

69. Turn all switches (except for HC-723 which is left in position 4) to their "OFF" position.

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

DATA SHEET

DESIRED ANALYSIS

A. _____

B. _____

C. _____

D. _____

E. _____

1. Sample Source _____ Date _____ Time _____
2. Bypass Flow _____ FI-664 gpm
3. Flush Time _____ Minutes
4. Sample Flow _____ FI-664 gpm
5. Pressure _____ PI-661 psig
6. Conductivity Meter _____ Scale _____ CI-663
7. Radiation _____ RI-665
8. Initial Pressure PO _____ PI-662 PSIA
9.

CYCLE 1 P1 - PI662 PSIA	CYCLE 2 P1 - PI662 PSIA	CYCLE 3 P1 - PI662 PSIA	CYCLE 4 P1 - PI662 PSIA	CYCLE 5 P1 - PI662 PSIA	CYCLE 6 P1 - PI662 PSIA

10. Final P1 = PF = _____ PSIA
11. Temperature _____ TI-660
12. CT (Initial) _____ Scc/kg (from step 41)
13. If sample taken, fraction of sample H2 = _____ (from gas chromatograph) = NH
14. If sample taken, fraction of sample 02 = _____ (from gas chromatograph = NO

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

15. Liquid Sample Contact Dose _____ mR

16. Gas Sample Contact Dose _____ mR

17. Vapor Pressure of Water = _____ PSIA = PV

18. SH = Solubility of H2 at T (Step 11) _____ (Scc/kg - atm)
(from Table 2)

19. SO = Solubility of 02 at T (Step 11) _____ (Scc/kg - atm)
(From Table 3)

20. CT (Final) = Total Dissolved Gas Concentration

$$= (0.068)(NH)(SH) + (3.85)(PF-PV-1.05\ P0) + ((NO)(PF-PV-1.05P0) + (0.29\ P0))(SO)$$

= _____ Scc/kg

21. CO2 = Concentration of 02 = $\frac{((NO)(PF) - (0.29)(PO))\ CT}{(PF-1.05PO-PV)}$

22. C02 = _____ Scc/Kg

23. CH2 = Concentration of H2 = $\frac{(NH) \times (PF) \times (CT)}{(PF-1.05PO-PV)}$

24. CH2 = _____ Scc/Kg

Name _____

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

TABLE 1

WATER VAPOR PRESSURE

The following water vapor pressure data is a function of liquid sample temperature and is used in the calculational method.

TL(Degrees F)	PV(psia)	TL(Degrees F)	PV(psia)
60	.2561	102	1.008
62	.2749	104	1.070
64	.2950	106	1.135
66	.3163	108	1.203
68	.3389	110	1.275
70	.3629	112	1.351
72	.3884	114	1.430
74	.4155	116	1.513
76	.4442	118	1.601
78	.4746	120	1.693
80	.5068	122	1.789
82	.5409	124	1.890
84	.5770	126	1.996
86	.6152	128	2.107
88	.6555	130	2.223
90	.6981	132	2.345
92	.7432	134	2.472
94	.7906	136	2.605
96	.8407	138	2.744
98	.8936	140	2.889
100	.9492	142	3.041
		144	3.200
		146	3.365
		148	3.538
		150	3.718

Source: ASME Steam Tables, 1967

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

TABLE 2

SOLUBILITY OF HYDROGEN IN WATER

The following solubility data is a function of liquid sample temperature which is used in the calculational method.

TL(Degrees F)	SH(Scc/Kg-atm)	TL(Degrees F)	SH(Scc/Kg-atm)
60	18.56	102	16.67
62	18.34	104	16.56
64	18.22	106	16.56
66	18.11	108	16.56
68	18.00	110	16.56
70	17.89	112	16.45
72	17.67	114	16.45
74	17.56	116	16.45
76	17.56	118	16.45
78	17.45	120	16.45
80	17.34	122	16.45
82	17.22	124	16.45
84	17.11	126	16.45
86	17.11	128	16.45
88	17.00	130	16.45
90	16.89	132	16.45
92	16.89	134	16.45
94	16.78	136	16.56
96	16.78	138	16.56
98	16.67	140	16.56
100	16.67	142	16.56
		144	16.56
		146	16.67
		148	16.67
		150	16.67

APPENDIX EP-231-5 (CONT'D)

PROCEDURE FOR MONITORING TOTAL DISSOLVED GAS (AND, IF DESIRED, OBTAINING A DISSOLVED GAS SAMPLE) AND/OR OBTAINING A LARGE VOLUME LIQUID SAMPLE

TABLE 3

SOLUBILITY OF OXYGEN IN WATER

The following solubility data is a function of liquid sample temperature which is used in the calculational method.

TL(Degrees F)	SH(Scc/Kg-atm)	TL(Degrees F)	SH(Scc/Kg-atm)
60	37.04	102	25.80
62	36.27	104	25.49
64	35.50	106	25.18
66	34.80	108	24.87
68	34.11	110	24.56
70	33.42	112	24.26
72	32.80	114	24.02
74	32.19	116	23.79
76	31.57	118	23.49
78	31.03	120	23.25
80	30.49	122	23.02
82	29.95	124	22.79
84	29.45	126	22.64
86	28.95	128	22.41
88	28.49	130	22.25
90	28.11	132	22.02
92	27.64	134	21.87
94	27.26	136	21.71
96	26.87	138	21.56
98	26.49	140	21.41
100	26.18	142	21.25
		144	21.10
		146	20.94
		148	20.84
		150	20.71

APPENDIX EP-231-6

APPENDIX EP-231-8
DIAGRAM OF CONTROL PANEL - RIGHT SIDE

APPENDIX EP-231-9
CONTROL PANEL SWITCH LAYOUT

APPENDIX EP-231-10
SCHEMATIC OF POST ACCIDENT SAMPLE STATION

PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION
EMERGENCY PLAN IMPLEMENTING PROCEDURE

EP-237 OBTAINING THE IODINE/PARTICULATE AND/OR GAS SAMPLES FROM THE NORTH VENT WIDE RANGE GAS MONITOR (WRGM)

1.0 PARTICIPANTS

1.1 Chemistry Sampling and Analysis Team Leader shall obtain necessary information and permissions to obtain sample.

1.2 Chemistry Sampling and Analysis Group Leader shall organize and brief the sampling group and have operations defeat isolations.

1.3 HP Technician shall provide radiological assessment of the task.

1.4 Chemistry Sampling and Analysis Group shall obtain the sample.

2.0 ACTIONS-IMMEDIATE

2.1 Chemistry Sampling and Analysis Team Leader shall:

2.1.1 After discussing the situation with the Emergency Director, determine if a filter/cartridge or gas sample is required from the North Vent WRGM.

2.1.2 Check the Plant Radiation Level Status Board to forecast anticipated radiological conditions.

2.1.3 Contact the Personnel Safety Team Leader and check on the latest developments related to radiological conditions and inform him what sample(s) are to be taken and that Health Physics coverage is required.

CONTINUOUS COVERAGE BY A HEALTH PHYSICS TECHNICIAN MAY SUBSTITUTE FOR THE RADIATION WORK PERMIT.

2.1.4 Request input from the Control Room (via Emergency Director) to ascertain desired sample system availability.

2.1.5 Determine what analyses are required and inform the Chemistry Sampling and Analysis Group Leader. If an Iodine/Particulate sample is to be taken, recommend sampling time.

2.1.6 Request Emergency Exposure Authorizations from the Emergency Director for Group Members (as required) and inform the Personnel Safety Team Leader of this development.

2.1.7 If the South Stack route is desired, contact the Security Team Leader and arrange access for this route.

2.1.8 Direct the Chemistry Sampling and Analysis Group Leader to collect and analyze the appropriate samples.

2.2 Chemistry Sampling and Analysis Group Leader shall:

2.2.1 Determine what type(s) of sample(s) are to be taken:

2.2.1.1 Local Particulate/Iodine Sample

2.2.1.2 Remote Particulate/Iodine Sample

2.2.1.3 Gas Grab Sample

2.2.2 Assign the appropriate number of group members to obtain the necessary equipment to collect and transport the sample to the Chemistry Hot Lab.

2.2.3 Brief the Chemistry Sampling and Analysis Group members on the following:

2.2.3.1 Communications equipment and channel

2.2.3.2 Type and sampling time of sample(s) to be collected

2.2.3.3 Location of sample point

2.2.3.4 Suggested routes to be taken

2.2.3.5 Sample transport technique

2.2.3.6 Projected amount of time required to collect and transport the sample

2.2.3.7 Review of the procedures to be followed for sample collection, handling, preparation and analysis

2.2.3.8 Special tools and equipment required for sample handling and/or collection

2.2.3.9 Proper completion of Data Sheets.

2.2.4 Appoint Group member(s) to prepare the Hot Lab for receiving the sample.

USE THE FOLLOWING PROCEDURES AS GUIDELINES FOR PREPARATION OF THE HOT LAB.

EP-241 (LIQUID) Sample Preparation and Handling of Highly Radioactive Liquid Samples.

EP-242 (IODINE) Sample Preparation and Handling of Highly Radioactive Particulate Filters and Iodine Cartridges.

EP-243 (GAS) Sample Preparation and Handling of Highly Radioactive Gas Samples.

2.2.5 Dispatch the Chemistry Sampling and Analysis Group members to the OSC for Health Physics Support if radiological conditions permit or other appointed location as determined by the Plant Survey Group Leader.

2.3 The Health Physics Technician shall:

2.3.1 Determine which route should be used to collect and transport the sample.

CAUTION
DO NOT USE ELEVATORS

2.3.2 Take appropriate radiation survey equipment and ensure that equipment is functional and calibrated.

2.3.3 Provide Group Members with the appropriate Dosimetry, Protective Clothing and Respiratory Equipment.

EYE PROTECTION SHOULD BE WORN WHEN OBTAINING SAMPLES FROM THE SAMPLE STATIONS.

2.3.4 Perform a pre-job briefing with the Chemistry technicians assigned to obtain the sample, to discuss the following:

2.3.4.1 RWP requirements

2.3.4.2 Routes to be used

2.3.4.3 Authorized doses

2.3.4.4 Radiological concerns and precautions

2.3.4.5 Review of procedure for obtaining and transporting sample to hot lab

2.3.4.6 Suggested methods to maintain exposures ALARA

2.3.4.7 Stay times and Abort Criteria

2.3.5 Provide constant coverage while obtaining, transporting and analyzing the sample filter/cartridge and/or gas sample from the WRGM.

2.3.6 Monitor dose rates enroute to and at the sample location.

2.3.6.1 Upon entering the power block, the surveyor shall note trends in general radiation levels enroute to the sample point. If general area dose rates (unanticipated) exceed 10 R/hr gamma or 10 Rad/hr beta, prior to arriving at the point specified below, immediately report to Chemistry Sampling and Analysis Group Leader, who will evaluate the situation with the Personnel Safety Team Leader.

2.3.6.2 If the dose rate (unanticipated) exceeds 5 R/hr at the door leading to 217', 332', 352', or 411' El. exit the area immediately and report to Chemistry Sampling and Analysis Group Leader with this information. With dose rates less than 5 R/hr., enter the desired elevation through that door. Take careful note of the dose rates.

2.3.6.3 If using the route suggested in procedure step 2.2.3, remember the stairs are next to the North Vent. If general area dose rate (unanticipated) exceeds 10 R/hr. gamma or 10 Rad/hr beta, exit the area immediately and report to Chemistry Sampling and Analysis Group Leader, who will evaluate the situation with the Personnel Safety Team Leader.

2.3.7 Survey the sample area and sample cask.

2.3.8 Document the sample cask survey results and give them to the Chemistry Sampling and Analysis Group Leader (or other designated group member) when arriving at the Hot Lab.

2.3.9 Provide constant coverage during sample preparation and handling as specified in EP-242 or 243.

2.4 Chemistry Sampling and Analysis Group members shall:

2.4.1 Assemble for a pre-job briefing at the chemistry lab.

2.4.2 Inform the Group Leader if they are approaching the administrative exposure guidelines or do not have sufficient exposure remaining to successfully complete the assigned task.

2.4.3 Obtain the necessary equipment to collect the sample and ensure that the Hot Lab is ready to accept the sample:

2.4.3.1 Properly label all sample containers.

2.4.3.2 If a gas sample is to be taken, prepare three evacuated gas sampling vials by withdrawing from the sample vial (with a syringe) the same volume that is to be injected as a sample.

2.4.4 Once the group has been briefed and the appropriate equipment has been assembled, proceed to the OSC or other designated location for Health Physics coverage. Once briefed by Health Physics perform the appropriate section for the desired sample:

A. Remote Particulate/Iodine Sample

B. Local Particulate/Iodine Sample

C. Gas Grab Sample

A. REMOTE PARTICULATE/IODINE SAMPLE

1. Proceed to the Control Room.

2. Locate Control Room Panel Timer/Control Assembly (RIX-26-076, KIC-26-076-1, KIC-26-076-2).

3. Verify SKID CONT-REMOTE light is lit.

   IF SKID CONT-REMOTE LIGHT IS NOT LIT AND SKID CONT-LOCAL LIGHT IS LIT, THEN THE SAMPLE CONDITION SKID CONTROL STATION ELECTRICAL ENCLOSURE LID IS OPEN AND THE SKID CONTROL SWITCH (HSS-076-2) IS IN THE LOCAL POSITION.

   Tell group leader remote sample is impossible and ask for further instructions.

4. Press CLEAR.

5. Press MON, 1, 3, 6, ITEM and the channel number will be displayed. Record channel number.

CHANNEL NUMBER	RANGE BUTTON
1	LOW RANGE
2	MID RANGE
3	HIGH RANGE

6. Push appropriate channel (Range) button. Record concentration.

7. Press MON, 1, 3, 7, ITEM.

   If the value is equal to 2, inform the Team Leader of the Range and Concentration and inform that isokinetic sampling is present. Have the Team Leader verify the estimated Sampling Time and Range Selection is feasible. Record Range Selection and Sampling Time. Proceed to Section A-1 (or Section B-1 if a Local Sample is desired).

   If the value is NOT equal to 2, proceed to step 8.

8. PRESS MON, 1, 3, 8, ITEM.

   If the value is equal to 2, inform the Team Leader of the Range and concentration and inform that isokinetic sampling is present. Have the Team Leader verify the estimated Sampling Time and Range Selection is feasible. Record Range Selection and sampling time. Proceed to Section A-2 (or Section B-2 if a Local Sample is desired).

   If the value is NOT equal to 2, proceed to step 9.

9. Inform the Team Leader that isokinetic sampling is impossible and ask for further instructions.

A-1 LOW RANGE (REMOTE SAMPLE)

10. Record letter (A or B) of prefilter in service (HSS-26-076-10).

11. Set KIC-26-076-2, LOW RANGE GRAB SAMPLE TIMER, to the desired sample time by use of the screwdriver adjustment and record the SAMPLING TIME.

12. Press START TIMER pushbutton (HS-26-076-2) and verify the timer display is counting. Record the time as TIME-1.

13. When the timer stops counting, grab sample has been taken. Record time as TIME-2.

14. Press MON, 0, 2, 8, ITEM and the flow will be displayed. Record the flow.

15. Press MON, 0, 2, 9, and the stack flow will be displayed. Record the stack flow.

16. Press CLEAR.

17. Turn HSS-26-076-10 to the desired prefilter and record the letter (A or B) or prefilter in service.

18. Proceed to the North Vent WRGM.

    GROUP MEMBERS AT THE WRGM PERFORM:

19. Close the isolation valves (26-0026, 26-0027, 26-0028, 26-0029) on each side of the quick-disconnects on GRAB SAMPLE 1.

20. Release the band on the holder assembly and immediately have the HP Technician survey the sample and record the Initial Contact Dose Rate. Remove the cartridge and filter paper and place into an appropriate transport cask.

21. Install a new cartridge and filter paper into the assembly and reclip the band.

22. Open the isolation valves (26-0026, 26-0027, 26-0028, 26-0029).

23. Transport the sample to the Chemistry Hot Lab.

A-2 MID/HIGH RANGE (REMOTE SAMPLE)

10. Record letter (C or D) of prefilter in service (HSS-26-076-9).

11. Set KIC-26-076-1, MID HIGH RANGE GRAB SAMPLE TIMER, to the desired sample time by use of the screwdriver adjustment and record the SAMPLING TIME.

12. Press START TIMER pushbutton (HS-26-076-1) and verify the timer display is counting. Record the time as TIME-1.

13. When the timer stops counting, grab sample has been taken. Record time as TIME-2.

14. Press MON, 0, 7, Z, ITEM and the flow will be displayed. Record the flow.

15. Press MON, 0, 2, 9, and the Stack Flow will be displayed. Record the stack flow.

16. Press CLEAR.

17. Turn HSS-26-076-9 to the desired prefilter and record the letter (C or D) or prefilter in service.

18. Proceed to the North Vent WRGM.

GROUP MEMBERS AT THE WRGM PERFORM:

19. Close the isolation valves (26-0021, 26-0022, 26-0023, 26-0024) on each side of the quick-disconnects on GRAB SAMPLE 2.

20. Open the door to the holder assembly and immediately have the HP Technician survey the holder assembly and record the Initial Contact Dose Rate.

21. Release the quick-disconnects on either side of the holder assembly and place the holder assembly into an appropriate transport cask.

22. Install a new holder assembly.

23. Open the isolation valves (26-0021, 26-0022, 26-0023, 26-0024).

24. Transport the sample to the Chemistry Hot Lab.

B. LOCAL PARTICULATE/IODINE SAMPLE

B-1 LOW RANGE (LOCAL SAMPLE)

10. Proceed to the North Vent WRGM.

11. Verify that the isolation valves (26-0026, 26-0027, 26-0028, 26-0029) on either side of the quick-disconnects for GRAB SAMPLE 1 are OPEN.

12. Verify that HSS-26-076-4, FILTER SELECTOR LOW RANGE switch is in position A or B.

13. Locate Sample Conditioning Skid Control Station Electrical Enclosure. Open lid and set HSS-26-076-2, SKID CONTROL switch to LOCAL.

14. Verify the green REMOTE CONTROL DISABLE lamp is lit.

15. Record position (A or B) of HSS-26-076-4, FILTER SELECTOR LOW RANGE switch.

16. Turn HSS-26-076-4 to GRAB 1 position and immediately record the time as TIME-1.

17. After the desired time has expired, turn HSS-26-076-4 to position A or B and immediately record the time as TIME-2 and record the position.

18. Close the isolation valves (26-0026, 26-0027, 26-0028, 26-0029).

19. Release the band on the holder assembly and immediately have the HP Technician survey the sample and record the Initial Contact Dose Rate.

20. Remove the cartridge and filter paper and place into an appropriate transport cask.

21. Install a new cartridge and filter paper into the assembly.

22. Reclip the band on the holder assembly.

23. Open the isolation valves (26-0026, 26-0027, 26-0028, 26-0029).

24. Set HSS-26-076-2, SKID CONTROL switch to REMOTE.

25. Close Sample Conditioning Skid Control Station Electrical Enclosure lid and secure.

26. Transport the sample to the Chemistry Hot Lab.

27. Contact the Control Room and obtain the Stack Flow and Sample Flow at the time the sample was taken and record.

B-2 <u>MID/HIGH RANGE (LOCAL SAMPLE)</u>

10. Proceed to the North Vent WRGM.

11. Verify that the isolation valves (26-0021, 26-0022, 26-0023, 26-0024) on either side of the quick-disconnects for GRAB SAMPLE 2 are OPEN.

12. Verify that HSS-26-076-3, FILTER SELECTOR HIGH RANGE switch is in position C or D.

13. Locate Sample Conditioning Skid Control Station Electrical Enclosure. Open lid and set HSS-26-076-2, SKID CONTROL switch to LOCAL.

14. Verify the green REMOTE CONTROL DISABLE lamp is lit.

15. Record position (C or D) of HSS-26-076-3, FILTER SELECTOR HIGH RANGE switch.

16. Turn HSS-26-076-3 to GRAB 2 position and immediately record the time as TIME-1.

17. After the desired time has expired, turn HSS-26-076-3 to position C or D and immediately record the time as TIME-2 and record the position.

18. Close the isolation valves (26-0021, 26-0022, 26-0023, 26-0024).

19. Open the door to the holder assembly and immediately have the HP Technician survey the holder assembly and record the Initial Contact Dose Rate.

20. Release the quick-disconnects on either side of the holder assembly and place the holder assembly into an appropriate transport cask or unlatch the holder assembly and place the cartridge and filter paper into an appropriate transport cask.

21. Install a new holder assembly complete with cartridge and filter paper or install only a new cartridge and filter paper as applicable.

22. Close the door to the holder assembly.

23. Open the isolation valves (26-0021, 26-0022, 26-0023, 26-0024).

24. Set HSS-26-076-2, SKID CONTROL switch to REMOTE.

25. Close Sample Conditioning Skid Control Station Electrical Enclosure lid and secure.

26. Transport the sample to the Chemistry Hot Lab.

27. Contact the Control Room and obtain the Stack Flow and Sample Flow at the time the sample was taken and record.

C. GAS GRAB SAMPLE

1. Proceed to the North Vent WRGM.

2. Verify that either PUMP ON LOW or PUMP ON MID/HIGH or both green lights are lit.

3. Verify that either MID/HIGH FLOW or LOW RANGE FLOW switches or both visual flow meters on sample detection skid are indicating flow.

4. Locate sample tap valve and verify that it is closed.

5. Remove plug and install septum valve and verify valve is closed.

6. Open sample tap valve.

7. Open septum valve.

8. Insert the 1.0 ml microsyringe through the septum valve and the septum valve into the tee connection.

9. Flush the microsyringe by taking a 1.0 ml sample and injecting it back into the sample tee two times.

10. Take a 1.0 ml sample and remove the microsyringe from the sample tee. Inject the sample into an evacuated 14.4 ml off gas vial.

11. Place the vial into an appropriate container for transportation to the Hot Lab.

12. Close the septum valve.

13. Close the sample tap valve.

14. Record the sample volume and time in Appendix EP-237-3.

15. Have the HP Technician survey the vial and record the Initial Contact Dose Rate.

16. Transport the sample to the hot lab by retracing the route back from the sample station.

2.4.5 Upon introduction of the sample into the hot lab, the sample will be handled and stored in a manner that personnel exposures are kept ALARA.

2.4.6 Contact the Group Leader as soon as the sample reaches the hot lab and inform him that the sample collection has been completed and what the sample status is.

3.0 ACTIONS - FOLLOW-UP

3.1 Chemistry Sampling and Analysis Group members shall:

3.1.1 Complete Appendix EP-237-1.

3.1.2 Prepare, handle and analyze the sample using EP-242 or EP-243.

3.1.3 Report the results to the Chemistry Sampling and Analysis Group Leader.

3.1.4 Properly file the Data Sheets and report back to the Group Leader for reassignment.

3.1.5 Return all sampling equipment to the CHEMISTRY EMERGENCY CABINET.

3.2 Chemistry Sampling and Analysis Group Leader shall:

3.2.1 Ensure Group member(s) dose is monitored to ensure that exposure limits have not been exceeded.

3.2.2 Inform the Chemistry Sampling and Analysis Team Leader that the required sample is in the hot lab.

3.2.3 Direct group members to refer to EP-242 Sample Preparation and Handling of Radioactive Particulate and Iodine Cartridges or EP-243 Sample Preparation & Handling of Highly Radioactive Gas Samples, for guidance for sample preparation and handling.

3.2.4 Obtain and review ALL Data Sheets and report the sample results to the Chemistry Sampling and Analysis Team Leader and attach all Data Sheets to Appendix EP-230-2.

3.3 Chemistry Sampling and Analysis Team Leader shall:

3.3.1 Report the results to the Emergency Director and the Health Physics and Chemistry Coordinator (EOF).

4.0 APPENDICES

4.1 EP-237-1 Data Sheet

5.0 SUPPORTING INFORMATION

5.1 Purpose - The purpose of this procedure is to provide guidelines for obtaining paritculate/iodine and/or gas samples from the North Vent WRGM following accident conditions.

5.2 Criteria for Use

5.2.1 Prior to entering the plant to obtain the sample, ensure that the iodine cartridges and particulate filter papers are adequate and properly installed by verifying that RT-5-026-620-0, routine changeout of iodine cartridges and particulate filters from the North Vent Wide Range Gas Monitor (WRGM) is properly completed.

5.2.2 This procedure shall be implemented when a particulate, iodine or gas sample shall be taken from the North Vent WRGM during an emergency situation.

5.2.3 Planned radiation exposures should be limited to the administrative guide levels in Appendix EP-230-1 Emergency Exposure Guidelines.

5.3 Special Equipment

5.3.1 3-off gas vials with septums

5.3.2 Adjustable wrench

5.3.3 Channel lock pliers

5.3.4 Extremity dosimetry

5.3.5 Extra filter

5.3.6 Extra cartridge

5.3.7 Mininert-septum valve

5.3.8 Transport cask

5.3.9 Designated remote handling tools

5.3.10 Plastic bags

5.3.11 Screwdriver

5.4 REFERENCES

5.4.1 EP-230 - Chemistry Sampling and Analysis Team Activation

5.4.2 M-102 - General Arrangement Plan at El. 217'-0"

5.4.3 M-106 - General Arrangement Plan at El. 352'-0"

5.4.4 General Arrangement Plan at El. 411'-0"

5.4.5 M-26 P&ID, Sh. 1, Rev. 8, Sh. 3, Rev. 3, Sh. 4, Rev. 3, - Plant Process Radiation Monitoring

5.4.6 EP-242 - Sample Preparation And Handling of Highly Radioactive Particulate Filters and Iodine Cartridges

5.4.7 EP-243 - Sample Preparation And Handling Of Highly Radioactive Gas Samples

APPENDIX EP-237-1
DATA SHEET

Sample: _____, _____

Analysis: _____, _____

Est. Sampling Time: _____

A. FOR OBTAINING REMOTE PARTICULATE/IODINE SAMPLE

Channel number: _____ (1,2 or 3)
Conc. _____
Range Selection _____ (Low or Mid/High)
Sampling Time _____

A-1 LOW RANGE	A-2 MID/HIGH RANGE
Prefilter _____ (A or B)	Prefilter _____ (C or D)
Sampling Time _____	Sampling Time _____
Time-1 _____	Time-1 _____
Time-2 _____	Time-2 _____
Flow _____	Flow _____
Stack Flow _____	Stack Flow _____
Prefilter _____ (A or B)	Prefilter _____ (C or D)
Initial Contact Dose Rate ____	Initial Contact Dose Rate ____

B. FOR OBTAINING LOCAL PARTICULATE/IODINE SAMPLE

B-1 LOW RANGE	B-2 MID/HIGH RANGE
Prefilter _____ (A or B)	Prefilter _____ (C or D)
Time-1 _____	Time-1 _____
Time-2 _____	Time-2 _____
Prefilter _____ (A or B)	Prefilter _____ (C or D)
Initial Contact Dose Rate ____	Initial Contact Dose Rate ____
Stack Flow _____	Stack Flow _____
Sample Flow _____	Sample Flow _____

C. FOR OBTAINING A GAS GRAB SAMPLE

Time _____
Vol. 1.0 ml

NAME: _____
_____
_____

3853010640

PHILADELPHIA ELECTRIC COMPANY
ELECTRIC PRODUCTION DEPARTMENT
LIMERICK GENERATING STATION

01/11/85

FROM: J. Wiley

TO: G. M. Leitch

SUBJECT: CANCELLATION MEMORANDUM FOR EP-240
Reference: Limerick Administrative
Procedure A-21

EP-240 should be cancelled because it is no longer necessary to obtain off-gas samples from the air ejector holdup pipe discharge sample station.

John Wiley
J. Wiley

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FROM: G. M. Leitch

TO: Holders of EP Procedures

This Cancellation Memorandum has been reviewed by PORC and is approved. All holders of EP procedures should discard EP-240. In accordance with Administrative Procedure A-21, procedure number EP-240 will not be re-used.

CONTROLLED COPY

APPROVED: STATION SUPERINTENDENT

DATE:

VALID ONLY WHEN RED

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-5020

M. J. COONEY
MANAGER
NUCLEAR PRODUCTION
ELECTRIC PRODUCTION DEPARTMENT

February 7, 1985

Re: Docket Nos. 50-352
50-353

Dr. Thomas E. Murley
Region 1
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Enclosed are two copies of Limerick Generating Station Emergency Plan Implementing Procedures EP-231, Rev. 6 and EP-237, Rev. 5. These procedures are submitted per regulations in 10 CFR 50, Appendix E, Section V.

Two copies have been sent under separate cover to the Document Control Desk.

Very truly yours,

Original signed by
M. J. COONEY

Enclosure

cc: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Site Inspector - LGS

See Attached Service List

A045
1/1

cc: Judge Helen F. Hoyt
Judge Jerry Harbour
Judge Richard F. Cole
Troy B. Conner, Jr., Esq.
Ann P. Hodgdon, Esq.
Mr. Frank R. Romano
Mr. Robert L. Anthony
Ms. Phyllis Zitzer
Charles W. Elliott, Esq.
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Mr. Thomas Gerusky
Director, Penna. Emergency Management Agency
Angus Love, Esq.
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Atomic Safety & Licensing Appeal Board
Atomic Safety & Licensing Board Panel
Docket & Service Section
James Wiggins
Timothy R. S. Campbell