FPL

May 6, 2016

L-2016-112
10 CFR 50 Appendix E

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Emergency Plan Implementing Procedure

In accordance with 10 CFR 50 Appendix E, is a copy of the revised procedure that implements the Emergency Plan listed below.

Number	Title	Revision	Implementation Date
CY-SL-108-0004	Guidelines For Collecting Post-Accident Samples	6	April 20, 2016

A revision summary is provided on page 2 of the enclosed procedure. Contact us if there are questions regarding this procedure.

Sincerely,

Michael J. Snyder
Licensing Manager
St. Lucie Plant

MJS/tlt

Enclosure

A x45
NRR

FPL

ST. LUCIE PLANT

CHEMISTRY OFF NORMAL-ACCIDENT PROCEDURE

SAFETY RELATED

MULTIPLE USE

Procedure No.

CY-SL-108-0004

Revision No.

6

Title:

GUIDELINES FOR COLLECTING POST-ACCIDENT SAMPLES

Responsible Department: CHEMISTRY

Special Considerations:

This is an Upgraded Procedure.

This procedure implements the Emergency Plan and is subject to the same processing requirements as an EPIP

Implementation Date

4, 20, 16

Initials

FOR INFORMATION ONLY
Before use, verify revision and change documentation (if applicable) with a controlled index or document.
DATE VERIFIED_____ INITIAL_____

Revision	Approved By	Approval Date
0	D. Calabrese	10/29/12
6	C. Spencer	03/22/16

UNIT #	
DATE	
DOCT	PROCEDURE
DOCN	CY-SL-108-0004
SYS	
STATUS	COMPLETED
REV	6
# OF PGS	

REVISION SUMMARY

Rev. No.	Description
6	Incorporated PCR 2104989 to create new Step 2.2.13 in Limitations section. (Author: R. Stottlemire)
5	Incorporated PCR02056693 addressing a new sample line cross connect valve installed in accordance with EC284190, 2A/2B Sample Heat Exchanger Downstream Cross Connection.
4	Incorporated PCR 1909178 to update procedure references. (Author: E. Young)
3	Incorporated PCR 1973055 per AR 1893137 to add Attachment 12, Emergency Preparedness Sampling Supply Checklist. (Author: A. Benton)
2	Incorporated PCR 1874983 to update procedure number reference. (Author: J. Ball) AND Incorporated PCR 1894809 to update procedure number reference. (Author: E. Young)
1	Incorporated PCR 1859648 to update procedure number reference. (Author: J. Ball)

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1.0 PURPOSE

1. To provide Chemistry Department guidelines for sample collection and operational concerns during plant emergencies.

2. To provide guidelines that identify potential areas of concerns and resulting actions for long term surveillance program following a plant incident.

3. To provide instructions for estimating RCS Dose Equivalent Iodine-131 (DEQ I-131) activity using normal Primary Sample System, in order to classify fuel damage events at Alert level. (Section 8.2, Commitment 1)

4. To provide guidelines for development of contingency plans for obtaining and analyzing highly radioactive samples of Reactor Coolant, Containment Sump and Containment Atmosphere. (Section 8.2, Commitment 1)

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Precautions

1. High Radiation Areas will be present when obtaining liquid or gaseous samples. Radiation survey instruments should be monitored frequently while purging and drawing samples.

2. It may be necessary to leave area while sample is purging, to reduce exposure.

2.2 Limitations

1. Samples shall **NOT** be obtained for outside agencies without concurrence of both Emergency Coordinator and Chemistry Supervisor.

2. Number of samples collected may vary based on OSC manpower support.

3. Radiation Protection briefs are required for all teams making reentry into plant from OSC. Dose extensions may be necessary prior to entry based on radiological conditions.

4. All samples shall be labeled with proper identification and results entered into Chemistry Data Management System (CDMS).

2.2 Limitations (continued)

5. If Containment Isolation Signal (CIS) has actuated, sample valves must be reset and CIS override provided in order to obtain sample flow from RCS or containment.

6. Containment radiation monitors sample line will be isolated following CIS. Sample pump on monitor should be stopped from Control Room.

7. Steam Generator Blowdown sample valves will close after CIS actuation. Sample valves may be reopened if necessary and samples collected inside RAB at blowdown sample panel to prevent spread of contamination to Cold Lab.

8. LPSI flow path should be verified with Control Room prior to sampling shutdown cooling.

9. If CIS has isolated radiation monitors, containment air samples may be collected from Post LOCA Hydrogen analyzers.

10. Actions to maintain Steam Generator Blowdown Building uncontaminated after S/G tube rupture include leaving blowdown isolated or by blowing down to discharge canal if release permit Effluent Concentration Limits (ECL) are **NOT** exceeded.

11. If RCS DEQ I-131 is greater than 300 μCi/ml as estimated using normal primary sample system, samples shall **NOT** be obtained during emergency phase of an accident.

12. When estimating DEQ I-131 dose rates using Attachment 2, Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System or Attachment 3, Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System, if dose rate meter configuration with respect to sample lines changes (Accident Sample Survey Point), dose rate value must be re-evaluated to verify correlation to 300 μCi/gm DEQ I-131.

13. A Safety Injection Actuation Signal (SIAS) isolates Component Cooling Water (CCW) flow to the primary sample heat exchangers. Therefore, have the affected control room reset the respective non-essential (N-header) CCW valves to reinitiate flow to the primary sample heat exchangers prior to sampling during accident conditions.

3.0 PREREQUISITES AND INITIAL CONDITIONS

NOTE

Attachment-specific prerequisites are included in individual Attachments.

3.1 Prerequisites

None

3.2 Materials

- RO-2 type radiation survey meter
- pipet
- sample bottle
- sample beaker
- graduated cylinder
- volumetric flask
- sample tray

3.3 Initial Conditions

None

4.0 INSTRUCTIONS

Procedure Use requirement in Section 4.1 is: REFERENCE USE

4.1 Accident Situation Guidelines

1. **REFER TO** EPIP-05, Activation and Operation of the Operational Support Center, for checklist items to establish OSC as operational.

2. **DETERMINE** plant status.

3. **ASSESS** process monitor operability.

4. **ASSESS** the following effluent flow paths to determine if abnormal release is in progress:

   - Plant Vent
   - Fuel Handling Building
   - ECCS Vent
   - Air Ejector Exhaust
   - Steam Line
   - S/G Blowdown Building Vent
   - S/G Liquid Blowdown
   - Containment

5. IF Containment Isolation Signal (CIS) has occurred, THEN **STOP** containment monitor skid sample pumps.

6. TSC Chemistry Supervisor **DETERMINE** necessity to establish analysis lab or to establish remote counting lab per procedure CY-SL-108-0007, Establishing Remote Laboratory for Analysis of Accident Samples.

7. **DETERMINE** which lab can be used for sample analysis.

4.1 Accident Situation Guidelines (continued)

NOTE

Health Physics can provide friskers or air sampling equipment.

8. **MONITOR** for noble gas concentration and radiation level in any lab area that is in use.

NOTE

TSC Chemistry Supervisor may waive Tech. Spec. requirement for RCS sampling when RCS DEQ I-131 is greater than 300 µCi/ml during accident conditions to limit personnel exposure, if requirements of ADM-17.09, Invoking 10 CFR 50.54(X) are met.

9. **DETERMINE** RCS or containment sump isotopic activity per applicable Attachment in this procedure.

   A. **REFER TO** Attachment 6, Contingency Plan for Post-Accident High Activity Samples for further guidance in collecting high activity samples. (Section 8.2, Commitment 1)

   B. IF directed, THEN **PERFORM** reactor coolant sample boron analysis.

   C. **NOTIFY** TSC Chemistry Supervisor of reactor coolant or containment sump isotopic or dose rate correlation results as soon as possible.

NOTE

Effluent monitors include Plant Vent, Fuel Handling Building and ECCS. Wide Range Gas Monitor (WRGM) high and low range samples are obtained per 2-NOP-26.01, Radiation Monitors. WRGM low range samples may also be obtained per CY-SL-104-2011, Unit 2 Gaseous Effluent Grab Sampling.

10. IF an effluent monitor is reading upscale AND WHEN conditions permit, THEN **OBTAIN** effluent sample for particulate, iodine and gas.

11. IF steam line monitor, air ejector monitor or steam generator blowdown monitors are reading upscale, THEN **OBTAIN** steam generator samples for evaluating primary to secondary leakage.

4.1 Accident Situation Guidelines (continued)

12. WHEN conditions permit, THEN **CONSIDER** sampling the following tanks for gross activity:

    - Chemical Drain Tank
    - Equipment Drain Tank
    - Aerated Waste Storage Tank
    - Spent Fuel Pool, if fuel handling accident
    - Main Condenser Hotwell, if primary to secondary leak has occurred

13. IF Component Cooling Water System (CCW) process monitors indicate increase in count rate, THEN **OBTAIN** CCW sample for isotopic analysis.

14. **AVOID** introducing sodium molybdate from CCW into waste ion exchangers to prevent unnecessary depletion.

15. IF necessary for containment hydrogen or isotopic analysis, THEN **OBTAIN** Post LOCA containment hydrogen analyzer samples, using Attachment 6, Contingency Plan for Post-Accident High Activity Samples as guidance for collecting high activity samples. (Section 8.2, Commitment 1)

16. **REFER TO** Attachment 1, Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance.

5.0 RESTORATION AND DOCUMENTATION

None

6.0 ACCEPTANCE AND FUNCTIONAL CRITERIA

None

7.0 RECORDS

Completed copies of the following attachments shall be transmitted to QA Records for retention in accordance with Processing Quality Assurance Records Program requirements.

- Attachment 2, Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
- Attachment 3, Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
- Attachment 4, Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
- Attachment 5, Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
- Attachment 7, Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
- Attachment 8, Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
- Attachment 9, Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
- Attachment 10, Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System

8.0 REFERENCES AND COMMITMENTS

8.1 References

8.1.1 Implementing

1. CY-SL-108-0007, Establishing Remote Laboratory for Analysis of Accident Samples
2. 2-NOP-26.01, Radiation Monitors
3. ADM-17.06, Independent Verification
4. ADM-17.09, Invoking 10 CFR 50.54(X)
5. CY-SL-102-0103, Operation of Ortec Gamma Spectroscopy System

8.1.1 Implementing (continued)

6. CY-SL-104-1010, Determination of Hydrogen Gas in Unit 1 Containment using Local Grab Sample

7. CY-SL-104-2010, Determination of Hydrogen Gas in Unit 2 Containment using Local Grab Sample

8. CY-SL-104-2011, Unit 2 Gaseous Effluent Grab Sampling

9. EPIP-05, Activation and Operation of the Operational Support Center

10. EPIP-09, Off-Site Dose Calculations

8.1.2 Developmental

1. Procedures

   - CY-SL-102-0025, Determination of Gases
   - 0-COP-06.06, Guidelines for Collecting Post Accident Samples
   - CY-SL-102-0033, Determination of Dose Equivalent Xe-133 For Reactor Coolant
   - CY-SL-104-1001, Unit 1 Primary Systems Sampling
   - CY-SL-104-1011, Unit 1 Gaseous Effluent Grab Sampling
   - CY-SL-104-2001, Unit 2 Primary Systems Sampling
   - CY-SL-104-2011, Unit 2 Gaseous Effluent Grab Sampling
   - EPIP-01, Classification of Emergencies
   - RP-SL-101-2000, Emergency Personnel Exposure Control
   - RP-SL-101-2001, Personnel Access Control During Emergencies

2. Calculation No: PSL-BF-01-081, Determination of Dose Rates Corresponding to 275 uCi/ml of DEQ I-131 in the RCS Sampling Lines for St. Lucie Units 1 and 2

3. CR 03-1178, Unexpected Condition While Opening V5200, Primary Coolant System

8.1.2 Developmental (continued)

4. P&ID 2998-G-078, Sheets 108, 109, 110, 120, 131, 132, 150 and 153

5. PSL-ENG-SEFJ-01-016, Rev. 1, Engineering Evaluation E-Plan Classification Dose Rate in Sampling Room Correlated to Coolant Concentration of 275 uCi/ml and 300 uCi/ml DEQ I-131

6. Unit 1 and Unit 2 Technical Specifications 3.4.8

7. Updated Final Safety Analysis Report (UFSAR)

   - Unit 1, Section 9.3.2, Tables 9.3-3 and 9.3-4
   - Unit 2, Section 9.3.2, Figures 9.3-3, 9.3-3A and 9.3-3B; Tables 9.3-3 and 9.3-4

8.1.3 Management Directives

1. CR 98-1212, V5202 is being used in a normally open state when designed to be normally closed (Attachment 2; Attachment 3; Attachment 4; Attachment 5; Attachment 9; Attachment 10)

8.2 Commitments

1. Plant License Amendment L-2000-131, Relief from Technical Specification and NUREG - 0737 Requirements for Post-Accident Sampling System. Approved amendments: Unit 1 #174, Unit 2 #114 (Section 1.0, Step 3; Section 1.0, Step 4; Section 4.1, Step 9.A; Section 4.1, Step 15; Attachment 2; Attachment 3; Attachment 4; Attachment 5; Attachment 6; Attachment 7; Attachment 8)

2. Plant License Amendment L-2001-047, Supplement to Proposed License Amendments (PLA) Application for Technical Specification Improvement to Eliminate Requirements for Post-Accident Sampling Systems Using the Consolidated Line Item Improvement Process (Attachment 6)

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
(Page 1 of 6)

Procedure Use requirement in Attachment 1 is: INFORMATION USE

NOTE

The following areas are evaluated by Chemistry Supervisor to determine what tests and scheduling frequency apply to each area:

- Containment Building
- Reactor Coolant (on Shutdown Cooling)
- Reactor Auxiliary Building CVCS Letdown System
- Gaseous Waste System
- Liquid Waste Systems
- Secondary Systems

1.0 AREAS TO BE MONITORED

1.1 Containment Building

1.1.1 Major Concerns

- Estimating initial inventory of water injected, total inventory in core and cavity sump including chemical and nuclide composition.
- Tracking additions to containment water volume.
- Tracking changes in nuclide mixture in water.
- Tracking atmospheric composition for percent gases and nuclide concentrations.
- Containment Sump, Quench Tank, Reactor Drain Tank composition.
- Containment purge or hydrogen purge that could release hot gases.
- Containment penetrations that could allow water out of or into containment.

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
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1.1.2 Actions to Consider

- **REVIEW** data from initial post-accident samples for tank levels and **COMPARE** to tank levels prior to incident.
- **CALCULATE** probable containment sump volume and boron concentration.
- **COMPARE** calculated data to actual grab sample results.
- **REVIEW** changes in valve lineups on lines that exit containment building for dose concerns.

1.2 Reactor Coolant on Shutdown Cooling (SDC)

1.2.1 Major Concerns

- Spread of contamination to associated systems.
- Any source of dilution water into shutdown cooling.
- Leaks in shutdown cooling heat exchanger to Component Cooling Water system.
- Adequate makeup supply to shutdown cooling.
- Contents of safeguard sumps.
- RAB liquid radwaste systems containing highly contaminated water.

1.2.2 Actions to Consider

- **VERIFY** there is **NO** boron dilution to shutdown cooling system by grab sampling SDC and makeup supply.
- **VERIFY** operation of Component Cooling Water process monitors for SDC leak detection.
    - **USE** grab samples to monitor the CCW activity, if necessary.

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
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1.3 Reactor Auxiliary Building CVCS Letdown System

1.3.1 Major Concerns

- Water with high levels of contamination may be in RAB.
- VCT may have hydrogen cover gas with high noble gas activity.
- Water in letdown system may be at lower boron concentration than SDC system and act as source of dilution water.
- CVCS ion exchangers may **NOT** be borated to same concentration as SDC system and could remove boron until equilibrium is reached.
- Gaseous waste system may contain high gas activity from tank vents or VCT purges.
- CVCS ion exchangers may contain dose rates higher than shielding design.

1.3.2 Actions to Consider

- **DETERMINE** isotopic content of VCT gas by grab sampling.
- **MONITOR** Plant Vent process monitor for abnormal gaseous releases.
- **MONITOR** any water movements through RAB for high activity.

NOTE

Preconcentrator ion exchanger can be used for cleanup of HUTs prior to waste processing.

- **OBTAIN** Holdup Tank samples for high activity analysis.

1.4 Gaseous Waste System

1.4.1 Major Concerns

- Gas decay tanks (GDTs) may be filled faster than usual. There may be less time available for decay of high activity.

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
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1.4.1 Major Concerns (continued)

- Oxygen may be introduced into GDTs from improper valve lineups. Tanks should be monitored for explosive gas mixtures.
- Nitrogen supply aligned to non-essential equipment may fill GDTs.
- Improper valve lineups may release high activity gas or explosive gas mixtures into RAB.

1.4.2 Actions to Consider

CAUTION

Gas analyzer shall **NOT** be aligned to highly radioactive GDT, to avoid damage to or extreme contamination of gas analyzer.

- **ALIGN** Gas Analyzer to Gas Surge Header for operation.
- **MONITOR** GDT pressures closely.
- **VERIFY** explosive gas mixtures are **NOT** formed by performing routine grab sampling.

1.5 Liquid Waste Systems

1.5.1 Major Concerns

- Spread of highly contaminated water in RAB.
- Tank levels and sump levels that have auto starting pumps contributing to spread of contamination.
- Tanks and sumps allowed to overflow.
- Chemical contaminants such as sodium hydroxide, hydrazine or trisodium phosphate rapidly depleting ion exchangers.
- Draining sections of piping that contain highly radioactive water.

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
(Page 5 of 6)

1.5.2 Actions to Consider

- **ISOLATE**, if possible, any source of highly radioactive water in RAB waste system.
- **ESTABLISH** controls of RAB water movements.
- **MONITOR** tank levels and sump levels on more frequent basis.
- **VERIFY** waste ion exchangers are performing proper cleanup of waste water.
- **REQUEST** that circulating water pumps be left in operation for adequate dilution flow for liquid releases.
- **CONSIDER** having to process very large volumes of waste water from S/G tube rupture.

1.6 Secondary Systems

1.6.1 Major Concerns

- Containing spread of contamination.
- Treatment of large volumes of contaminated water.
- Restricted use of chemicals in systems.
- Blowdown system is direct release path to discharge canal.
- Control of contaminated water in condenser hotwell.

1.6.2 Actions to Consider

- **MONITOR** ponds for contamination by obtaining grab samples.
- **SECURE** vacuum drag after S/G tube rupture to avoid contamination of other unit.
- Properly **HANDLE** blowdown building resin trains that may be contaminated for resin discharge.

ATTACHMENT 1
Guidelines for Monitoring Areas of Concern for Long Term Post-Accident Surveillance
(Page 6 of 6)

1.6.2 Actions to Consider (continued)

- **MINIMIZE** use of amerzine and hydrazine on secondary side to avoid depletion of ion exchangers used for waste processing of contaminated water.

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 1 of 7)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 2 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for estimating Unit 1 RCS Dose Equivalent Iodine-131 (DEQ I-131) activity using normal Primary Sample System during an emergency.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Hot Leg sample line shall **NOT** have system pressure applied without sample vessel installed or disconnect fittings plugged.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.
2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.
3. Operations shall have V6307, 1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 2 of 7)

2.2 Limitations (continued)

4. If CIS has occurred, solenoid valves to sample RCS, V5200, 1A HOT LEG LOOP SAMPLE ISOL, and V5203, 1A HOT LEG LOOP SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

5. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1)

6. Sample line radiation measurements shall be taken "on contact" at "Accident Sample Survey Point" using RO-2 type radiation survey meter. Placing survey meter "on contact" physically places its detector 1 inch from sample line.

7. If dose rate meter configuration with respect to sample lines changes (Accident Sample Survey Point), dose rate value must be re-evaluated to verify correlation to 300 µCi/gm DEQ I-131.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

5. **CONFIRM** Radiation Protection to provide RP coverage during sample system recirculation / flush evolutions.

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 3 of 7)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 2, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 2, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose.

4.2 Recirculating / Flushing RCS Hot Leg Sample Line

1. IF RCS Hot Leg sample is already lined up to the VCT, THEN **GO TO** Attachment 2, Section 4.2, Step 8.
2. IF CIS has occurred, THEN **REQUEST** Control Room to override CIS signal and reset V5200, 1A HOT LEG LOOP SAMPLE ISOL, and V5203, 1A HOT LEG LOOP SAMPLE ISOL.
3. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5138	SAMPLE SINK RC SAMPLE ISOL	CLOSED	
V5103	RC SAMPLE VESSEL INLET ISOL	CLOSED	
V5104	RC SAMPLE VESSEL OUTLET ISOL	CLOSED	
V5102	RC SAMPLE VESSEL ASSEMBLY INLET ISOL	CLOSED	
V5105	RC SAMPLE VESSEL ASSEMBLY OUTLET ISOL	CLOSED	
V5106	RC SAMPLE VESSEL ASSEMBLY BYPASS	CLOSED	
V05015	RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL	CLOSED	
V5107	RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE	CLOSED	
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 4 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

4. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5150	PURGE TO FLASH TANK ISOL	CLOSED	
V5152	PURGE TO VCT ISOL	OPEN	

5. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5150	PURGE TO FLASH TANK ISOL	OPEN	
V5152	PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

6. **OPEN** the following valves in order listed, from sample room:

Valve	Description	Required Position	Aligned By
V5200	1A HOT LEG LOOP SAMPLE ISOL	OPEN	
V5203	1A HOT LEG LOOP SAMPLE ISOL	OPEN	
V5106	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	
V05015	RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL	OPEN	

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
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4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

NOTE

0.8 gpm is preferred flow rate.

CAUTION

- Dose rates will increase dramatically after RCS sample flow has been established by opening V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

7. **THROTTLE OPEN** V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

8. **MOVE** to area with lower dose rates.

9. **REQUEST** RP to monitor sample room dose rates as necessary.

10. **ALLOW** RCS to recirculate / flush for amount of time it takes for at least 8 gallons to recirculate / flush, e.g. 10 minutes at 0.8 gpm.

NOTE

- Sample line radiation measurements shall be taken "on contact" using RO-2 type radiation survey meter.
- RO-2 survey meter placement is determined by Chemistry technician, who will indicate to RP technician where to place meter.

11. **REQUEST** RP to measure dose rate on sample line at "Accident Sample Survey Point".

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 6 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

12. **RECORD** sample line (Accident Sample Survey Point) dose rate:

Dose rate reading: _____

13. **IDENTIFY** corresponding estimated RCS DEQ I-131 activity for dose rate reading in table, by circling corresponding activity.

Dose Rate Reading	RCS DEQ I-131 Activity
< 1.3 R/hr	< 300 µCi/gm
1.3 R/hr	300 µCi/gm
> 1.3 R/hr	> 300 µCi/gm

NOTE

- RCS DEQ I-131 activity value is important decision-making information for Shift Manager (SM) / Emergency Coordinator (EC).
- This step is considered complete whether SM / EC is contacted directly or indirectly through OSC Chemistry Supervisor. Expectation is that SM / EC receives this information as soon as possible.

14. As soon as possible, **PROVIDE** estimated RCS DEQ I-131 activity from Attachment 2, Section 4.2, Step 13 to SM / EC.

15. IF dose rate reading is greater than 1.3 R/hr, THEN **GO TO** Attachment 2, Section 4.2, Step 17 to secure sample lineup.

16. IF dose rate reading is less than or equal to 1.3 R/hr AND sample is requested by EC, THEN **GO TO** Attachment 4, Section 4.2, Lab Preparations.

ATTACHMENT 2
Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 7 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

17. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED		
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED		
V5145	SAMPLE SINK DMW ISOL	CLOSED	NA	
V5138	SAMPLE SINK RC SAMPLE ISOL	CLOSED	NA	
V5150	PURGE TO FLASH TANK ISOL	CLOSED		
V5152	PURGE TO VCT ISOL	CLOSED		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

18. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 2, Section 4.2, Step 5, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H\U Tanks

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 1 of 7)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 3 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for estimating Unit 2 RCS Dose Equivalent Iodine-131 (DEQ I-131) activity using normal Primary Sample System during an emergency.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Hot Leg sample line shall **NOT** have system pressure applied without sample vessel installed or disconnect fittings plugged.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.
2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.
3. Operations shall have V6307, FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 2 of 7)

2.2 Limitations (continued)

4. If CIS has occurred, solenoid valves to sample RCS, V5200, RCS HOT LEG SAMPLE ISOL, and V5203, RCS HOT LEG SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

5. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1)

6. Sample line radiation measurements shall be taken "on contact" at "Accident Sample Survey Point" using RO-2 type radiation survey meter. Placing survey meter "on contact" physically places its detector 1 inch from sample line.

7. If dose rate meter configuration with respect to sample lines changes (Accident Sample Survey Point), dose rate value must be re-evaluated to verify correlation to 300 µCi/gm DEQ I-131.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

5. **CONFIRM** Radiation Protection to provide RP coverage during sample system recirculation / flush evolutions.

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 3 of 7)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 3, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 3, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose.

4.2 Recirculating / Flushing RCS Hot Leg Sample Line

1. IF RCS Hot Leg sample is already lined up to VCT, THEN **GO TO** Attachment 3, Section 4.2, Step 8.
2. IF CIS has occurred, THEN **REQUEST** Control Room to override CIS signal and reset V5200, RCS HOT LEG SAMPLE ISOL, and V5203, RCS HOT LEG SAMPLE ISOL.
3. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5138	SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL	CLOSED	
V5103	RC SAMPLE VESSEL INLET ISOL	CLOSED	
V5104	RC SAMPLE VESSEL OUTLET ISOL	CLOSED	
V5303	RC SAMPLE VESSEL ASSEMBLY INLET	CLOSED	
V5305	RC SAMPLE VESSEL ASSEMBLY OUTLET	CLOSED	
V5304	RC SAMPLE VESSEL ASSEMBLY BYPASS	CLOSED	
V5107	RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE	CLOSED	
V05311	SAMPLE HEAT EXCHANGER 2A & 2B CROSS TIE	CLOSED	
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED	
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED	

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 4 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

4. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN	

5. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	OPEN	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

NOTE

V5200, RCS HOT LEG SAMPLE ISOL, may **NOT** open or indicate open until V5203, RCS HOT LEG SAMPLE ISOL, is opened.

6. **OPEN** the following valves:

Valve	Description	Required Position	Aligned By
V5203	RCS HOT LEG SAMPLE ISOL	OPEN	
V5200	RCS HOT LEG SAMPLE ISOL	OPEN	
V5304	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 5 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

NOTE

0.8 gpm is preferred flow rate.

CAUTION

- Dose rates will increase dramatically after RCS sample flow has been established by opening V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

7. **THROTTLE OPEN** V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

8. **MOVE** to area with lower dose rates.

9. **REQUEST** RP to monitor sample room dose rates as necessary.

10. **ALLOW** RCS to recirculate / flush for amount of time it takes for at least 8 gallons to recirculate / flush, e.g. 10 minutes at 0.8 gpm.

NOTE

- Sample line radiation measurements shall be taken "on contact" using RO-2 type radiation survey meter.
- RO-2 survey meter placement is determined by Chemistry technician, who will indicate to RP technician where to place meter.

11. **REQUEST** RP to measure dose rate on sample line at "Accident Sample Survey Point".

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 6 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

12. **RECORD** sample line (Accident Sample Survey Point) dose rate:

Dose rate reading: _____

13. **IDENTIFY** corresponding estimated RCS DEQ I-131 activity for dose rate reading in table, by circling corresponding activity.

Dose Rate Reading	RCS DEQ I-131 Activity
< 1.3 R/hr	< 300 µCi/gm
1.3 R/hr	300 µCi/gm
> 1.3 R/hr	> 300 µCi/gm

NOTE

- RCS DEQ I-131 activity value is important decision-making information for Shift Manager (SM) / Emergency Coordinator (EC).
- This step is considered complete whether SM / EC is contacted directly or indirectly through OSC Chemistry Supervisor. Expectation is that SM / EC receives this information as soon as possible.

14. As soon as possible, **PROVIDE** estimated RCS DEQ I-131 activity from Attachment 3, Section 4.2, Step 13 to SM / EC.

15. IF dose rate reading is greater than 1.3 R/hr, THEN **GO TO** Attachment 3, Section 4.2, Step 17 to secure sample lineup.

16. IF dose rate reading is less than or equal to 1.3 R/hr AND sample is requested by EC, THEN **GO TO** Attachment 5, Section 4.2, Lab Preparations.

ATTACHMENT 3
Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System
(Page 7 of 7)

4.2 Recirculating / Flushing RCS Hot Leg Sample Line (continued)

17. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED		
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED		
V5145	SAMPLE SINK DWS ISOL	CLOSED	NA	
V5138	RC SAMPLE VESSEL INLET ISOL	CLOSED	NA	
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED		
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

18. IF **NO** further sampling is required AND Flash Tank was used for recirculating / flushing per Attachment 3, Section 4.2, Step 5, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H/U Tanks

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 1 of 7)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 4 is: CONTINUOUS USE

1.0 PURPOSE

1. To provide instructions for obtaining emergency Unit 1 RCS sample from normal Primary Sample System when Dose Equivalent Iodine-131 (DEQ I-131) is less than or equal to 300 µCi/gm as determined per Attachment 2, Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System.

2. To provide instructions for obtaining Unit 1 RCS sample from normal Primary Sample System during recovery phase of an accident (post-accident) in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Hot Leg sample line shall **NOT** have system pressure applied without sample vessel installed or disconnect fittings plugged.
3. Exposure to reactor coolant samples should be minimized to keep dose as low as possible.
4. Sample temperatures should be less than 120°F.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 2 of 7)

2.2 Limitations

1. IF Reactor Coolant System DEQ Iodine-131 is greater than 300 µCi/gm as determined per Attachment 2, Estimating Unit 1 RCS DEQ I-131 Activity Using Normal Primary Sample System, THEN samples shall **NOT** be obtained during emergency phase of an accident.

2. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.

3. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

4. Operations shall have V6307, 1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

5. If CIS has occurred, solenoid valves to sample RCS, V5200, 1A HOT LEG LOOP SAMPLE ISOL, and V5203, 1A HOT LEG LOOP SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

6. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1).

7. During recovery phase, Attachment 6, Contingency Plan for Post-Accident High Activity Samples, should be used for additional guidelines, considerations and recommendations.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 3 of 7)

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **CONFIRM** Radiation Protection to provide RP coverage during emergency RCS sampling evolutions per OSC procedures.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 4 of 7)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 4, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 4, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose.

4.2 Lab Preparations

NOTE

One technique to obtain 999 ml demineralized water is to fill 1000 ml volumetric flask to calibrated mark, remove 1.0 ml, then add flask contents to 1 liter poly bottle.

1. **ADD** 999 ml of demineralized water to clean 1 liter poly bottle.
2. **PLACE** 1.0 ml pipet and sample bottle in sample tray.

4.3 Obtaining Diluted RCS Hot Leg Sample

1. **ENSURE** sample tray from Attachment 4, Section 4.2 is taken to sample room.
2. **ENSURE** Attachment 2, Section 4.2, Step 1 through Attachment 2, Section 4.2, Step 16 are complete.
3. **PLACE** sample beaker under V5138, SAMPLE SINK RC SAMPLE ISOL, and **PLACE** tygon tubing inside beaker.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 5 of 7)

4.3 Obtaining Diluted RCS Hot Leg Sample (continued)

NOTE

Rinsing sink will reduce airborne radioactivity and minimize contamination.

4. **OPEN** V5145, SAMPLE SINK DMW ISOL, to begin rinsing sink.

5. Slowly **OPEN** V5138, SAMPLE SINK RC SAMPLE ISOL, to flush beaker.

6. WHEN 30 seconds of flushing has elapsed, THEN **CLOSE** V5138, SAMPLE SINK RC SAMPLE ISOL.

7. **NOTE** sample date and time.

   Date: _____ Time: _____

NOTE

Waiting for 3 minutes to pipet sample after sample valve is closed provides time for fume hood ventilation system to remove noble gases, which reduces radiation exposure.

8. **WAIT** 3 minutes.

9. **REQUEST** RP to monitor for airborne particulate, iodine and noble gas activity in vicinity of chemistry technician.

10. Using pipet **ADD** 1.0 ml of sample from sample beaker to sample bottle containing 999 ml demineralized water.

11. **CAP** sample bottle.

12. **FLUSH** sample sink and sample bottle with demineralized water.

13. **CLOSE** V5145, SAMPLE SINK DMW ISOL.

14. **WIPE** sample bottle and **PLACE** bottle into sample tray.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 6 of 7)

4.3 Obtaining Diluted RCS Hot Leg Sample (continued)

15. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED		
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED		
V5145	SAMPLE SINK DMW ISOL	CLOSED	NA	
V5138	SAMPLE SINK RC SAMPLE ISOL	CLOSED	NA	
V5102	RC SAMPLE VESSEL ASSEMBLY INLET ISOL	CLOSED		
V5150	PURGE TO FLASH TANK ISOL	CLOSED		
V5152	PURGE TO VCT ISOL	CLOSED		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

16. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 2, Section 4.2, Step 5, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H\U Tanks

17. **TRANSPORT** sample to lab.

4.4 Sample Isotopic Analysis

1. **TRANSFER** 16.0 ml sample into scintillation vial.

2. **PERFORM** gamma isotopic analysis of scintillation vial sample using 0.016 ml for counting volume per CY-SL-102-0103, Operation of Ortec Gamma Spectroscopy System.

3. WHEN report is printed, THEN **ENSURE** all information is correct.

ATTACHMENT 4
Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System
(Page 7 of 7)

4.4 Sample Isotopic Analysis (continued)

NOTE

Sample results may be necessary to evaluate emergency conditions and Emergency Plan Classification criteria.

4. As soon as possible, **PROVIDE** results to OSC Chemistry Supervisor.

5. **RECORD** sample results in CDMS.

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 1 of 7)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 5 is: CONTINUOUS USE

1.0 PURPOSE

1. To provide instructions for obtaining emergency Unit 2 RCS sample from normal Primary Sample System when Dose Equivalent Iodine-131 (DEQ I-131) is less than or equal to 300 µCi/gm as determined per Attachment 3, Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System.

2. To provide instructions for obtaining Unit 2 RCS sample from normal Primary Sample System during recovery phase of an accident (post-accident) in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Hot Leg sample line shall **NOT** have system pressure applied without sample vessel installed or disconnect fittings plugged.
3. Exposure to reactor coolant samples should be minimized to keep dose as low as possible.
4. Sample temperatures should be less than 120°F.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 2 of 7)

2.2 Limitations

1. IF Reactor Coolant System DEQ Iodine-131 is greater than 300 µCi/gm as determined per Attachment 3, Estimating Unit 2 RCS DEQ I-131 Activity Using Normal Primary Sample System, THEN samples shall **NOT** be obtained during emergency phase of an accident.

2. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.

3. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

4. Operations shall have V6307, FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

5. If CIS has occurred, solenoid valves to sample RCS, V5200, RCS HOT LEG SAMPLE ISOL, and V5203, RCS HOT LEG SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

6. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1).

7. During recovery phase, Attachment 6, Contingency Plan for Post-Accident High Activity Samples, should be used for additional guidelines, considerations and recommendations.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 3 of 7)

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **CONFIRM** Radiation Protection to provide RP coverage during emergency RCS sampling evolutions per OSC procedures.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 4 of 7)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 5, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 5, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose.

4.2 Lab Preparations

NOTE

One technique to obtain 999 ml demineralized water is to fill 1000 ml volumetric flask to calibrated mark, remove 1.0 ml, then add flask contents to 1 liter poly bottle.

1. **ADD** 999 ml of demineralized water to clean 1 liter poly bottle.
2. **PLACE** 1.0 ml pipet and sample bottle in sample tray.

4.3 Obtaining Diluted RCS Hot Leg Sample

1. **ENSURE** sample tray from Attachment 5, Section 4.2 is taken to sample room.
2. **ENSURE** Attachment 3, Section 4.2, Step 1 through Attachment 3, Section 4.2, Step 16 are complete.
3. **PLACE** sample beaker under V5138, SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL, and **PLACE** tygon tubing inside beaker.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 5 of 7)

4.3 Obtaining Diluted RCS Hot Leg Sample (continued)

NOTE

Rinsing sink will reduce airborne radioactivity and minimize contamination.

4. **OPEN** V5145, SAMPLE SINK DWS ISOL, to begin rinsing sink.

5. Slowly **OPEN** V5138, SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL, to flush beaker.

6. WHEN 30 seconds of flushing has elapsed, THEN **CLOSE** V5138, SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL.

7. **NOTE** sample date and time.

   Date: _____ Time: _____

NOTE

Waiting for 3 minutes to pipet sample after sample valve is closed provides time for fume hood ventilation system to remove noble gases, which reduces radiation exposure.

8. **WAIT** 3 minutes.

9. **REQUEST** RP to monitor for airborne particulate, iodine and noble gas activity in vicinity of chemistry technician.

10. Using pipet **ADD** 1.0 ml of sample from sample beaker to sample bottle containing 999 ml demineralized water.

11. **CAP** sample bottle.

12. **FLUSH** sample sink and sample bottle with demineralized water.

13. **CLOSE** V5145, SAMPLE SINK DWS ISOL.

14. **WIPE** sample bottle and **PLACE** bottle into sample tray.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 6 of 7)

4.3 Obtaining Diluted RCS Hot Leg Sample (continued)

15. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED		
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED		
V5145	SAMPLE SINK DWS ISOL	CLOSED	NA	
V5138	RC SAMPLE VESSEL INLET ISOL	CLOSED	NA	
V5303	RC SAMPLE VESSEL ASSEMBLY INLET	CLOSED		
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED		
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

16. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 3, Section 4.2, Step 5, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H/U Tanks

17. **TRANSPORT** sample to lab.

4.4 Sample Isotopic Analysis

1. **TRANSFER** 16.0 ml sample into scintillation vial.

2. **PERFORM** gamma isotopic analysis of scintillation vial sample using 0.016 ml for counting volume per CY-SL-102-0103, Operation of Ortec Gamma Spectroscopy System.

3. WHEN report is printed, THEN **ENSURE** all information is correct.

ATTACHMENT 5
Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System
(Page 7 of 7)

4.4 Sample Isotopic Analysis (continued)

NOTE

Sample results may be necessary to evaluate emergency conditions and Emergency Plan Classification criteria.

4. As soon as possible, **PROVIDE** results to OSC Chemistry Supervisor.

5. **RECORD** sample results in CDMS.

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 1 of 7)

(Section 8.2, Commitment 1, Section 8.2, Commitment 2)

Procedure Use requirement in Attachment 6 is: REFERENCE USE

1.0 DISCUSSION

Per FPL letters L-2000-131 and L-2001-047, St. Lucie Plant has developed contingency plans to obtain and analyze highly radioactive post-accident samples from reactor coolant system, containment sump, and containment atmosphere. Attachment 6, Contingency Plan for Post-Accident High Activity Samples, provides guidance for obtaining and analyzing these samples.

2.0 CONTINGENCY PLAN APPLICABILITY

This contingency plan should be used following a plant event where it is expected that significant core damage occurs. This event will likely result in implementation of the St. Lucie Plant Radiological Emergency Plan (Emergency Plan). Contingency plan activities do **NOT** supersede any actions or activities performed per Emergency Plan or plant procedures.

Decision to perform any activities in Attachment 6, Contingency Plan for Post-Accident High Activity Samples are at discretion of Emergency Coordinator, Recovery Manager, or manager responsible for plant specific activities.

There is **NO** minimum time limit for activities resulting from Attachment 6, Contingency Plan for Post-Accident High Activity Samples. Considerations for necessity to perform post-accident sampling, planning or resource procurement time, obtaining vendor support, and dose rate reductions from radioisotope decay may indefinitely postpone or cancel decision to sample.

Personnel emergency exposure guidelines should be reviewed prior to any decision to perform activities per this attachment.

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 2 of 7)

3.0 CONTINGENCY PLAN GUIDELINES

3.1 Considerations

Actual value to be gained from obtaining highly radioactive post-accident samples should be determined prior to initiating sample activities. The following considerations should be reviewed and subsequent sampling activities authorized by Emergency Coordinator, Recovery Manager, or manager responsible for plant specific activities prior to sampling initiation:

1. **CONSIDER** alternate established means to obtain information.

   Examples:

   - Core damage assessment emergency plan implementing procedures
   - Dose rate correlation calculations
   - Similarity to historical event results such as TMI.

2. **CONSIDER** timeliness of sample information in relation to expected onset of recovery related activities.

   Example:

   - Additional decay time for radioisotopes could be allowed before planned sampling if RCS clean-up activities are **NOT** scheduled to start, or do **NOT** need to be started for some time.

3. **CONSIDER** information gained from performing other activities. IF scope or activities will not change significantly with or without sampling, THEN **CONSIDER** postponing sampling.

   Examples:

   - How RCS clean up impacts CVCS filters and resin beds
   - Post-accident containment entries
   - Core damage estimates verified from other means

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 3 of 7)

3.1 Considerations (continued)

4. **CONSIDER** need or expectation to resample at a later time.

5. IF likely that later samples will also be taken, THEN **CONSIDER** postponing earlier sample to preserve personnel dose, resources, and equipment.

NOTE

- Core damage accident will probably result in initiation of Containment Spray, HPSI, SIT and LPSI. After RWT level has decreased to a specified level, valves will re-align to recirculate borated water in Containment Sump through the core via LPSI pumps. After long-term recirculation it can be assumed that radioisotope concentrations in RCS and Containment Sump are similar. In this scenario, RCS Hot Leg samples taken from normal Primary Sample System will be representative of activity in Containment Sump.
- Sample locations to determine or estimate Containment Sump conditions in order of preference are RCS Hot Leg and LPSI pump discharge.
- The following are guidelines, considerations, and recommendations applicable to sampling RCS Hot Leg or LPSI pump discharge.

3.2 Post-Accident Liquid Sample Contingency Plan Guidelines

1. Prior to valve line up for sample, **ESTIMATE** dose rate effects, including effects on airborne dose rates from sample valve venting, based on estimated core damage assessment or other means.

2. IF conditions warrant additional shielding, THEN **MOVE** portable shield racks and shielding around sample area and associated piping in sample room.

   - **CONSIDER** additional shielding around sample collection container in sink, if appropriate.

   - **REFER TO** Attachment 11, Shielding Layout for examples for positioning portable shield racks.

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 4 of 7)

3.2 Post-Accident Liquid Sample Contingency Plan Guidelines (continued)

3. **REVIEW** activities, both current and planned, for potentially affected areas in sample flow path, including impact on Volume Control Tank and Liquid Waste System for small additions of highly radioactive liquid.

4. **COORDINATE** sample reentry activities with RP, Operations, and other applicable departments.

5. **ENSURE** that extremity TLDs, emergency exposure authorizations, and contingency radiological plans are reviewed in detail with sample reentry teams.

6. **CONSIDER** sample mock-up practices on unaffected unit to improve sample activity efficiency and team response.

7. **DETERMINE** dilution volumes, counting geometry, and analysis methodology.

   - **COMPARE** these to instructions in applicable Attachment 4, Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System, Attachment 5, Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System, Attachment 7, Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample, or Attachment 8, Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample.

   - **DETERMINE** if any changes to procedures should be made as result of specific plant conditions, unexpected dose rates, etc.

     - **PERFORM** procedure changes per plant procedures, as necessary.

8. **PROVIDE** shortest possible transfer time from sink to dilution container by placing dilution container with proper water dilution volume, and sample pipet device in sample room.

9. **CONSIDER** placing shielding around sample beaker and dilution container.

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 5 of 7)

3.2 Post-Accident Liquid Sample Contingency Plan Guidelines (continued)

10. **CONSIDER** obtaining and storing undiluted sample per Attachment 9, Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System, or per Attachment 10, Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System, for later analysis.

11. **STORE** diluted samples behind shielding or in lead storage locker whenever analyses are **NOT** in progress.

12. **DETERMINE** if support or resources from Turkey Point are necessary or available.

13. **DETERMINE** if additional vendor support is warranted.

- **OBTAIN** vendor services per plant procedures.
- **USE** INPO member plant resources agreement, as appropriate, to expedite resource procurement.

14. WHEN all departments and reentry teams are prepared and briefed, THEN **INITIATE** valve line up and sampling per applicable Attachment 4, Obtaining Emergency Unit 1 Diluted RCS Sample from Normal Primary Sample System, Attachment 5, Obtaining Emergency Unit 2 Diluted RCS Sample from Normal Primary Sample System, Attachment 7, Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample, or Attachment 8, Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample.

15. WHEN sampling and analysis are completed, THEN **PROVIDE** results to Emergency Coordinator, Recovery Manager or specific responsible manager.

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 6 of 7)

NOTE

- Containment Hydrogen Analyzers monitor containment atmospheric hydrogen during accident conditions.
- Containment noble gas and iodine activity correlations can be made using Containment High Range Radiation Monitors (CHRRMS) and guidance from EPIP-09, Off-Site Dose Calculations. If CHRRMS unavailable, containment grab samples can be obtained.
- Local grab samples for hydrogen concentration and isotopic analysis can be obtained from Containment Hydrogen Analyzers per CY-SL-104-1010, Determination of Hydrogen Gas in Unit 1 Containment using Local Grab Sample, or CY-SL-104-2010, Determination of Hydrogen Gas in Unit 2 Containment using Local Grab Sample. Grab sample carts, with sample bombs, are shielded and considerations for high activity samples have been reviewed for this system.
- The following are guidelines for obtaining grab samples from Containment Hydrogen Analyzers.

3.3 Post-Accident Containment Atmosphere Sample Contingency Plan Guidelines

1. **REVIEW** CY-SL-104-1010, Determination of Hydrogen Gas in Unit 1 Containment using Local Grab Sample, or CY-SL-104-2010, Determination of Hydrogen Gas in Unit 2 Containment using Local Grab Sample, for obtaining and analyzing containment atmosphere sample.

NOTE

Venting evolutions at local grab sample station and in lab may cause applicable effluent monitor to go into ALERT alarm.

2. **USE** caution to ensure effluent monitor HIGH alarm is **NOT** reached.
3. **DETERMINE** if any changes to procedures should be made as result of specific plant conditions, unexpected dose rates, etc.
    - **PERFORM** procedure changes per plant procedures, as necessary.

ATTACHMENT 6
Contingency Plan for Post-Accident High Activity Samples
(Page 7 of 7)

3.3 Post-Accident Containment Atmosphere Sample Contingency Plan Guidelines (continued)

4. **COORDINATE** sample reentry activities with RP, Operations, and other applicable departments.

5. **ENSURE** that extremity TLDs, emergency exposure authorizations, and contingency radiological plans are reviewed in detail with sample reentry teams.

6. **CONSIDER** sample mock-up practices on unaffected unit to improve sample activity efficiency and team response.

7. IF analysis of undiluted sample is **NOT** immediate, THEN **STORE** sample in area determined by RP until analysis is performed.

8. **DETERMINE** if support or resources from Turkey Point are necessary or available.

9. **DETERMINE** if additional vendor support is warranted.

   - **OBTAIN** vendor services per plant procedures.
   - **USE** INPO member plant resources agreement, as appropriate, to expedite resource procurement.

10. WHEN all departments and reentry teams are prepared and briefed, THEN **INITIATE** valve line up and sampling per CY-SL-104-1010, Determination of Hydrogen Gas in Unit 1 Containment using Local Grab Sample, or CY-SL-104-2010, Determination of Hydrogen Gas in Unit 2 Containment using Local Grab Sample.

11. WHEN sampling and analysis are completed, THEN **PROVIDE** results to Emergency Coordinator, Recovery Manager or specific responsible manager.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 1 of 10)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 7 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for obtaining Unit 1 diluted Containment Sump sample (Low Pressure Safety Injection (LPSI) pump sample) during recovery phase of accident in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Exposure to containment sump samples should be minimized to keep dose as low as possible.
3. Sample temperatures should be less than 120°F.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.
2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 2 of 10)

2.2 Limitations (continued)

3. Operations shall have V6307, 1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

4. Attachment 7, Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample may be used if either LPSI pump is running.

5. Attachment 6, Section 3.2 should be referred to for additional guidelines, considerations and recommendations.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** applicable portion of Primary Sample System is operational.

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **ENSURE** Radiation Protection has issued specific RWP.

7. **CONFIRM** Radiation Protection to provide RP coverage during recovery phase RCS sampling evolutions.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 3 of 10)

3.0 PREREQUISITES (continued)

8. **VERIFY** in-service LPSI pump is recirculating borated water through reactor core.

9. **VERIFY NO** other sample lines are lined up to recirculate or flush to VCT or Flash Tank.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 4 of 10)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 7, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 7, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose, including use of shielding.
- **COMMUNICATE** specific RWP requirements.

4.2 Lab Preparations

NOTE

One technique to obtain 999 ml demineralized water is to fill 1000 ml volumetric flask to calibrated mark, remove 1.0 ml, then add flask contents to 1 liter poly bottle.

1. **ADD** 999 ml of demineralized water to clean 1 liter poly bottle.
2. **PLACE** 1.0 ml pipet and sample bottle in sample tray.

4.3 Recirculating / Flushing LPSI Pump Sample Line

1. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5141	SAMPLE SINK 1D SAMPLE ISOL	CLOSED	
V5128	1D SAMPLE HX OUTLET SAMPLE THROTTLE	CLOSED	
V05017	1D SAMPLE HX OUTLET SAMPLE INLET	OPEN	

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 5 of 10)

4.3 Recirculating / Flushing LPSI Pump Sample Line (continued)

2. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5150	PURGE TO FLASH TANK ISOL	CLOSED	
V5152	PURGE TO VCT ISOL	OPEN	

3. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5150	PURGE TO FLASH TANK ISOL	OPEN	
V5152	PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 6 of 10)

4.3 Recirculating / Flushing LPSI Pump Sample Line (continued)

NOTE

- Attachment 7, Section 4.3, Step 4 valves are located on west wall of area adjacent to Pipe Penetration Room.
- V5127, 1D SAMPLE HX INLET FROM 1A LPSI PUMP DISCH ISOL, should be only valve requiring repositioning.
- Attachment 7, Section 4.3, Step 4 is only intended to be performed for first LPSI sample.

WARNING

Due to possibility of high dose rates in the area,
Attachment 7, Section 4.3, Step 4 should be performed as quickly as possible.

4. **PERFORM** the following valve lineup for first LPSI sample only:

Valve	Description	Required Position	Aligned By
V5161	1D SAMPLE HX INLET FROM SDC SUCTION ISOL	CLOSED	
V5130	1D SAMPLE HX INLET FROM HPSI PUMPS MIN FLOW ISOL	CLOSED	
V05010	1D SAMPLE HX INLET FROM SITS ISOL	CLOSED	
V5127	1D SAMPLE HX INLET FROM 1A LPSI PUMP DISCH ISOL	OPEN	

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 7 of 10)

4.3 Recirculating / Flushing LPSI Pump Sample Line (continued)

NOTE

0.8 gpm is preferred flow rate.

CAUTION

- Dose rates will increase dramatically after LPSI sample flow has been established by opening V5128, 1D SAMPLE HX OUTLET SAMPLE THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

5. **THROTTLE OPEN** V5128, 1D SAMPLE HX OUTLET SAMPLE THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

6. **MOVE** to area with lower dose rates.

7. **REQUEST** RP to monitor sample room dose rates as necessary.

8. **REQUEST** RP to perform general area radiation surveys at designated flush location (VCT or Flash Tank) to monitor increase in dose rates.

9. **ALLOW** sample line to recirculate / flush for amount of time it takes for at least 8 gallons to recirculate / flush, e.g. 10 minutes at 0.8 gpm.

4.4 Obtaining Diluted LPSI Pump Sample

1. **ENSURE** sample tray from Attachment 7, Section 4.2 is taken to sample room.

2. **PLACE** sample beaker under V5141, SAMPLE SINK 1D SAMPLE ISOL, and **PLACE** tygon tubing inside beaker.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 8 of 10)

4.4 Obtaining Diluted LPSI Pump Sample (continued)

NOTE

Rinsing sink will reduce airborne radioactivity and minimize contamination.

3. **OPEN** V5145, SAMPLE SINK DMW ISOL, to begin rinsing sink.

4. Slowly **OPEN** V5141, SAMPLE SINK 1D SAMPLE ISOL, to flush beaker.

5. WHEN 30 seconds of flushing has elapsed, THEN **CLOSE** V5141, SAMPLE SINK 1D SAMPLE ISOL.

6. **NOTE** sample date and time.

   Date: _____ Time: _____

NOTE

Waiting for 3 minutes to pipet sample after sample valve is closed provides time for fume hood ventilation system to remove noble gases, which reduces radiation exposure.

7. **WAIT** 3 minutes.

8. **REQUEST** RP to monitor for airborne particulate, iodine and noble gas activity in vicinity of chemistry technician.

9. Using pipet **ADD** 1.0 ml of sample from sample beaker to sample bottle containing 999 ml demineralized water.

10. **CAP** sample bottle.

11. **FLUSH** sample sink and sample bottle with demineralized water.

12. **CLOSE** V5145, SAMPLE SINK DMW ISOL.

13. **WIPE** sample bottle and **PLACE** bottle into sample tray.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 9 of 10)

4.4 Obtaining Diluted LPSI Pump Sample (continued)

NOTE

- V5127, 1D SAMPLE HX INLET FROM 1A LPSI PUMP DISCH ISOL is to be left OPEN for subsequent sampling and to minimize personnel radiation exposure.
- V5128, 1D SAMPLE HX OUTLET SAMPLE THROTTLE and V05017, 1D SAMPLE HX OUTLET SAMPLE ISOL, are CLOSED after sampling to provide two-valve isolation.

14. **PERFORM** the following valve lineup to secure LPSI sample:

Valve	Description	Required Position	Aligned By	IV*
V05017	1D SAMPLE HX OUTLET SAMPLE ISOL	CLOSED		
V5128	1D SAMPLE HX OUTLET SAMPLE THROTTLE	CLOSED		
V5141	SAMPLE SINK 1D SAMPLE ISOL	CLOSED	NA	
V5145	SAMPLE SINK DMW ISOL	CLOSED	NA	
V5150	PURGE TO FLASH TANK ISOL	CLOSED		
V5152	PURGE TO VCT ISOL	CLOSED		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

15. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 7, Section 4.3, Step 3, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H\U Tanks

16. **TRANSPORT** sample to lab.

4.5 Sample Isotopic Analysis

1. **TRANSFER** 16.0 ml sample into scintillation vial.

ATTACHMENT 7
Obtaining Unit 1 Post-Accident Diluted Containment Sump Sample
(Page 10 of 10)

4.5 Sample Isotopic Analysis (continued)

2. **PERFORM** gamma isotopic analysis of scintillation vial sample using 0.016 ml for counting volume per CY-SL-102-0103, Operation of Ortec Gamma Spectroscopy System.

3. WHEN report is printed, THEN **ENSURE** all information is correct.

4. As soon as possible, **PROVIDE** results to Recovery Manager (RM).

5. **RECORD** sample results in CDMS.

6. **PERFORM** other analysis as directed by Chemistry supervision.

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 1 of 9)

(Section 8.2, Commitment 1)

Procedure Use requirement in Attachment 8 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for obtaining Unit 2 diluted Containment Sump sample (Low Pressure Safety Injection (LPSI) pump sample) during recovery phase of accident in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Exposure to reactor coolant or containment sump samples should be minimized to keep dose as low as possible.
3. Sample temperatures should be less than 120°F.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.
2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 2 of 9)

2.2 Limitations (continued)

3. Operations shall have V6307, FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

4. Attachment 8, Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample may be used if either LPSI pump is running; however, running LPSI pump must be identified.

5. Attachment 6, Section 3.2 should be referred to for additional guidelines, considerations and recommendations.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** applicable portion of Primary Sample System is operational.

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **ENSURE** Radiation Protection has issued specific RWP.

7. **CONFIRM** Radiation Protection to provide RP coverage during recovery phase RCS sampling evolutions.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 3 of 9)

3.0 PREREQUISITES (continued)

8. **VERIFY** in-service LPSI pump is recirculating borated water through reactor core.

9. **VERIFY NO** other sample lines are lined up to recirculate or flush to VCT or Flash Tank.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 4 of 9)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 8, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 8, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose, including use of shielding.
- **COMMUNICATE** specific RWP requirements.

4.2 Lab Preparations

NOTE

One technique to obtain 999 ml demineralized water is to fill 1000 ml volumetric flask to calibrated mark, remove 1.0 ml, then add flask contents to 1 liter poly bottle.

1. **ADD** 999 ml of demineralized water to clean 1 liter poly bottle.
2. **PLACE** 1.0 ml pipet and sample bottle in sample tray.
3. **IDENTIFY** running LPSI pump.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 5 of 9)

4.3 Recirculating / Flushing LPSI Pump Sample Line

1. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5164	2D SAMPLE HX INLET FROM 2B LPSI PUMP DISCH ISOL	CLOSED	
V5161	2D SAMPLE HX INLET FROM SDC SUCTION ISOL	CLOSED	
V5127	2D SAMPLE HX INLET FROM 2A LPSI PUMP DISCH ISOL	CLOSED	
V5165	2D SMPL HX INLET FROM 2B HPSI/LPSI/CNTMT SPRAY PUMPS ISOL	CLOSED	
V5185	2D SMPL HX INLET FROM 2A HPSI/LPSI/CNTMT SPRAY PUMPS ISOL	CLOSED	
V5128	2D SAMPLE HX OUTLET SAMPLE THROTTLE	CLOSED	
V5141	SAMPLE SINK 2D SAMPLE HX OUTLET SAMPLE ISOL	CLOSED	

2. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN	

3. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	OPEN	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

4. IF sampling 2A LPSI Pump, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5127	2D SAMPLE HX INLET FROM 2A LPSI PUMP DISCH ISOL	OPEN	
V5164	2D SAMPLE HX INLET FROM 2B LPSI PUMP DISCH ISOL	CLOSED	

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 6 of 9)

4.3 Recirculating / Flushing LPSI Pump Sample Line (continued)

5. IF sampling 2B LPSI Pump, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5127	2D SAMPLE HX INLET FROM 2A LPSI PUMP DISCH ISOL	CLOSED	
V5164	2D SAMPLE HX INLET FROM 2B LPSI PUMP DISCH ISOL	OPEN	

NOTE

0.8 gpm is preferred flow rate.

CAUTION

- Dose rates will increase dramatically after LPSI sample flow has been established by opening V5128, 2D SAMPLE HX OUTLET SAMPLE THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

6. **THROTTLE OPEN** V5128, 2D SAMPLE HX OUTLET SAMPLE THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

7. **MOVE** to area with lower dose rates.

8. **REQUEST** RP to monitor sample room dose rates as necessary.

9. **REQUEST** RP to perform general area radiation surveys at designated flush location (VCT or Flash Tank) to monitor increase in dose rates.

10. **ALLOW** sample line to recirculate / flush for amount of time it takes for at least 8 gallons to recirculate / flush, e.g. 10 minutes at 0.8 gpm.

4.4 Obtaining Diluted LPSI Pump Sample

1. **ENSURE** sample tray from Attachment 8, Section 4.2 is taken to sample room.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 7 of 9)

4.4 Obtaining Diluted LPSI Pump Sample (continued)

2. **PLACE** sample beaker under V5141, SAMPLE SINK 2D SAMPLE HX OUTLET SAMPLE ISOL, and **PLACE** tygon tubing inside beaker.

3. **OPEN** V5145, SAMPLE SINK DWS ISOL, to begin rinsing the sink, which will reduce airborne radioactivity and minimize contamination.

4. Slowly **OPEN** V5141, SAMPLE SINK 2D SAMPLE HX OUTLET SAMPLE ISOL, to flush beaker.

5. WHEN 30 seconds of flushing has elapsed, THEN **CLOSE** V5141, SAMPLE SINK 2D SAMPLE HX OUTLET SAMPLE ISOL.

6. **NOTE** sample date and time.

   Date: _____ Time: _____

NOTE

Waiting for 3 minutes to pipet sample after sample valve is closed provides time for fume hood ventilation system to remove noble gases, which reduces radiation exposure.

7. **WAIT** 3 minutes.

8. **REQUEST** RP to monitor for airborne particulate, iodine and noble gas activity in vicinity of chemistry technician.

9. Using pipet **ADD** 1.0 ml of sample from sample beaker to sample bottle containing 999 ml demineralized water.

10. **CAP** sample bottle.

11. **FLUSH** sample sink and sample bottle with demineralized water.

12. **CLOSE** V5145, SAMPLE SINK DMW ISOL.

13. **WIPE** sample bottle and **PLACE** bottle into sample tray.

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 8 of 9)

4.4 Obtaining Diluted LPSI Pump Sample (continued)

14. **PERFORM** the following valve lineup to secure LPSI sample:

Valve	Description	Required Position	Aligned By	IV*
V5127	2D SAMPLE HX INLET FROM 2A LPSI PUMP DISCH ISOL	CLOSED		
V5164	2D SAMPLE HX INLET FROM 2B LPSI PUMP DISCH ISOL	CLOSED		
V5128	2D SAMPLE HX OUTLET SAMPLE THROTTLE	CLOSED		
V5145	SAMPLE SINK DWS ISOL	CLOSED	NA	
V5141	SAMPLE SINK 2D SAMPLE HX OUTLET SAMPLE ISOL	CLOSED	NA	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN		
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

15. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 8, Section 4.3, Step 3, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H/U Tanks

16. **TRANSPORT** sample to the lab.

4.5 Sample Isotopic Analysis

1. **TRANSFER** 16.0 ml sample into scintillation vial.

2. **PERFORM** gamma isotopic analysis of scintillation vial sample using 0.016 ml for counting volume per CY-SL-102-0103, Operation of Ortec Gamma Spectroscopy System.

3. WHEN report is printed, THEN **ENSURE** all information is correct.

4. As soon as possible, **PROVIDE** results to Recovery Manager (RM).

ATTACHMENT 8
Obtaining Unit 2 Post-Accident Diluted Containment Sump Sample
(Page 9 of 9)

4.5 Sample Isotopic Analysis (continued)

5. **RECORD** sample results in CDMS.

6. **PERFORM** other analysis as directed by Chemistry supervision.

Date / Time Lineup Secured _____/_____

Performed By:	_____	_____	_____
	Signature	Initials	Date
Reader if applicable:	_____	_____	_____
	Signature	Initials	Date
Verified By:	_____	_____	_____
	Signature	Initials	Date

Reviewed By: _____ / _____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 1 of 11)

Procedure Use requirement in Attachment 9 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for obtaining Unit 1 undiluted RCS sample from normal Primary Sample System during recovery phase of accident in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Exposure to reactor coolant or containment sump samples should be minimized to keep dose as low as possible.
3. Hot Leg sample line shall **NOT** have system pressure applied without Undiluted Sample Cask installed.
4. Sample temperatures should be less than 120°F.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 2 of 11)

2.2 Limitations (continued)

2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

3. Operations shall have V6307, 1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

4. If CIS has occurred, solenoid valves to sample RCS, V5200, 1A HOT LEG LOOP SAMPLE ISOL, and V5203, 1A HOT LEG LOOP SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

5. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1).

6. Attachment 6, Contingency Plan for Post-Accident High Activity Samples, should be used for additional guidelines, considerations and recommendations.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 3 of 11)

3.0 PREREQUISITES (continued)

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **ENSURE** Radiation Protection has issued specific RWP.

7. **CONFIRM** Radiation Protection to provide RP coverage during recovery phase RCS sampling evolutions.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 4 of 11)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 9, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 9, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose, including use of shielding.
- **COMMUNICATE** specific RWP requirements.

4.2 Preparations

1. **MOVE** Undiluted Sample Cask from Unit 2 PASS Room to Unit 1 Primary Sample Room.
2. **ENSURE** Undiluted Sample Cask flexible sample lines are long enough to reach inside Primary Sample Room fume hood, performing modifications if necessary.

4.3 Obtaining Undiluted RCS Hot Leg Sample

1. **CONNECT** Undiluted Sample Cask flexible sample lines to Hot Leg sample line quick disconnect ports as follows:
   - **A.** **ENSURE** V5203, 1A HOT LEG LOOP SAMPLE ISOL is CLOSED.
   - **B.** **OPEN** V5102, RC SAMPLE VESSEL ASSEMBLY INLET ISOL.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 5 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

1. **(continued)**

   C. **OPEN** V5138, SAMPLE SINK RC SAMPLE ISOL.

   D. **DISCONNECT** flexible sample line inlet and lower port plug, or gas sample bomb from Hot Leg sample line quick disconnects, whichever is connected.

   E. **CONNECT** Undiluted Sample Cask flexible sample lines to Hot Leg sample line quick disconnect ports.

   F. **CLOSE** V5138, SAMPLE SINK RC SAMPLE ISOL.

   G. **CLOSE** V5102, RC SAMPLE VESSEL ASSEMBLY INLET ISOL.

2. IF RCS Hot Leg sample is already lined up to VCT, THEN **PERFORM** the following:

   A. **OPEN** V5203, 1A HOT LEG LOOP SAMPLE ISOL.

   B. **GO TO** Attachment 9, Section 4.3, Step 8.

3. IF CIS has occurred, THEN **REQUEST** Control Room to override CIS signal and reset V5200, 1A HOT LEG LOOP SAMPLE ISOL, and V5203, 1A HOT LEG LOOP SAMPLE ISOL.

4. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5105	RC SAMPLE VESSEL ASSEMBLY OUTLET ISOL	CLOSED	
V5106	RC SAMPLE VESSEL ASSEMBLY BYPASS	CLOSED	
V05015	RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL	CLOSED	
V5107	RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE	CLOSED	
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	CLOSED	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	CLOSED	

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 6 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

5. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5150	PURGE TO FLASH TANK ISOL	CLOSED	
V5152	PURGE TO VCT ISOL	OPEN	

6. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5150	PURGE TO FLASH TANK ISOL	OPEN	
V5152	PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

7. **OPEN** the following valves in order listed, from sample room:

Valve	Description	Required Position	Aligned By
V5200	1A HOT LEG LOOP SAMPLE ISOL	OPEN	
V5203	1A HOT LEG LOOP SAMPLE ISOL	OPEN	
V5106	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	
V05015	RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL	OPEN	

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 7 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

NOTE

0.8 gpm is preferred flow rate.

CAUTION

- Dose rates will increase dramatically after RCS sample flow has been established by opening V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

8. **THROTTLE OPEN** V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

9. **OPEN** the following valves on Undiluted Sample Cask:

Valve	Description	Required Position	Aligned By
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	OPEN	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	OPEN	

10. Slowly **OPEN** V5105, RC SAMPLE VESSEL ASSEMBLY OUTLET ISOL.

11. **OPEN** V5102, RC SAMPLE VESSEL ASSEMBLY INLET ISOL.

12. **CLOSE** V5106, RC SAMPLE VESSEL ASSEMBLY BYPASS.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 8 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

NOTE

0.8 gpm is preferred flow rate.

13. **ADJUST** flow using V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

14. **MOVE** to area with lower dose rates.

15. **REQUEST** RP to monitor sample room dose rates as necessary.

16. **REQUEST** RP to perform general area radiation surveys at designated flush location of VCT or Flash Tank to monitor increase in dose rates.

17. **ALLOW** RCS to recirculate / flush for amount of time it takes for at least 12 gallons to recirculate / flush, e.g. 15 minutes at 0.8 gpm.

NOTE

This sample is only pressurized to VCT or Flash Tank pressure.

18. WHEN calculated time for 12 gallon recirculation has elapsed, THEN **CLOSE** the following valves in order listed:

Valve	Description	Required Position	Aligned By
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	CLOSED	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	CLOSED	

19. **NOTE** sample date and time.

Date: _____ Time: _____

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 9 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

NOTE

Rinsing sink will reduce airborne radioactivity and minimize contamination.

20. **OPEN** V5145, SAMPLE SINK DMW ISOL, to begin rinsing sink.

21. **CLOSE** V05015, RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL.

22. **OPEN** the following valves to allow system to depressurize:

Valve	Description	Required Position	Aligned By
V5106	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	
V5138	SAMPLE SINK RC SAMPLE ISOL	OPEN	

23. WHEN pressure is approximately zero on PI-5510, RCS HOT LEG SAMPLE VESSEL ASSEMBLY INLET PRESS, THEN **CLOSE** the following valves:

Valve	Description	Required Position	Aligned By
V5102	RC SAMPLE VESSEL ASSEMBLY INLET ISOL	CLOSED	
V5105	RC SAMPLE VESSEL ASSEMBLY OUTLET ISOL	CLOSED	
V5138	SAMPLE SINK RC SAMPLE ISOL	CLOSED	

24. Carefully **DISCONNECT** Undiluted Sample Cask from Hot Leg sample line quick disconnect ports.

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 10 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

25. **REPLACE** Undiluted Sample Cask at quick disconnect ports as follows:

    A. IF cask is replaced with sample bomb, THEN **CONNECT** sample bomb at upper and lower quick disconnect ports.

    B. IF cask is replaced with flexible sample inlet line, THEN **PERFORM** the following:

    (1) **CONNECT** flexible sample inlet line to upper quick disconnect port.

    (2) **CONNECT** plug to lower quick disconnect port.

26. **FLUSH** sample sink with demineralized water.

27. **CLOSE** V5145, SAMPLE SINK DMW ISOL.

28. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5200	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	NA	
V5203	1A HOT LEG LOOP SAMPLE ISOL	CLOSED	NA	
V5145	SAMPLE SINK DMW ISOL	CLOSED	NA	
V5138	SAMPLE SINK RC SAMPLE ISOL	CLOSED	NA	
V5150	PURGE TO FLASH TANK ISOL	CLOSED		
V5152	PURGE TO VCT ISOL	CLOSED		
V05015	RCS SAMPLE VESSEL ASSEMBLY MANUAL ISOL	OPEN		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

29. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 9, Section 4.3, Step 6, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	1A FLASH TANK INLET/H/U TANKS FROM LTDN/RX DRAIN PUMPS 3-WAY FCV (in field) FLASH TANK DIVERT VALVE (in Control Room)	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H\U Tanks

ATTACHMENT 9
Obtaining Unit 1 Post-Accident Undiluted RCS Sample from Normal Primary Sample System
(Page 11 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

30. **TRANSPORT** sample to assigned storage location.

Date / Time Lineup Secured _____/_____

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ /_____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 1 of 11)

Procedure Use requirement in Attachment 10 is: CONTINUOUS USE

1.0 PURPOSE

To provide instructions for obtaining Unit 2 undiluted RCS sample from normal Primary Sample System during recovery phase of accident in conjunction with Attachment 6, Contingency Plan for Post-Accident High Activity Samples.

2.0 PRECAUTIONS / LIMITATIONS

2.1 Precautions

1. Reader-Doer team should be used to minimize time and radiation exposure. This process includes:
   - Reader reads step, using circle / slash method for tracking.
   - Reader and Doer shall use 3-part communication.
   - Doer performs step.
   - Reader observes and uses circle / slash for step completion.
2. Exposure to reactor coolant or containment sump samples should be minimized to keep dose as low as possible.
3. Hot Leg sample line shall **NOT** have system pressure applied without Undiluted Sample Cask installed.
4. Sample temperatures should be less than 120°F.

2.2 Limitations

1. It is preferable to recirculate or flush samples back to VCT. Flash Tank is second choice. Flow path shall be determined and discussed during pre-job brief.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 2 of 11)

2.2 Limitations (continued)

2. Control Room shall be notified prior to recirculating or flushing samples to Flash Tank.

3. Operations shall have V6307, FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV, aligned to Flash Tank when recirculating to Flash Tank.

4. If CIS has occurred, solenoid valves to sample RCS, V5200, RCS HOT LEG SAMPLE ISOL, and V5203, RCS HOT LEG SAMPLE ISOL, can **NOT** be opened until Control Room overrides CIS signal and valves are reset.

5. Hot Leg sample line solenoid valves should be closed after sampling. (Section 8.1.3, Management Directive 1).

6. Attachment 6, Contingency Plan for Post-Accident High Activity Samples, should be used for additional guidelines, considerations and recommendations.

3.0 PREREQUISITES

NOTE

It may be necessary to move counting equipment to low background area suitable for operation.

1. **ENSURE** count room detectors are operational for sample isotopic analysis.

2. **VERIFY** all Chemistry personnel that work from OSC for sampling during reentry to plant are respirator and SCBA qualified.

3. **VERIFY** Component Cooling Water (CCW) is in operation and supplying cooling water to sample heat exchangers.

4. **VERIFY** normal Primary Sample System is operational.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 3 of 11)

3.0 PREREQUISITES (continued)

NOTE

Unacceptable levels of noble gases will be present in sample sink and adjacent area if fume hood ventilation is **NOT** operable.

5. **ENSURE** Primary Sample Fume Hood ventilation is operational.

6. **ENSURE** Radiation Protection has issued specific RWP.

7. **CONFIRM** Radiation Protection to provide RP coverage during recovery phase RCS sampling evolutions.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 4 of 11)

4.0 INSTRUCTIONS

4.1 Pre Job Brief

- **COMMUNICATE** task objective.
- **CONFER** with Radiation Protection (RP) for radiological controls required for task.
- **COMMUNICATE** Chemistry personnel responsibilities.
- **ENSURE** Attachment 10, Section 3.0, PREREQUISITES are complete. _____
- **ENSURE** Attachment 10, Section 2.0, PRECAUTIONS / LIMITATIONS has been reviewed. _____
- **COMMUNICATE** methods for minimizing radiation dose, including use of shielding.
- **COMMUNICATE** specific RWP requirements.

4.2 Preparations

1. **MOVE** Undiluted Sample Cask from Unit 2 PASS Room to Unit 2 Primary Sample Room.
2. **ENSURE** Undiluted Sample Cask flexible sample lines are long enough to reach inside Primary Sample Room fume hood, performing modifications if necessary.

4.3 Obtaining Undiluted RCS Hot Leg Sample

1. **CONNECT** Undiluted Sample Cask flexible sample lines to Hot Leg sample line quick disconnect fittings as follows:
   - A. **ENSURE** V5203, RCS HOT LEG SAMPLE ISOL is CLOSED.
   - B. **OPEN** V5303, RC SAMPLE VESSEL ASSEMBLY INLET.
   - C. **OPEN** V5138, SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 5 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

1. **(continued)**

   D. **DISCONNECT** flexible sample line inlet and lower port plug, or gas sample bomb from Hot Leg sample line quick disconnects, whichever is connected.

   E. **CONNECT** Undiluted Sample Cask flexible sample lines to Hot Leg sample line quick disconnect ports.

   F. **CLOSE** V5138, SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL.

   G. **CLOSE** V5303, RC SAMPLE VESSEL ASSEMBLY INLET.

2. IF RCS Hot Leg sample is already lined up to VCT, THEN **PERFORM** the following:

   A. **OPEN** V5203, RCS HOT LEG SAMPLE ISOL.

   B. **GO TO** Attachment 10, Section 4.3, Step 8.

3. IF CIS has occurred, THEN **REQUEST** Control Room to override CIS signal and reset V5200, RCS HOT LEG SAMPLE ISOL, and V5203, RCS HOT LEG SAMPLE ISOL.

4. **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5305	RC SAMPLE VESSEL ASSEMBLY OUTLET	CLOSED	
V5304	RC SAMPLE VESSEL ASSEMBLY BYPASS	CLOSED	
V5107	RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE	CLOSED	
V05311	SAMPLE HEAT EXCHANGER 2A & 2B CROSS TIE	CLOSED	
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED	
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED	
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	CLOSED	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	CLOSED	

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 6 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

5. IF recirculating / flushing to VCT, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN	

6. IF recirculating / flushing to Flash Tank, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to Flash Tank	(Chemistry*)
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	OPEN	
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	CLOSED	

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to Flash Tank

NOTE

V5200, RCS HOT LEG SAMPLE ISOL, may **NOT** open or indicate open until V5203, RCS HOT LEG SAMPLE ISOL, is opened.

7. **OPEN** the following valves:

Valve	Description	Required Position	Aligned By
V5203	RCS HOT LEG SAMPLE ISOL	OPEN	
V5200	RCS HOT LEG SAMPLE ISOL	OPEN	
V5304	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 7 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

CAUTION

- Dose rates will increase dramatically after RCS sample flow has been established by opening V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE.
- 50 psig on PI-5550, SAMPLE PURGE HDR PRESS, is maximum pressure allowed when throttling flow.

8. **THROTTLE OPEN** V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

9. **OPEN** the following valves on Undiluted Sample Cask:

Valve	Description	Required Position	Aligned By
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	OPEN	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	OPEN	

10. Slowly **OPEN** V5305, RC SAMPLE VESSEL ASSEMBLY OUTLET.

11. **OPEN** V5303, RC SAMPLE VESSEL ASSEMBLY INLET.

12. **CLOSE** V5304, RC SAMPLE VESSEL ASSEMBLY BYPASS.

NOTE

0.8 gpm is preferred flow rate.

13. **ADJUST** flow using V5107, RC SAMPLE VESSEL ASSEMBLY OUTLET THROTTLE, to establish flow rate at 0.4 to 1.0 gpm as indicated on FI-5550, PURGE / SAMPLE TO VCT OR FLASH TANK FLOW.

14. **MOVE** to area with lower dose rates.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 8 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

15. **REQUEST** RP to monitor sample room dose rates as necessary.

16. **REQUEST** RP to perform general area radiation surveys at designated flush location of VCT or Flash Tank to monitor increase in dose rates.

17. **ALLOW** RCS to recirculate / flush for amount of time it takes for at least 12 gallons to recirculate / flush, e.g. 15 minutes at 0.8 gpm.

NOTE

This sample is only pressurized to VCT or Flash Tank pressure.

18. WHEN calculated time for 12 gallon recirculation has elapsed, THEN **CLOSE** the following valves in order listed:

Valve	Description	Required Position	Aligned By
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED	
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED	
V5778 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL INLET ISOL	CLOSED	
V5779 (on cart)	GRAB SMPL FACIL UNDIL DEPRESSURIZED LIQ SMPL VESSEL OUTLET ISOL	CLOSED	

19. **NOTE** sample date and time.

Date: _____ Time: _____

NOTE

Rinsing sink will reduce airborne radioactivity and minimize contamination.

20. **OPEN** V5145, SAMPLE SINK DWS ISOL, to begin rinsing sink.

21. **OPEN** the following valves to allow system to depressurize:

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 9 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

21. (continued)

Valve	Description	Required Position	Aligned By
V5304	RC SAMPLE VESSEL ASSEMBLY BYPASS	OPEN	
V5138	SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL	OPEN	

22. WHEN pressure is approximately zero on PI-5510, RCS HOT LEG SAMPLE VESSEL ASSEMBLY INLET PRESS, THEN **CLOSE** the following valves:

Valve	Description	Required Position	Aligned By
V5303	RC SAMPLE VESSEL ASSEMBLY INLET	CLOSED	
V5305	RC SAMPLE VESSEL ASSEMBLY OUTLET	CLOSED	
V5138	SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL	CLOSED	

23. Carefully **DISCONNECT** Undiluted Sample Cask from Hot Leg sample line quick disconnect ports.

24. **REPLACE** Undiluted Sample Cask at quick disconnect ports as follows:

A. IF cask is replaced with sample bomb, THEN **CONNECT** sample bomb at upper quick disconnect port V5103, RC SAMPLE VESSEL INLET ISOL and lower quick disconnect port V5104, RC SAMPLE VESSEL OUTLET ISOL.

B. IF cask is replaced with flexible sample inlet line, THEN **PERFORM** the following:

(1) **CONNECT** flexible sample inlet line to upper quick disconnect port.

(2) **CONNECT** plug to lower quick disconnect port.

25. **FLUSH** sample sink with demineralized water.

26. **CLOSE** V5145, SAMPLE SINK DWS ISOL.

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 10 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

27. **PERFORM** the following valve lineup to secure RCS Hot Leg sample:

Valve	Description	Required Position	Aligned By	IV*
V5203	RCS HOT LEG SAMPLE ISOL	CLOSED	NA	
V5200	RCS HOT LEG SAMPLE ISOL	CLOSED	NA	
V5145	SAMPLE SINK DWS ISOL	CLOSED	NA	
V5138	SAMPLE SINK RC HOT LEG LOOP 2A SAMPLE ISOL	CLOSED	NA	
V5152	SAMPLE OUTLET HDR PURGE TO FLASH TANK ISOL	CLOSED		
V5150	SAMPLE OUTLET HDR PURGE TO VCT ISOL	OPEN		

* Per ADM-17.06, Independent Verification, SM or US may waive Independent Verification requirement if significant radiation exposure greater than 1000 mR/hr is involved.

28. IF **NO** further sampling is required AND Flash Tank was used for recirculating/flushing per Attachment 10, Section 4.3, Step 6, THEN **PERFORM** the following valve lineup:

Valve	Description	Required Position	Aligned By
V6307	FLASH TANK OR H/U TANKS INLET FROM LTDN/RX DRAIN PUMPS 3-WAY FCV	Ops has ALIGNED to H/U Tanks	(Chemistry*)

* Chemistry initial for alignment after confirming with Control Room that Ops aligned V6307 to H/U Tanks

29. **TRANSPORT** sample to assigned storage location.

Date / Time Lineup Secured _____/_____

ATTACHMENT 10
Obtaining Unit 2 Post-Accident Undiluted RCS Sample From Normal Primary Sample System
(Page 11 of 11)

4.3 Obtaining Undiluted RCS Hot Leg Sample (continued)

29. (continued)

Performed By: _____ _____ _____
Signature Initials Date

Reader if applicable: _____ _____ _____
Signature Initials Date

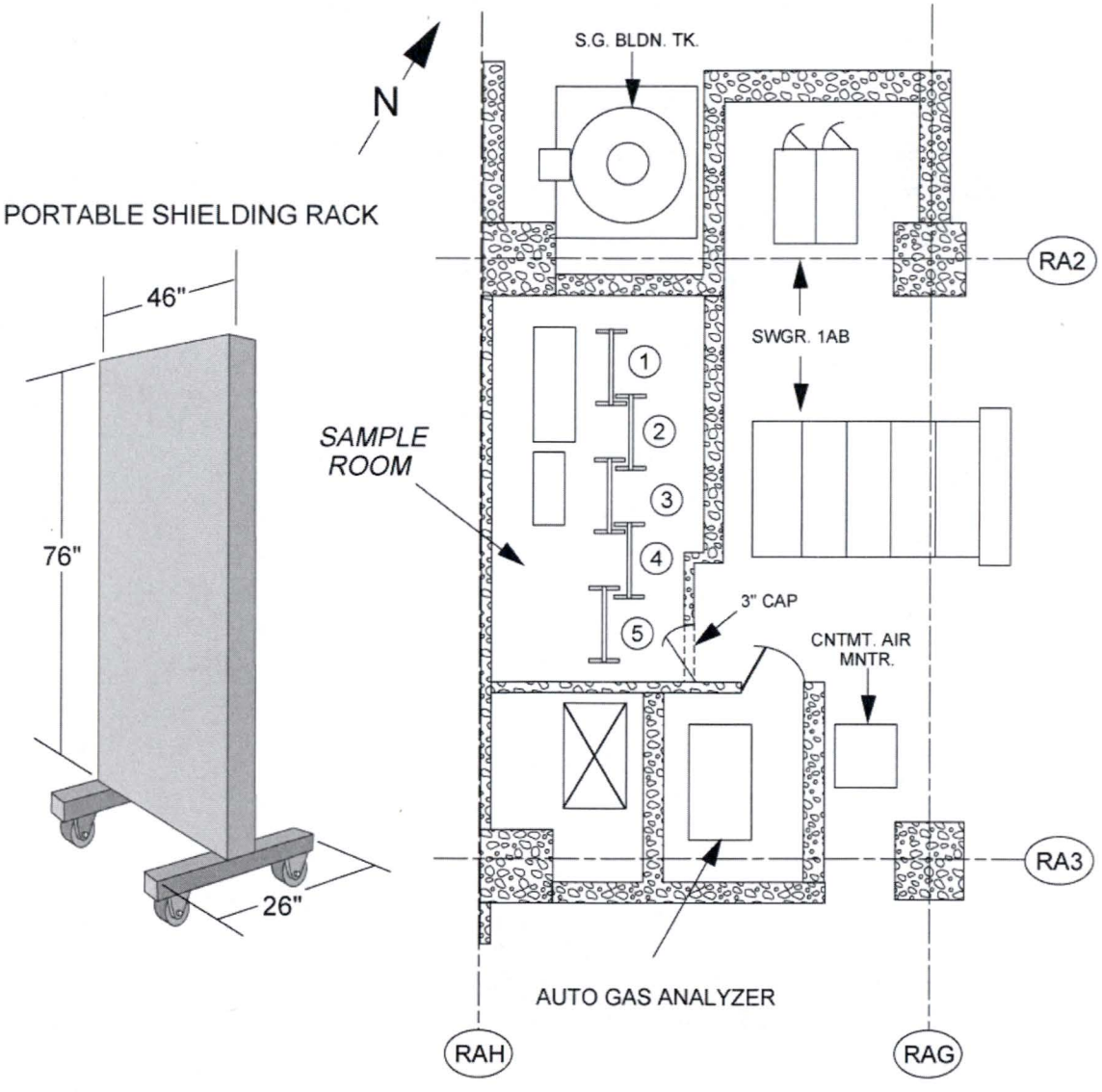
Verified By: _____ _____ _____
Signature Initials Date

Reviewed By: _____ _____
OSC Chemistry Supervisor (Signature) Date/Time

ATTACHMENT 11
Shielding Layout
(Page 1 of 2)

Procedure Use requirement in Attachment 11 is: REFERENCE USE

UNIT #1

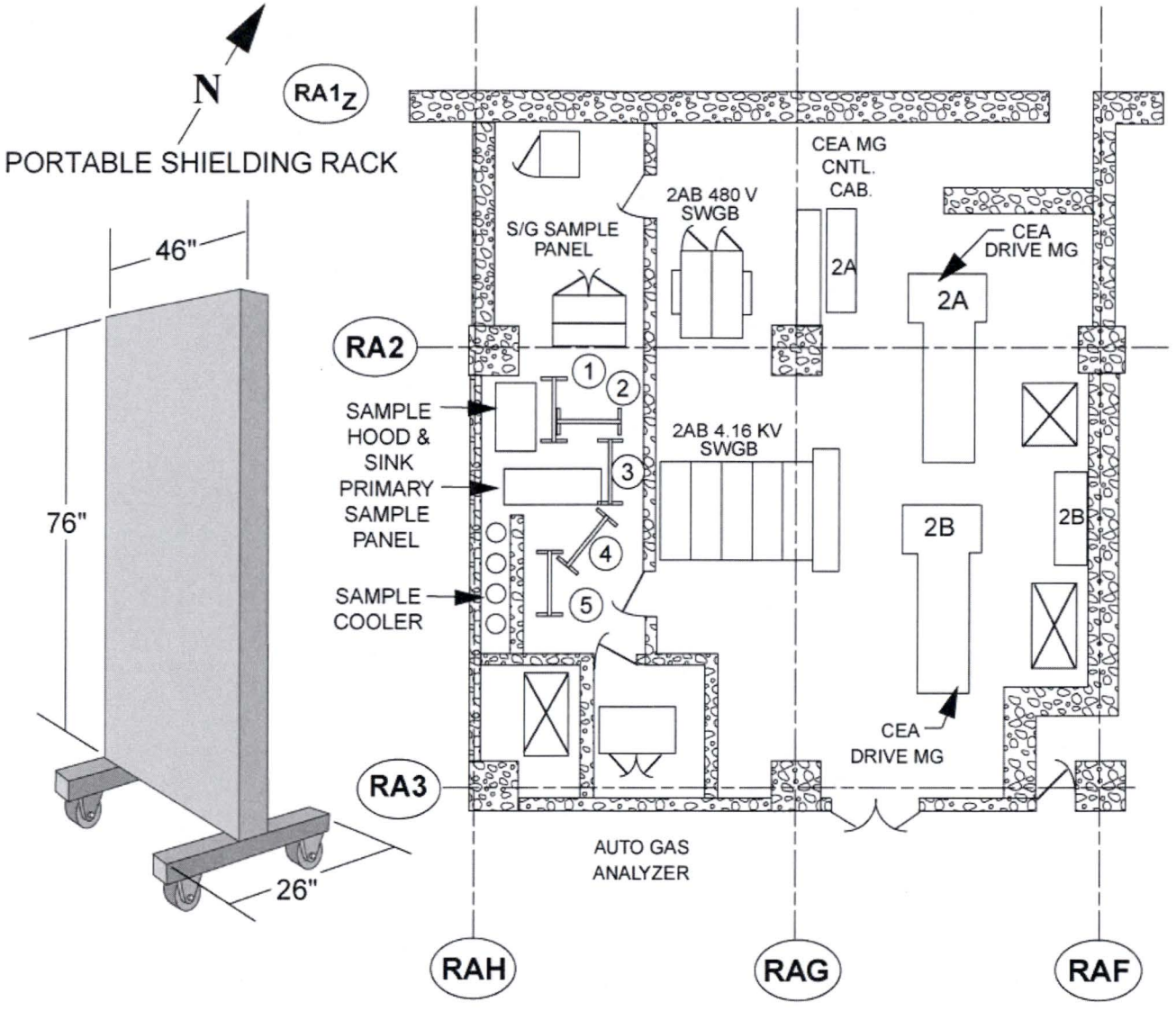


P:\PI\Graphics Temp Folder\Chem\CY-SL-108-0004 Att 11-1.PNG

NOTE:
1. RACKS SHOULD BE INSTALLED STARTING AT SAMPLE SINK
2. THERE IS A 3" INCH CAP AT THE ENTRANCE TO SAMPLE ROOM. SHIELDING MAY NEED TO BE ADDED TO RACKS INSIDE SAMPLE ROOM.

ATTACHMENT 11
Shielding Layout
(Page 2 of 2)

UNIT #2



PUP/Graphics Temp Folder/Chem/CY-SL-108-0004 Att 11-2.PNG

NOTE:
1. RACKS SHOULD BE INSTALLED STARTING AT SAMPLE SINK (TO FIT THRU NARROW SPACE AT SPACE AT VALVE PANEL)
2. THERE IS A 3" INCH CAP AT THE ENTRANCE TO SAMPLE ROOM. SHIELDING MAY NEED TO BE ADDED TO RACKS INSIDE SAMPLE ROOM.

ATTACHMENT 12
Emergency Preparedness Sampling Supply Checklist
(Page 1 of 2)

NOTE

In accordance with EP-AA-100-1001, Chemistry shall inspect, inventory, and operationally check all emergency equipment once per quarter. If emergency equipment has been removed or is degraded, it shall be replaced.

1. **ENSURE** the following inventory items are readily available for use and do not indicate degradation:

   A.
   - ☐ 1/4 inch tubing with a 3/8 and 1/4 inch Swagelok female quick connect fitting on each end
   - ☐ 1/4 inch tubing with a 3/8 and 1/4 inch Swagelok female quick connect fittings on each end with tubing connections for glass sphere placement
   - ☐ 3/8 inch tubing with a 1/4 inch nut and ferrule set on one end
   - ☐ 3/8 inch tubing connector with 1/4 inch nut and ferrule set on each end

   OR

   - ☐ Swagelok female quick connect with 3/8 inch port (3)
   - ☐ Swagelok female quick connect with a ¼ inch port (2)
   - ☐ 3/8 inch tubing
   - ☐ 1/4 inch tubing
   - ☐ 3/8 inch Swagelok nut, front and back ferrule set (7)
   - ☐ 1/4 inch Swagelok nut, front and back ferrule set (7)
   - ☐ 1/4 inch Swagelok stainless steel hose connector with 1/4 inch tube adaptor (4)
   - ☐ Hose clamp (6)

ATTACHMENT 12
Emergency Preparedness Sampling Supply Checklist
(Page 2 of 2)

1. (continued)

B.
- ☐ Swagelok stainless steel tee (2)
- ☐ Septa for Swagelok tee, 12.7 mm (25)
- ☐ Swagelok stainless steel VCR gaskets (5)
- ☐ Graduated gas syringe, 1-5 cc (2)
- ☐ Side port, tapered Luer needles (2)
- ☐ 30cc gas sphere with septa (2)
- ☐ Rubber septa for gas sphere (5)
- ☐ Emergency gas sampling tray

2. IF any of the emergency preparedness supplies are degraded or missing, THEN notify budget analyst of supplies that need to be replaced.

Budget Analyst Notified: _____ _____
Date

Completed By: _____ _____
Date

Reviewed By: _____ _____
Date