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PROGRESS ENERGY

CRYSTAL RIVER UNIT 3

PLANT OPERATING MANUAL

CH-632

Post Accident Sampling and Analysis of Reactor Coolant, Decay Heat, and Reactor Building Sump

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(Cont'd.)

ENCLOSURES

1.0 PURPOSE

This procedure provides instructions for sampling RCS, DH, and RB sump during accident conditions using PASS.

2.0 REFERENCES

2.1 Developmental References

2.1.1 APEX Technologies Post Accident Sample System Modules Manual, FPC Manual #2034

2.1.2 EOP-14, Enclosure 2, PPO Post Event Actions

2.1.3 FD-302-700, Post Accident Sampling System

2.1.4 Nuclear Regulatory Commission RTM-96, Response Technical Manual

2.1.5 NUREG 0737, Post-TMI Requirements

2.1.6 PASS Users Manual Volumes A through C, Crystal River Installation

2.1.7 Radiological Emergency Response Plan

2.1.8 Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors. July 2000

2.1.9 Regulatory Guide 1.97, Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident

2.1.10 RSP-600, ALARA Program

2.1.11 EM-104, Operation of the Operational Support Center

2.1.12 CH-234, Post Accident Sampling System Gamma Spectroscopy System

2.1.13 6059-S-002, APEX Technologies PASS Process Flow Diagrams

2.1.14 NUREG 1465, Accident Source Terms for Light-Water Nuclear Power Plants, Feb. 1995

2.1.15 License amendment # 213

2.2 Equipment Database References

CAV-126	CAV-440	CAV-493	CAV-636	CA-74-FI
DWV-337	CAV-441	CAV-500	CAV-702	CA-89-PI
CAV-429	CAV-442	CAV-514	CAV-703	CA-94-PI
CAV-430	CAV-445	CAV-517	CAV-704	CAX-1
CAV-431	CAV-446	CAV-519	CAV-705	AHF-55
CAV-432	CAV-447	CAV-546	CA-50-FS	CASB-5
CAV-433	CAV-448	CAV-549	CA-51-TE	CAP-8
CAV-434	CAV-470	CAV-623	CA-54-CE	CAP-10
CAV-435	CAV-471	CAV-624	CA-54-XC	CAP-14
CAV-436	CAV-484	CAV-625	CA-54-TE-1	CAT-8
CAV-437	CAV-491	CAV-626	CA-54-LT	DPDP-5A
CAV-439	CAV-492	CAV-627	CA-56-CI	DPDP-5B

3.0 PERSONNEL INDOCTRINATION

3.1 Description

3.1.1 PASS is an on-line system designed to sample various liquid and gaseous sample streams during accident conditions.

3.1.2 The liquid PASS system consists of an AIMS detector to perform gamma isotopic analysis of the sample streams.

3.1.3 The PASS system provides the ability to obtain liquid grab samples to be shipped off-site for analysis. [NOCS 100440, 100441]

3.1.4 The PASS system has the ability to analyze boron and gamma isotopic from RCS at high pressure. This sample may be obtained from RC letdown, RCP-1A discharge, or RCP-1C suction. [NOCS 100440, 100441]

3.1.5 The PASS system has the ability to analyze boron and gamma isotopic on low pressure systems. These systems include DH and RB sump. [NOCS 100440, 100441]

3.1.6 When estimating total activity for liquid grab sample shipment, the following assumptions were made:

- Core Nuclide Mix and Half-lives from RADTRAD Code Library
- 8 hours since reactor shutdown
- Microshield software was used to determine conversion factors for calculating total µCi from dose rate. Sample assumed to be small enough at 7 inches to represent point source. Pig is 17.75 inches tall with diameter of 7 inches. Weight is 725 pounds. This results in effective density of 7.4 g/cc.
- Release fractions from Regulatory Guide 1.183 for gap and early in-vessel melt
- Assume no noble gas remain in unpressurized RCS/sump sample

3.1.7 When estimating core damage based on RCS sample (Enclosure 5), the following assumptions were made:

- Factor (B) is 1300 based on the following:

  Assumed dilution mass = 1.3E9 grams
  1300 = (1.3E9 grams) x (1E-6 Ci/µCi)

- Core Inventory (D) is from RADTRAD library for 2619 MWth core
- Expected fraction in gap (F) is from NUREG 1465
- Expected in-vessel melt release fraction 100% melt (G) is from NUREG-1465

3.2 **Definitions**

3.2.1	AIMS	Automated Isotopic Measurement System
3.2.2	EC	Emergency Coordinator
3.2.3	PASS	Post Accident Sampling System
3.2.4	RE-ENTRY	Return of personnel to an area evacuated by an emergency condition
3.2.5	RMT	Radiation Monitoring Team
3.2.6	TMI	Three Mile Island nuclear power plant
3.2.7	IRP	Instrument Relay Panel

3.3 **Responsibilities**

3.3.1 EC or designee shall authorize re-entry.

3.3.2 OSC Chemistry Coordinator

- Ensures EC approval for re-entry has been obtained
- Determines which sections of procedure are to be performed during re-entry
- Ensures re-entry prerequisites are complete

3.3.3 This procedure is performed by a qualified Emergency Sample Team member.

3.4 **Limits and Precautions**

3.4.1 Any or all of this procedure is done by direction of the EC or designee.

3.4.2 Re-entry must have RMT preplanning, concurrence, and coverage as outlined in EM-104, Operation of the Operational Support Center. Controlled access areas will be defined by the RMT personnel.

3.4.3 Extremely high radiation dose rates may be present during post-accident sampling. These high dose rates could result in high radiation exposure. Performing this procedure requires ALARA pre-planning.

3.4.4 Emergency Sample Team will STOP and go to a low dose area (i.e. primary chemistry laboratory) if dose rates at re-entry work area exceeds limits specified in pre-job briefing.

3.4.5 All sampling actions are performed from the Main Control Board by Operations or from the Count Room unless specifically noted.

3.4.6 CAT-8 HI-HI level has the following interlocks:

- CAV-623 closes
- CAV-627 closes
- CAP-10 stops

3.4.7 Pressure > 175 psig at CA-89-PI may cause relief valves CAV-702 or CAV-491 to open. These relief valves open at approximately 200 psig.

3.4.8 Pressure > 30 psig at CA-94-PI may cause relief valve CAV-705 to open. This relief valve opens at approximately 50 psig.

3.4.9 Relief valves CAV-702, CAV-705, and CAV-491 discharge to the MWST. Lifting these relief valves may cause increased dose rates in the AB.

3.4.10 Sample is flushed through the boronometer at least 2 hours before obtaining boron results.

3.4.11 Sampling described in Section 4.0 of this procedure CANNOT be performed concurrently due to shared piping in the different sample streams.

3.4.12 Sampling any of the low pressure systems for the first time requires an entry into the PASS room (95' AB) to reposition CAV-701 to PORT 2 which could result in high radiation exposure. CAV-701 is normally positioned to PORT 1. Once positioned to PORT 2, the valve will remain in that position to avoid re-entry into a potentially high dose area.

3.4.13 The RB sump ALTERNATE sample point returns water to the MWST which could result in increased radiation levels in the AB.

3.4.14 Using the RB sump ALTERNATE sample point requires an entry into 95' IB to open CAV-500 which could result in high radiation exposure. A second re-entry is required to close the valve when securing the line-up.

3.5 **Prerequisites**

NOTE
Prerequisite steps may be performed in an order.

3.5.1 ASSEMBLE sample team.

Sample Team Leader _____

Sample Team Members _____

_____

_____

3.5.2 DETERMINE sampling to be performed.

Section Number	**Description**
_____	_____
_____	_____
_____	_____
_____	_____

3.5.3 REVIEW procedures.

___ EM-104, Operation of Operational Support Center

- ___ Emergency Team Member duties per Section 4.0
- ___ Team Briefing/Re-entry checklist

___ Sections of this procedure being performed

3.5.4 IF grab sample to be performed via CASB-5,
THEN ENSURE the following:

[ ] Grab sampler currently installed

OR

[ ] Grab sampler NOT currently installed

- ___ New break-away type device available to attach transit cover and transit cover bolts to sampler
- ___ Replacement sample bomb (Catalog ID 1400513) available to install on grab sampler transit cart

3.5.5 ENSURE electrical breakers are closed.

[ ] Operations has performed EOP-14 Enclosure 2, PPO Post Event Actions

OR

[ ] Operations has NOT performed EOP-14 Enclosure 2, PPO Post Event Actions

1. ___ REQUEST Operations CLOSE the following breakers
   - DPDP-5A Breaker 27 (CAV-433, CAV-434, CAV-429, CAV-430).
   - DPDP-5B, Breaker 8 (CAV-432, CAV-435, CAV-436)
2. ___ Operations REPORTS breakers closed

3.5.6 IF sampling a low pressure system,

- DH
- RB sump

THEN DETERMINE position of CAV-701

[ ] Low pressure system has NOT been sampled using PASS. CAV-701 is positioned to PORT 1. An entry into the PASS room (95' AB) is required to position CAV-701 to PORT 2. If an entry is needed, CAV-701 is located in the PASS room (95' AB) inside CAX-1. CAX-1 is located on LEFT after entering PASS room. CAV-701 is located MIDDLE LEFT SIDE inside CAX-1 approximately head high.

OR

[ ] Low pressure system HAS been sampled using PASS. CAV-701 was positioned to PORT 2 at that time and left in that position

3.5.7 IF sampling RB sump using ALTERNATE sample path,
THEN DISCUSS the following:

___ RB sump water will be pumped to MWST. This action could cause increased radiation levels in AB

___ 2 entries into 95' IB will be required to OPEN and subsequently CLOSE CAV-500. Operating CAV-500 could result in increased dose exposure

___ CAV-500 is located inside IB approximately 15' from IB door (about 3' past OTSG sample valve manifold) on left about 7' above floor

3.5.8 PERFORM pre-job brief.

___ ENSURE RMT member is present for briefing

DISCUSS the following

___ access route

___ exit route

___ Communications

Radio channel to be used _____

phone number(s) _____

_____

_____

3.5.9 VERIFY ALL steps of this section are completed before sample team leaves OSC.

Section 3.5 Complete ____/____
Initial/Date

4.0 INSTRUCTIONS

4.1 Reactor Coolant Gamma Isotopic or Boron Analysis

4.1.1 VERIFY radio communication.

___ WHEN sample team exits OSC,
THEN VERIFY radio communication with OSC Chemistry Coordinator or designee

4.1.2 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. CLOSE the following valves
   - ___ CAV-439
   - ___ CAV-636
3. OPEN the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
4. POSITION the following valves
   - ___ CAV-623 to SAMPLE
   - ___ CAV-625 to SAMPLE
   - ___ CAV-626 to DRAIN TANK

4.1.3 REQUEST Operations OPEN containment isolation valves.

1. OPEN sample isolation valve
   [ ] CAV-126 (Reactor Coolant Letdown)

   OR

   [ ] CAV-429 (RCP-1A Discharge)

   OR

   [ ] CAV-430 (RCP-1C Suction)
2. OPEN PASS Containment isolation valve
   [ ] CAV-431 (normal AIMS supply)

   OR

   [ ] CAV-432 (alternate AIMS supply)
3. OPEN RB sump return isolation valves
   ___ CAV-436
   ___ CAV-434
4. ___ Operations REPORTS valves OPEN

4.1.4 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO
___ START CAP-14

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valves CAV-702 or CAV-491 to open. Flow from these valves is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Relief valves CAV-702, CAV-705, and CAV-491 discharge to the MWST. Flow downstream of these valves is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.1.5 ADJUST sample flow.

1. ___ THROTTLE CAV-484 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.
2. ___ DEPRESS CA-74-FI RESET button to zero flow totalizer. REFER to Enclosure 6.
3. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch

4.1.6 DETERMINE status of RC letdown flow from Operations.

[ ] RC letdown flow secured

OR

[ ] RC letdown flow lined up

NOTE

Steps 4.1.8 and 4.1.9 may be performed while flushing sample.

4.1.7 FLUSH sample lines. Total flush volume is indicated using CA-74-FI totalizer reading. REFER to Enclosure 6.

[ ] CAV-126 open (RC Letdown secured) – FLUSH at least 45 gallons

OR

[ ] CAV-126 open (RC letdown lined up) – FLUSH at least 17.5 gallons

OR

[ ] CAV-429 open (RCP-1A discharge) – FLUSH at least 3 gallons

OR

[ ] CAV-430 open (RCP-1C suction) – FLUSH at least 3 gallons

4.1.8 ENSURE the following temperatures are maintained. REFER to Enclosure 2.

___ CA-54 TE-1 RCS < 120 ºF

___ CA-51 TE WATER < 100 ºF

4.1.9 IF gamma isotopic analysis is to be performed,
THEN ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance

[ ] Liquid nitrogen dewar > 50 pounds

[ ] Detector voltage adjusted

[ ] QC requirements met

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

NOTE

Enclosure 5 may be used to evaluate % core damage

NOTE

Gamma isotopic and boron analysis may be performed concurrently.

4.1.10 IF gamma isotopic analysis is to be performed,
THEN PERFORM the following:

1. ___ VERIFY minimum sample flush volume complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT applicable sample point
   [ ] Reactor Coolant Letdown Sample

   OR

   [ ] RCP-1A Discharge Sample

   OR

   [ ] RCP-1C Suction Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

Boronometer readout normally updates once per 15 minutes.

4.1.11 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ VERIFY sample flushed through boronometer. Flush must meet most restrictive requirement of at least 2 hours or the minimum volume specified in Step 4.1.7.
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valves CAV-702 or CAV-491 to open. Flow from these valves is routed to the MWST, which could cause radiation levels to increase in the AB.

4.1.12 ALIGN for demineralized water flush.

1. NOTIFY Operations to CLOSE containment isolation valves
   a. CLOSE sample isolation valve
      [ ] CAV-126 (Reactor Coolant Letdown)

      OR

      [ ] CAV-429 (RCP-1A Discharge)

      OR

      [ ] CAV-430 (RCP-1C Suction)
   b. CLOSE PASS Containment isolation valve
      [ ] CAV-431 (normal AIMS supply)

      OR

      [ ] CAV-432 (alternate AIMS supply)
   c. ___ Operations REPORTS valves closed
2. OPEN the following demineralized water supply valves
   ___ DWV-337
   ___ CAV-470
3. ___ THROTTLE CAV-484 to obtain 0.35-0.50 gpm at CA-74-FI

4.1.13 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT RCS Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

4.1.14 SECURE line-up.

1. ___ STOP CAP-14
2. ___ SELECT CAP-10 control switch to OFF
3. CLOSE demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-470
4. CLOSE the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-484
   - ___ CAV-623
   - ___ CAV-625
   - ___ CAV-626
5. NOTIFY Operations to CLOSE the following valves
   - ___ CAV-436
   - ___ CAV-434

4.1.15 RESTORE normal configuration.

1. ___ OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

Section 4.1 Complete ___/___
Initial/Date

4.2 **Reactor Coolant Gamma Isotopic, Boron, or Grab Sample Via CASB-5 Liquid Grab Sampler**

4.2.1 WHEN sample team exits OSC.
THEN VERIFY radio communications with OSC Chemistry Coordinator or designee.

NOTE

CASB-5 exhaust fan (AHF-55) switch is located to the right of Intermediate Building door (across from RM-A7)

4.2.2 ESTABLISH ventilation for liquid grab sampling.

___ POSITION AHF-55 switch to ON

4.2.3 ENSURE liquid grab sampler, CASB-5, installed.

[ ] Liquid grab sampler already installed

OR

[ ] REFER to Enclosure 10 for liquid grab sampler installation instructions

4.2.4 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. CLOSE the following valves
   - ___ CAV-439
   - ___ CAV-636
3. OPEN the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
4. POSITION the following valves
   - ___ CAV-623 to SAMPLE
   - ___ CAV-625 to SAMPLE
   - ___ CAV-626 to DRAIN TANK

4.2.5 REQUEST Operations OPEN containment isolation valves.

1. OPEN sample isolation valve
   [ ] CAV-126 (Reactor Coolant Letdown)

   OR

   [ ] CAV-429 (RCP-1A Discharge)

   OR

   [ ] CAV-430 (RCP-1C Suction)
2. OPEN PASS Containment isolation valve
   [ ] CAV-431 (normal AIMS supply)

   OR

   [ ] CAV-432 (alternate AIMS supply)
3. OPEN RB sump return isolation valves
   ___ CAV-436
   ___ CAV-434
4. ___ Operations REPORTS valves OPEN

4.2.6 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO

___ START CAP-14

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valves CAV-702 or CAV-491 to open. Flow from these valves is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Relief valves CAV-702, CAV-705, and CAV-491 discharge to the MWST. Flow downstream of these valves is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.2.7 ADJUST sample flow.

1. ___ THROTTLE CAV-484 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.
2. ___ DEPRESS CA-74-FI RESET button to zero flow totalizer. REFER to Enclosure 6.
3. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch

4.2.8 DETERMINE status of RC letdown flow from Operations.

[ ] RC letdown flow secured

OR

[ ] RC letdown flow lined up

NOTE
Steps 4.2.10 and 4.2.11 may be performed while flushing sample.

4.2.9 FLUSH sample lines. Total flush volume is indicated using CA-74-FI totalizer reading. REFER to Enclosure 6.

[ ] CAV-126 open (RC Letdown secured) – FLUSH at least 45 gallons

OR

[ ] CAV-126 open (RC letdown lined up) – FLUSH at least 17.5 gallons

OR

[ ] CAV-429 open (RCP-1A discharge) – FLUSH at least 3 gallons

OR

[ ] CAV-430 open (RCP-1C suction) – FLUSH at least 3 gallons

4.2.10 ENSURE the following temperatures are maintained. REFER to Enclosure 2.

___ CA-54 TE-1 RCS < 120 ºF
___ CA-51 TE WATER < 100 ºF

4.2.11 ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance
- [ ] Liquid nitrogen dewar > 50 pounds
- [ ] Detector voltage adjusted
- [ ] QC requirements met

NOTE

Gamma isotopic analysis may be performed concurrently with liquid grab sampler flush.

4.2.12 VERIFY system for liquid grab sample

1. ___ ENSURE minimum sample flush complete. Total flush volume is indicated using CA-74-FI totalizer reading
2. ___ OPEN CAV-445
3. ___ OPEN CAV-446
4. ___ CLOSE CAV-447
5. ___ FLUSH at least 15 minutes.

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

4.2.13 PERFORM gamma isotopic analysis.

1. ___ VERIFY minimum sample flush volume complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT applicable sample point

   [ ] Reactor Coolant Letdown Sample

   OR

   [ ] RCP-1A Discharge Sample

   OR

   [ ] RCP-1C Suction Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

CAV-492 and CAV-493 are on the grab sampler.

4.2.14 ISOLATE grab sample.

1. ___ CLOSE CAV-492
2. ___ CLOSE CAV-493

_____
Grab sample Date/Time

NOTE

Boronometer readout normally updates once per 15 minutes.

4.2.15 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ VERIFY sample flushed through boronometer. Flush must meet most restrictive requirement of at least 2 hours or the minimum volume specified in Step 4.2.9
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

4.2.16 ALIGN for demineralized water flush.

1. NOTIFY Operations to CLOSE containment isolation valves
   a. CLOSE sample isolation valve

   [ ] CAV-126 (Reactor Coolant Letdown)

   OR

   [ ] CAV-429 (RCP-1A Discharge)

   OR

   [ ] CAV-430 (RCP-1C Suction)

   b. CLOSE PASS Containment isolation valve

   [ ] CAV-431 (normal AIMS supply)

   OR

   [ ] CAV-432 (alternate AIMS supply)

   c. ___ Operations REPORTS valves closed
2. OPEN the following demineralized water supply valves
   ___ DWV-337
   ___ CAV-470
3. ___ ADJUST CAV-484 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.

4.2.17 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT RCS Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

4.2.18 RESTORE system line-up.

1. ___ OPEN CAV-447
2. ___ CLOSE CAV-445
3. ___ CLOSE CAV-446
4. ___ FLUSH at least 1 minute
5. ___ STOP CAP-14
6. ___ SELECT CAP-10 control switch to OFF
7. CLOSE demineralized water isolation valves
   - ___ DWV-337
   - ___ CAV-470
8. CLOSE the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-484
   - ___ CAV-623
   - ___ CAV-625
   - ___ CAV-626
9. NOTIFY Operations to CLOSE the following valves
   - ___ CAV-436
   - ___ CAV-434

4.2.19 RESTORE normal configuration.

1. ___ OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

4.2.20 REMOVE Liquid Grab Sampler, CASB-5.

1. ___ REMOVE liquid grab sampler from sample station, REFER to Enclosure 10
2. ___ TRANSPORT liquid grab sampler to 95' TB Crane Well
3. ___ UNBOLT liquid grab sampler from cart using ¾" wrench or equivalent as determined by Chemistry Technician
4. ___ INSTALL transit cover over quick connects
5. ___ MEASURE dose rates from liquid grab sampler

Contact dose rate (side of pig) _____ mR/hr

Dose rate @ 3 feet _____ mR/hr

4.2.21 PREPARE for liquid grab sample shipment.

___ REFER to Enclosure 11 for off-site shipment and notifications

Section 4.2 Complete ____/____
Initial/Date

4.3 **Decay Heat System Gamma Isotopic or Boron Analysis**

4.3.1 VERIFY radio communication.

___ WHEN sample team exits OSC,
THEN VERIFY radio communication with OSC Chemistry Coordinator or designee

4.3.2 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. CLOSE the following valves
   - ___ CAV-439
   - ___ CAV-636
3. OPEN the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
4. POSITION the following valves
   - ___ CAV-623 to SAMPLE
   - ___ CAV-625 to SAMPLE
   - ___ CAV-626 to DRAIN TANK

4.3.3 REQUEST Operations OPEN containment isolation valves:

1. OPEN RB sump return isolation valves
   - ___ CAV-436
   - ___ CAV-434
2. ___ Operations REPORTS valves OPEN

4.3.4 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO
___ START CAP-14

4.3.5 ENSURE CAV-701 positioned to PORT 2. This determination was made during the pre-job briefing. If an entry is needed, CAV-701 is located in the PASS room (95' AB) inside CAX-1. CAX-1 is located on LEFT after entering PASS room. CAV-701 is located MIDDLE LEFT inside CAX-1 approximately head high.

4.3.6 OPEN DH system sample isolation valves.

[ ] Decay Heat Train "A"
   - ___ CAV-441
   - ___ CAV-440

OR

[ ] Decay Heat Train "B"
   - ___ CAV-442
   - ___ CAV-440

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.3.7 ADJUST sample flow.

1. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.
2. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch

NOTE

Step 4.3.9 may be perfromed while flushing sample.

4.3.8 FLUSH sample lines.

___ FLUSH at least 5 minutes

4.3.9 IF gamma isotopic analysis is to be performed,
THEN ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance

- [ ] Liquid nitrogen dewar > 50 pounds
- [ ] Detector voltage adjusted
- [ ] QC requirements met

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

NOTE

Enclosure 5 may be used to evaluate % core damage

NOTE

Gamma isotopic and boron analysis may be performed concurrently.

4.3.10 IF gamma isotopic analysis is to be performed,
THEN PERFORM the following:

1. ___ VERIFY minimum sample flush time complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT applicable sample point
   [ ] A-Decay Heat Train Sample
   OR
   [ ] B-Decay Heat Train Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

Boronometer readout normally updates once per 15 minutes.

4.3.11 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ ENSURE sample flushed through boronometer at least 2 hours
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

4.3.12 ALIGN for demineralized water flush.

1. CLOSE the following valves

   [ ] Decay Heat Train "A"
   - ___ CAV-441
   - ___ CAV-440

   OR

   [ ] Decay Heat Train "B"
   - ___ CAV-442
   - ___ CAV-440

2. OPEN the following demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-471
3. ___ START CAP-8
4. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm at CA-74-FI

4.3.13 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT Sump Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

4.3.14 SECURE line-up.

1. ___ STOP CAP-8
2. ___ STOP CAP-14
3. ___ SELECT CAP-10 control switch to OFF
4. CLOSE demineralized water isolation valves
   - ___ DWV-337
   - ___ CAV-471
5. CLOSE the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-623
   - ___ CAV-624
   - ___ CAV-625
   - ___ CAV-626
6. NOTIFY Operations to CLOSE the following valves
   - ___ CAV-436
   - ___ CAV-434

4.3.15 RESTORE normal configuration.

1. ___ OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

Section 4.3 Complete ____/____
Initial/Date

4.4 **RB Sump Gamma Isotopic and Boron Analysis**

4.4.1 VERIFY radio communication.

___ WHEN sample team exits OSC,
THEN VERIFY radio communication with OSC Chemistry Coordinator or designee

4.4.2 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. POSITION the following valves

   [ ] NORMAL RB Sump sample

   ___ OPEN CAV-448
   ___ CLOSE CAV-439
   ___ CLOSE CAV-636

   OR

   [ ] ALTERNATE RB Sump sample

   ___ CLOSE CAV-636
3. OPEN the following valves

   ___ OPEN CAV-519
   ___ OPEN CAV-447
4. POSITION the following valves

   ___ CAV-623 to SAMPLE
   ___ CAV-625 to SAMPLE
   ___ CAV-626 to DRAIN TANK

CAUTION

When sampling RB Sump ALTERNATE sample point, sample is pumped to the MWST which could result in increased radiation levels in the AB.

NOTE

Operating CAV-500 requires an entry to 95' IB

4.4.3 OPEN sample valves.

[ ] NORMAL RB Sump sample

1. REQUEST Operations OPEN containment isolation valves
   - ___ CAV-434
   - ___ CAV-436
2. ___ Operations REPORTS valves OPEN

OR

[ ] ALTERNATE RB Sump sample

___ OPEN CAV-500 (located inside 95' IB approximately 3' past OTSG sample valve manifold approximately 7' above floor)

4.4.4 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO

___ START CAP-14

4.4.5 ENSURE CAV-701 positioned to PORT 2. This determination was made during the pre-job briefing. If an entry is needed, CAV-701 is located in the PASS room (95' AB) inside CAX-1. CAX-1 is located on LEFT after entering PASS room. CAV-701 is located MIDDLE LEFT inside CAX-1 approximately head high.

4.4.6 PRIME CAP-8

1. OPEN demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-471
2. ___ START CAP-8
3. ___ THROTTLE CAV-624 to MAINTAIN 0.35–0.50 gpm on CA-74-FI.

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.4.7 REQUEST Operations OPEN containment isolation valves.

1. OPEN sample isolation valves:

   [ ] NORMAL RB Sump sample

   ___ CAV-433

   ___ CAV-435

   OR

   [ ] ALTERNATE RB Sump sample

   ___ CAV-434

   ___ CAV-436

2. ___ Operations REPORTS valves OPEN
3. ___ THROTTLE CAV-624 to MAINTAIN 0.35–0.50 gpm on CA-74-FI.

4.4.8 WHEN stable flow indicated at CA-74-FI,
THEN CLOSE CAP-8 priming water valves.

___ DWV-337

___ CAV-471

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.4.9 ADJUST sample flow.

1. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.
2. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch

NOTE

Step 4.4.11 may be performed while flushing sample.

4.4.10 FLUSH sample lines.

___ FLUSH at least 35 minutes

4.4.11 IF gamma isotopic analysis is to be performed,
THEN ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance

[ ] Liquid nitrogen dewar > 50 pounds
[ ] Detector voltage adjusted
[ ] QC requirements met

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

NOTE

Enclosure 5 may be used to evaluate % core damage.

NOTE

Gamma isotopic and boron analysis may be performed concurrently.

4.4.12 IF gamma isotopic analysis is to be performed,
THEN PERFORM the following:

1. ___ VERIFY minimum sample flush time complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT Reactor Building Sump Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

Boronometer readout normally updates once per 15 minutes.

4.4.13 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ ENSURE sample flushed through boronometer at least 2 hours
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

4.4.14 ALIGN for demineralized water flush.

1. OPEN demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-471
2. REQUEST Operations CLOSE sample isolation valves
   - [ ] NORMAL RB Sump sample
     - ___ CAV-433
     - ___ CAV-435

   OR

   - [ ] ALTERNATE RB Sump sample
     - ___ CAV-434
     - ___ CAV-436
3. ___ Operations REPORTS valves CLOSED
4. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm at CA-74-FI

4.4.15 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT Sump Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

NOTE
Operating CAV-500 requires an entry to 95' IB.

4.4.16 SECURE line-up.

1. ___ STOP CAP-8
2. ___ STOP CAP-14
3. ___ SELECT CAP-10 control switch to OFF
4. CLOSE demineralized water isolation valves
   - ___ DWV-337
   - ___ CAV-471
5. ENSURE CLOSED the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-623
   - ___ CAV-624
   - ___ CAV-625
   - ___ CAV-626
6. NOTIFY Operations to ENSURE CLOSED the following valves
   - ___ CAV-436
   - ___ CAV-434
7. ___ IF ALTERNATE RB Sump sample was obtained,
   THEN CLOSE CAV-500 (located inside 95' IB approximately 3' past OTSG sample valve manifold approximately 7' above floor)

4.4.17 RESTORE normal configuration.

1. ___ ENSURE OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

Section 4.4 Complete ____/____
Initial/Date

4.5 **Decay Heat Gamma Isotopic, Boron, or Grab Sample Via CASB-5 Liquid Grab Sampler**

4.5.1 WHEN sample team exits OSC.
THEN VERIFY radio communications with OSC Chemistry Coordinator or designee.

NOTE
CASB-5 exhaust fan (AHF-55) switch is located to the right of Intermediate Building door (across from RM-A7)

4.5.2 ESTABLISH ventilation for liquid grab sampling.

___ POSITION AHF-55 switch to ON

4.5.3 ENSURE liquid grab sampler, CASB-5, installed.

[ ] Liquid grab sampler already installed

OR

[ ] REFER to Enclosure 10 for liquid grab sampler installation instructions

4.5.4 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. CLOSE the following valves
   - ___ CAV-439
   - ___ CAV-636
3. OPEN the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
4. POSITION the following valves
   - ___ CAV-623 to SAMPLE
   - ___ CAV-625 to SAMPLE
   - ___ CAV-626 to DRAIN TANK

4.5.5 REQUEST Operations OPEN containment isolation valves.

1. OPEN RB Sump return isolation valves
   ___ CAV-436
   ___ CAV-434
2. ___ Operations REPORTS valves OPEN

4.5.6 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO
___ START CAP-14

4.5.7 ENSURE CAV-701 positioned to PORT 2. This determination was made during the pre-job briefing. If an entry is needed, CAV-701 is located in the PASS room (95' AB) inside CAX-1. CAX-1 is located on LEFT after entering PASS room. CAV-701 is located, MIDDLE LEFT inside CAX-1 approximately head high.

4.5.8 OPEN DH system sample isolation valves.

[ ] Decay Heat Train "A"
   ___ CAV-441
   ___ CAV-440

OR

[ ] Decay Heat Train "B"
   ___ CAV-442
   ___ CAV-440

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.5.9 ADJUST sample flow.

1. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm on CA-74-FI. DO NOT exceed 175 psig at CA-89-PI
2. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch

NOTE

Step 4.5.11 may be performed while sample flushing.

4.5.10 FLUSH sample lines.

___ FLUSH for at least 5 minutes.

4.5.11 ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance

[ ] Liquid nitrogen dewar > 50 pounds

[ ] Detector voltage adjusted

[ ] QC requirements met

NOTE

Gamma isotopic and boron analysis may be performed concurrently with liquid grab sampler flush.

4.5.12 ALIGN system for liquid grab sample

1. ___ ENSURE minimum sample flush time complete
2. ___ OPEN CAV-445
3. ___ OPEN CAV-446
4. ___ CLOSE CAV-447
5. ___ FLUSH at least 15 minutes.

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

4.5.13 PERFORM gamma isotopic analysis.

1. ___ VERIFY minimum sample flush time complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT applicable sample point

   [ ] A-Decay Heat Train Sample

   OR

   [ ] B-Decay Heat Train Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

CAV-492 and CAV-493 are on the grab sampler.

4.5.14 ISOLATE grab sample.

1. ___ CLOSE CAV-492
2. ___ CLOSE CAV-493

_____

Grab sample Date/Time

NOTE

Boronometer readout normally updates once per 15 minutes.

4.5.15 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ ENSURE sample flushed through boronometer at least 2 hours
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

4.5.16 ALIGN for demineralized water flush.

1. CLOSE sample isolation valves.

[ ] Decay Heat Train "A"
___ CAV-441
___ CAV-440

OR

[ ] Decay Heat Train "B"
___ CAV-442
___ CAV-440

2. OPEN the following demineralized water supply valves
___ DWV-337
___ CAV-471
3. ___ START CAP-8
4. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm on CA-74-FI

4.5.17 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT Sump Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

4.5.18 SECURE line-up.

1. ___ OPEN CAV-447
2. ___ CLOSE CAV-445
3. ___ CLOSE CAV-446
4. ___ FLUSH at least 1 minute
5. ___ STOP CAP-8
6. ___ STOP CAP-14
7. ___ SELECT CAP-10 control switch to OFF
8. CLOSE demineralized water isolation valves
   - ___ DWV-337
   - ___ CAV-471
9. CLOSE the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-623
   - ___ CAV-624
   - ___ CAV-625
   - ___ CAV-626
10. NOTIFY Operations to CLOSE the following valves
    - ___ CAV-436
    - ___ CAV-434

4.5.19 RESTORE normal configuration.

1. ___ ENSURE OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

4.5.20 REMOVE Liquid Grab Sampler, CASB-5.

1. ___ REMOVE liquid grab sampler from sample station, REFER to Enclosure 10
2. ___ TRANSPORT liquid grab sampler to 95' TB Crane Well
3. ___ UNBOLT liquid grab sampler from cart using ¾" wrench or equivalent as determined by Chemistry Technician
4. ___ INSTALL transit cover over quick connects
5. ___ MEASURE dose rates from liquid grab sampler

Contact dose rate (side of pig) _____ mR/hr

Dose rate @ 3 feet _____ mR/hr

4.5.21 PREPARE for liquid grab sample shipment.

___ REFER to Enclosure 11 for off-site shipment and notifications

Section 4.5 Complete ____/____
Initial/Date

4.6 **RB Sump Gamma Isotopic, Boron, or Grab Sample Via CASB-5 Liquid Grab Sampler**

4.6.1 WHEN sample team exits OSC.
THEN VERIFY radio communications with OSC Chemistry Coordinator or designee.

NOTE

CASB-5 exhaust fan (AHF-55) switch is located to the right of Intermediate Building door (across from RM-A7)

4.6.2 ESTABLISH ventilation for liquid grab sampling.

___ POSITION AHF-55 switch to ON

4.6.3 ENSURE liquid grab sampler, CASB-5, installed.

[ ] Liquid grab sampler already installed

OR

[ ] REFER to Enclosure 10 for liquid grab sampler installation instructions

4.6.4 ALIGN system for sample.

1. ___ SELECT CAP-10 control switch to OFF
2. POSITION the following valves
   [ ] NORMAL RB Sump sample
      ___ OPEN CAV-448
      ___ CLOSE CAV-439
      ___ CLOSE CAV-636

   OR

   [ ] ALTERNATE RB Sump sample
      ___ CLOSE CAV-636
3. OPEN the following valves:
   ___ OPEN CAV-519
   ___ OPEN CAV-447
4. POSITION the following valves:
   ___ CAV-623 to SAMPLE
   ___ CAV-625 to SAMPLE
   ___ CAV-626 to DRAIN TANK

CAUTION

When sampling RB Sump ALTERNATE sample point, sample is pumped to the MWST which could result in increased radiation levels in the AB.

NOTE

Operating CAV-500 requires an entry to 95' IB

4.6.5 OPEN sample valves.

[ ] NORMAL RB Sump sample

1. REQUEST Operations OPEN containment isolation valves
   - ___ CAV-434
   - ___ CAV-436
2. ___ Operations REPORTS valves OPEN

OR

[ ] ALTERNATE RB Sump sample

___ OPEN CAV-500 (located inside 95' IB approximately 3' past OTSG sample valve manifold approximately 7' above floor)

4.6.6 ALIGN CAT-8.

___ SELECT CAP-10 control switch to AUTO

___ START CAP-14

4.6.7 ENSURE CAV-701 positioned to PORT 2. This determination was made during the pre-job briefing. If an entry is needed, CAV-701 is located in the PASS room (95' AB) inside CAX-1. CAX-1 is located on LEFT after entering PASS room. CAV-701 is located MIDDLE LEFT inside CAX-1 approximately head high.

4.6.8 PRIME CAP-8

1. OPEN demineralized water supply valves:
   - ___ DWV-337
   - ___ CAV-471
2. ___ START CAP-8
3. ___ THROTTLE CAV-624 to MAINTAIN 0.35–0.50 gpm on CA-74-FI.

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.6.9 REQUEST Operations OPEN containment isolation valves.

1. OPEN sample isolation valves:

[ ] NORMAL RB Sump sample

___ CAV-433

___ CAV-435

OR

[ ] ALTERNATE RB Sump sample

___ CAV-434

___ CAV-436

2. ___ Operations REPORTS valves OPEN
3. ___ THROTTLE CAV-624 to MAINTAIN 0.35–0.50 gpm on CA-74-FI.

4.6.10 WHEN stable flow indicated at CA-74-FI,
THEN CLOSE CAP-8 priming water valves.

___ DWV-337

___ CAV-471

CAUTION

Exceeding 175 psig on CA-89-PI may cause relief valve CAV-491 to open. Flow from this valve is routed to the MWST, which could cause radiation levels to increase in the AB.

NOTE

Flow downstream of CAV-491 is indicated at CA-50-FS located on countroom mimic panel. The GREEN light indicates NO FLOW. The RED light indicates FLOW.

4.6.11 ADJUST sample flow.

1. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm at CA-74-FI. DO NOT exceed 175 psig at CA-89-PI.
2. ___ ENSURE NO FLOW indicated (GREEN light lit) at CA-50-FS flow switch.

NOTE

Step 4.6.13 may be performed while flushing sample.

4.6.12 FLUSH sample lines.

___ FLUSH at least 35 minutes

4.6.13 ENSURE PASS AIMS detector CA-54-CE ready for use.

___ REFER to Enclosure 3 for guidance

[ ] Liquid nitrogen dewar > 50 pounds
[ ] Detector voltage adjusted
[ ] QC requirements met

NOTE

Gamma isotopic and boron analysis may be performed concurrently with liquid grab sampler flush.

4.6.14 ALIGN system for liquid grab sample

1. ___ ENSURE minimum sample flush time complete
2. ___ OPEN CAV-445
3. ___ OPEN CAV-446
4. ___ CLOSE CAV-447
5. ___ FLUSH at least 15 minutes.

NOTE

The gamma isotopic analysis step may be repeated for multiple gamma analyses.

4.6.15 PERFORM gamma isotopic analysis.

1. ___ VERIFY minimum sample flush time complete
2. REFER to Enclosure 4 for gamma isotopic analysis
   ___ SELECT Reactor Building Sump Sample
3. ___ ATTACH gamma scan(s) to this procedure

Gamma Scan ID number(s)

_____

_____

_____

NOTE

CAV-492 and CAV-493 are located on the grab sampler

4.6.16 ISOLATE grab sample.

1. ___ CLOSE CAV-492
2. ___ CLOSE CAV-493

_____

Grab sample Date/Time

NOTE

Boronometer readout normally updates once per 15 minutes.

4.6.17 IF boron analysis is to be performed,
THEN PERFORM the following:

1. ___ ENSURE sample flushed through boronometer at least 2 hours
2. ___ OBSERVE boron concentration at CA-56-CI

Boron Concentration(s)

_____ ppm

_____ ppm

_____ ppm

4.6.18 ALIGN for demineralized water flush.

1. OPEN demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-471
2. REQUEST Operations CLOSE sample isolation valves
   - [ ] NORMAL RB Sump sample
     - ___ CAV-433
     - ___ CAV-435

   OR

   - [ ] ALTERNATE RB Sump sample
     - ___ CAV-434
     - ___ CAV-436
3. ___ Operations REPORTS valves CLOSED
4. ___ THROTTLE CAV-624 to MAINTAIN 0.35-0.50 gpm on CA-74-FI

4.6.19 ENSURE adequate system purge.

1. ___ ENSURE logged onto PASS computer
2. ___ ENSURE PASS Menu selected
3. ___ SELECT Flush Sample Lines
4. ___ SELECT Sump Demin Flush
5. ___ FLUSH at least 10 minutes
6. ___ PRESS ENTER when flush is complete
7. ___ SELECT Quit to exit
8. ___ ENTER LO to log off PASS

NOTE
CAV-500 is located in the Intermediate Building

4.6.20 RESTORE system line-up.

1. ___ OPEN CAV-447
2. ___ CLOSE CAV-445
3. ___ CLOSE CAV-446
4. ___ FLUSH at least 1 minute
5. ___ STOP CAP-8
6. ___ STOP CAP-14
7. ___ SELECT CAP-10 control switch to OFF
8. CLOSE demineralized water supply valves
   - ___ DWV-337
   - ___ CAV-471
9. ENSURE CLOSED the following valves
   - ___ CAV-519
   - ___ CAV-447
   - ___ CAV-448
   - ___ CAV-623
   - ___ CAV-624
   - ___ CAV-625
   - ___ CAV-626
10. NOTIFY Operations to ENSURE CLOSED the following valves:
    - ___ CAV-436
    - ___ CAV-434
11. ___ IF ALTERNATE RB Sump sample was obtained, THEN CLOSE CAV-500

4.6.21 RESTORE normal configuration.

1. ___ ENSURE OPEN CAV-439
2. ___ OPEN CAV-636
3. ___ SELECT CAP-10 control switch to AUTO

4.6.22 REMOVE Liquid Grab Sampler, CASB-5.

1. ___ REMOVE liquid grab sampler from sample station, REFER to Enclosure 10
2. ___ TRANSPORT liquid grab sampler to 95' TB Crane Well
3. ___ UNBOLT liquid grab sampler from cart using ¾" wrench or equivalent as determined by Chemistry Technician
4. ___ INSTALL transit cover over quick connects
5. ___ MEASURE dose rates from liquid grab sampler

Contact dose rate (side of pig) _____ mR/hr

Dose rate @ 3 feet _____ mR/hr

4.6.23 PREPARE for liquid grab sample shipment.

___ REFER to Enclosure 11 for off-site shipment and notifications

Section 4.6 Complete ____/____
Initial/Date

5.0 **CONTINGENCIES**

5.1 **Relief Valve Flow Indicated at CA-50-FS Flow Switch**

5.1.1 NOTIFY OSC Chemistry Coordinator, or designee

5.1.2 ENSURE CAV-484 adjusted to maintain the following parameters

- CA-89-PI < 175 psig
- CA-74-FI 0.35-0.50 gpm

5.1.3 IF relief valve(s) are lifting
AND CANNOT be re-seated,
THEN PERFORM the following:

[ ] OSC Chemistry Coordinator, or designee, approves continued system operation

___ CONTINUE with applicable section of this procedure

OR

[ ] PERFORM demineralized water flush and secure PASS per applicable section of this procedure.

____/____
Section 5.1 complete Initial/Date

5.2 **PASS Temperatures Greater Than Expected**

5.2.1 NOTIFY OSC Chemistry Coordinator or designee

5.2.2 REDUCE sample flow by throttling CAV-484. ENSURE CAV-484 adjusted to maintain the following parameters.

- CA-89-PI < 175 psig
- CA-74-FI 0.35-0.50 gpm

5.2.3 ENSURE relief valves NOT lifting. Flow downstream of relief valves is indicated by CA-50-FS RED light lit.

5.2.4 IF temperatures are greater than expected
AND CANNOT be adjusted to desired temperatures,
THEN PERFORM the following:

[ ] OSC Chemistry Coordinator, or designee, approves continued system operation.

___ CONTINUE with applicable section of this procedure

OR

[ ] PERFORM demineralized water flush and secure PASS per applicable section of this procedure.

____/____
Section 5.2 complete Initial/Date

5.3 **CAT-8 Hi-Hi Level Alarm**

5.3.1 ENSURE the following interlock functions occurred:

[ ] CAV-623 indicates CLOSED (green light lit)
[ ] CAV-627 indicates CLOSED (green light lit)
[ ] CAP-10 STOPPED (green light lit)

5.3.2 ENSURE the following control switches positioned as followed:

[ ] CAV-623 selected to CLOSE
[ ] CAV-627 selected to CLOSE
[ ] CAP-10 selected to OFF

5.3.3 PUMP CAT-8.

1. ___ DEPRESS and HOLD CAT-8 level RESET button
2. ___ START CAP-10 (control switch to ON position)
3. ___ CONTINUE depressing CAT-8 level RESET button until CAT-8 HI-HI and HI LEVEL alarms are clear

5.3.4 RESTORE system.

___ POSITION CAV-623 to SAMPLE (if valve was positioned to SAMPLE for section of procedure being performed)
___ POSITION CAV-627 to SAMPLE (if valve was positioned to SAMPLE for section of procedure being performed)
___ SELECT CAP-10 control switch to AUTO

5.3.5 CONTINUE procedure at applicable step.

____/____
Section 5.3 complete Initial/Date

5.4 **Estimating Grab Sample Shipment Curie Content When Gamma Spectroscopy System is Unavailable**

5.4.1 ESTIMATE curie content of grab sample.

___ REFER to Enclosure 12

____/____
Section 5.4 complete Initial/Date

5.5 **Manual Collimator Positioning and Manual Gamma Isotopic Analysis**

5.5.1 PURGE sample line.

___ ENSURE sample line flush complete per applicable gamma spectroscopy section of this procedure

5.5.2 PERFORM gamma isotopic analysis.

1. ___ POSITION collimator and near line valves manually per Enclosure 13.
2. ___ PERFORM gamma isotopic analysis manually per Enclosure 13.
3. ___ RECORD gamma ID number in applicable gamma isotopic analysis section and CONTINUE procedure at that point.

____/____
Section 5.5 complete Initial/Date

TECHNICAL SUPPORT CENTER DATA SHEET

Sample Point

[ ] RC Letdown
[ ] DH
[ ] RB Sump

Chemical Analyses

Boron _____ ppm

_____
Initials/Date/Time

Boron _____ ppm

_____
Initials/Date/Time

Boron _____ ppm

_____
Initials/Date/Time

Boron _____ ppm

_____
Initials/Date/Time

_____
OSC Chemistry Coordinator

TECHNICAL SUPPORT CENTER DATA SHEET

Sample Point

[ ] RC Letdown
[ ] DH
[ ] RB Sump

Gamma Isotopic Analysis

Major Contributing Isotopes

Isotope	Activity
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml
_____	_____ µCi/ml

Total Activity _____ µCi/ml

_____
Initials/Date/Time

ESTIMATE core damage per Enclosure 5.

_____
OSC Chemistry Coordinator

Guidelines for Monitoring PASS System Parameters

1. LOG ON to PASS
   [ ] LOG ON from CRCHEM
   ___ ENTER PASS. There is no password

   OR

   [ ] Log on from CHIP

   a. LOG ON to CHIP using personal username and password
   b. SELECT PASS (CRCHEM) from Main Menu
   c. ENTER username PASS. There is no password.

2. SELECT PASS menu

3. SELECT DISPLAY ND68DC INPUT VALUES

NOTE
The displayed parameters are not continuously updated. Pressing ENTER updates the displayed parameters with current values.

4. MONITOR the required parameters.

5. WHEN monitoring is complete,
   THEN ENTER Q to quit.

6. [ ] ENTER Y to obtain a hard copy of the parameters and return to PASS Main Menu

   OR

   [ ] ENTER N to return to PASS Main Menu

PASS AIMS Pre-Analysis Check Guidelines

1. VERIFY dewar weight > 50 as indicated at liquid nitrogen monitor CA-54-LT.

CAUTION

AIMS detector CA-54-CE HV supply potentiometer should be adjusted to 0 volts before resetting liquid nitrogen monitor CA-54-LT low level voltage trip or detector damage may occur.

2. ENSURE PASS HV supply voltage adjusted per PASS and RANGE AIMS Equipment Logbook.

CAUTION

Increasing detector voltage > 100 volts/second may cause detector damage.

3. IF PASS detector voltage is secured,
   THEN ADJUST detector voltage as follows:
   a. ENSURE CA-54-CE HV supply voltage potentiometer adjusted full *counterclockwise*
   b. DEPRESS liquid nitrogen monitor CA-54-LT HV RESET button.
   c. DEPRESS CA-54-CE HV supply voltage RESET button.
   d. ENSURE CA-54-CE HV supply power switch selected to ON position
   e. ADJUST CA-54-CE HV supply voltage per PASS and RANGE AIMS Equipment Logbook.
   f. LOCK CA-54-CE voltage potentiometer at correct voltage reading
4. ENSURE calibration check completed.

   - Calibration Check completed within past 7 days

   OR

   - PERFORM calibration check per CH-234, Post Accident Sampling System Gamma Spectroscopy System.

Guidelines for Performing Gamma Spectroscopy Analysis

1. LOG ON to PASS

   [ ] LOG ON PASS from CRCHEM
   ENTER username PASS. There is no password.

   OR

   [ ] LOG ON PASS from CHIP
   a. LOG ON to CHIP using personal username and password
   b. SELECT PASS (CRCHEM) from Main Menu
   c. ENTER username PASS. There is no password.

2. SELECT PASS menu
3. SELECT Liquid Sampling
4. SELECT sample point based on section of procedure being performed
5. IF system parameters are displayed (MUX display),
   THEN ENTER Q to quit
   AND ENTER N at prompt for aborting sample

NOTE
The default sample parameters are normally used. Sample time and volume are automatically updated by software. Specific parameters may be edited as needed on a case by case basis.

6. UPDATE sample parameters
7. SELECT ACCEPT

ASSESSMENT OF CORE DAMAGE BASED ON REACTOR COOLANT SAMPLE

Assumptions and Limitations

1. Use of RCS sample results to estimate the extent of core damage is subject to significant uncertainties. Many orders of magnitude error are possible due to factors such as:
   - fraction of an isotope assumed to be released from the fuel matrix
   - homogeneity of the activity in the RCS
   - whether or not sample is representative
   - effects of removal mechanisms
2. Given the possible magnitude of the above errors, no corrections are made for the following minor factors:
   - Radioactive decay (longer half-life nuclides chosen to minimize error)
   - Dilution volume (assumes CFT's have discharged and BWST injection to low alarm setpoint)
   - RCS temperature and density corrections
   - Reactor power history (assumes end of cycle activities for long lived nuclides and assumes shorter lived nuclides at equilibrium)
   - Release from the RCS. Nuclides chosen should remain in RCS (noble gases not included)
3. Appropriate corrections may be applied if desired. For example, if no water has been added from the CFT's or BWST, then results could be reduced by a factor of 5.5 (510,000 lb RCS mass vs. 2,800,000 lb mass RCS, BWST and CFT's)

Estimating Core Damage

1. COMPLETE Table 1.
2. REPORT results to Radiation Controls Coordinator and Accident Assessment Team

ASSESSMENT OF CORE DAMAGE BASED ON REACTOR COOLANT SAMPLE

DATE/TIME OF RCS SAMPLE:_____ DATE/TIME OF RX SHUTDOWN:_____

Table 1

Nuclide	(A) Sample Result (µCi/ml)	(B) Factor	(C) Curies In RCS (A)x(B)	(D) Core Inventory (Ci)	(E) Fractional Release to RCS (C)÷(D)	(F) Expected Gap Fraction	% Clad Failure (Note 1) 100x(E)+(F)	(G) Expected Fraction 100% Melt	% Fuel Melt/ Overheat 100x(E)+(G)
I-131		1300		6.7E7		0.05		0.4	
Cs-134		1300		8.9E6		0.05		0.3	
Cs-137		1300		5.0E6		0.05		0.3	
Te-132		1300		9.7E7		0	NA	0.05	
Ru-103		1300		9.4E7		0	NA	0.0025	
Ba-140		1300		1.3E8		0	NA	0.02	
Ce-144		1300		7.1E7		0	NA	0.0005	
Np-239		1300		1.3E9		0	NA	0.0005	

Note 1: Enter 100% if greater than 100%

_____
OSC Chemistry Coordinator Initial/Date

Guidelines for Operating EG&G Flow Technology Flow Meters

Zeroing flow totalizer

DEPRESS RESET button

Displaying Totalizer Reading

DEPRESS TOTAL (number 1) button. Total volume (gallons) is displayed

Displaying Flow Rate Reading

DEPRESS RATE (number 3) button. Flow rate (gpm) is displayed

Displaying both Totalizer and Flow Rate Readings

DEPRESS DISPLAY (number 0) button to display both total volume (gallons) and flow rate (gpm)

Guidelines for Liquid Grab Sampler Installation and Removal

Installation

NOTE
Grab sampler preparation is normally done in a low dose area.

1. PREPARE grab sampler
   a. ENSURE grab sampler bolted to grab sampler cart
   b. ENSURE transit cover removed from grab sampler
   c. STORE transit cover by attaching to lifting ring on grab sampler with break-away type device.
   d. OPEN CAV-492
   e. OPEN CAV-493

2. INSTALL grab sampler
   a. ENSURE ramp installed
   b. GUIDE grab sampler into sample station until sampler is within several inches of connection point
   c. CONTINUE to GENTLY guide grab sampler until fully inserted into sample station
   d. ENGAGE Cart to Station Lock
   e. GENTLY PULL Engagement Handle to connect quick connects
   f. DISENGAGE Cart to Station Lock
   g. ENSURE grab sampler moves when Engagement Handle is moved back and forth.
   h. ENGAGE Cart to Station Lock

Removal

1. ENSURE ramp installed0
2. SQUEEZE Engagement handle lever and PUSH to engagement handle toward wall
3. DISENGAGE Cart to Station Lock
4. REMOVE grab sampler from sample station

Grab Sample Shipment and Notifications

NOTE

Notifications may be made in any order.

1. NOTIFY Superintendent, Nuclear Operations Materials Controls
   - A grab sample has been collected
   - INITIATE acquisition process for shielded sample cask
2. NOTIFY RNP E&C Superintendent that a grab sample has been collected
3. The following information is needed:
   - Utility and plant name
   - Name and phone number of E&C Specialist to whom follow-up communication should be addressed
   - Number and type of samples being shipped
   - Measured radiation levels at surface and three feet from shipping container
   - Estimated shipping time
   - Mode of transportation
   - Carrier
   - Estimated time of arrival at RNP in Hartsville, SC
4. USE the following shipping address:

   Progress Energy Carolinas
   Robinson Nuclear Plant
   3581 West Entrance Road
   Hartsville, SC 29990
   Attn: E&C Superintendent
   Phone (Caronet) 450-1837

Estimating Grab Sample Curie Content When Gamma Spectroscopy System is Unavailable

1. DETERMINE which of the following best represents the sample. Emergency Response support personnel may be used to make this determination

   Pressurized Liquid Sample

   [ ] Fuel Gap Release – use column A

   OR

   [ ] Fuel Melt Release – use column B

   Depressurized Liquid Sample

   [ ] Fuel Gap Release- use column C

   OR

   [ ] Fuel Melt Release- use column D

2. RECORD Contact Dose Rate (side of pig) from the grab sample, CASB-5.

   Contact Dose Rate (side of pig) _____ mR/hr

3. DETERMINE µCi per mR/hr

   Pressurized Liquid Sample

   [ ] Fuel Gap Release = 2.00E+4 µCi per mR/hr

   OR

   [ ] Fuel Melt Release = 2.50E+4 µCi per mR/hr

   Depressurized Liquid Sample

   [ ] Fuel Gap Release = 1.50E+4 µCi per mR/hr

   OR

   [ ] Fuel Melt Release = 1.50E+4 µCi per mR/hr

4. CALCULATE total activity.

   *Total Activity = Contact Dose Rate (side of pig) **x** µCi per mR/hr*

   Total Activity _____ µCi

5. CALCULATE individual nuclide activity. RECORD results in Table 1.

   *Individual Nuclide Activity = Total Activity **x** nuclide fraction of total activity*

TABLE 1

	Column A		Column B		Column C		Column D	
Nuclide	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)
Co58			5.97E-06				1.47E-05	
Co60			4.58E-06				1.13E-05	
Kr85	1.22E-03		1.84E-03					
Kr85m	1.65E-02		2.49E-02					
Kr87	1.34E-03		2.02E-03					
Kr88	2.00E-02		3.01E-02					
Rb86	9.19E-05		4.16E-05		1.51E-04		1.02E-04	
Sr89			5.31E-03				1.30E-02	
Sr90			2.88E-04				7.07E-04	
Sr91			3.83E-03				9.40E-03	
Sr92			9.24E-04				2.27E-03	
Y90			2.83E-06				6.96E-06	
Y91			6.48E-05				1.59E-04	
Y92			1.49E-05				3.66E-05	
Y93			4.69E-05				1.15E-04	
Zr95			8.19E-05				2.01E-04	
Zr97			6.17E-05				1.51E-04	
Nb95			7.72E-05				1.89E-04	
Mo99			1.04E-03				2.56E-03	
Tc99m			3.90E-04				9.57E-04	
Ru103			8.39E-04				2.06E-03	
Ru105			1.58E-04				3.87E-04	
Ru106			1.92E-04				4.71E-04	
Rh105			3.25E-04				7.98E-04	
Sb127			9.76E-04				2.40E-03	
Sb129			1.02E-03				2.51E-03	
Te127			5.53E-04				1.36E-03	
Te127m			1.32E-04				3.25E-04	

TABLE 1 (*continued*)

Nuclide	Column A		Column B		Column C		Column D	
	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)
Te129			2.91E-05				7.14E-05	
Te129m			9.02E-04				2.21E-03	
Te131m			1.45E-03				3.55E-03	
Te132			1.61E-02				3.96E-02	
I131	1.54E-01		9.27E-02		2.53E-01		2.28E-01	
I132	2.09E-02		1.26E-02		3.44E-02		3.10E-02	
I133	2.56E-01		1.54E-01		4.22E-01		3.79E-01	
I134	6.63E-04		4.00E-04		1.09E-03		9.82E-04	
I135	1.36E-01		8.22E-02		2.24E-01		2.02E-01	
Xe133	3.20E-01		4.82E-01					
Xe135	3.41E-02		5.14E-02					
Cs134	2.13E-02		9.64E-03		3.51E-02		2.37E-02	
Cs136	6.37E-03		2.88E-03		1.05E-02		7.08E-03	
Cs137	1.19E-02		5.39E-03		1.96E-02		1.32E-02	
Ba139			1.67E-04				4.10E-04	
Ba140			9.08E-03				2.23E-02	
La140			8.23E-05				2.02E-04	
La141			2.10E-05				5.16E-05	
La142			2.29E-06				5.62E-06	
Ce141			2.09E-04				5.12E-04	
Ce143			1.73E-04				4.24E-04	
Ce144			1.26E-04				3.11E-04	

TABLE 1 (*continued*)

	Column A		Column B		Column C		Column D	
Nuclide	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)	Nuclide Fraction of Total Activity	Individual Nuclide Activity (µCi)
Pr143			7.89E-05				1.94E-04	
Nd147			3.51E-05				8.62E-05	
Np239			2.18E-03				5.35E-03	
Pu238			1.36E-07				3.34E-07	
Pu239			3.07E-08				7.54E-08	
Pu240			3.87E-08				9.51E-08	
Pu241			6.52E-06				1.60E-05	
Am241			1.72E-09				4.23E-09	
Cm242			6.59E-07				1.62E-06	
Cm244			3.86E-08				9.48E-08	

Manual Collimator Positioning and Manual Gamma Isotopic Analysis

NOTE

Starting with FAR CLOSED and progressively trying more efficient geometries is recommended but not required.

1. POSITION collimator and near line valves per Table 2 until one of the following criteria is met:
   - adequate count rate observed at CA-54-CE rate meter
   - NEAR OPEN position lined up with adequate count rate
   - OSC Chemistry Coordinator or designee determines geometry to be used
2. Manually PERFORM gamma spectroscopy analysis.

NOTE

The collimator position lights represent binary code. The 1, 2, and 3 lights may be disregarded when manually positioning the collimator. These lights represent a total of 7 binary units which is <10% of total collimator movement.

Table 2

Geometry		Binary Code Target	CA-54-XC Collimator Position Lights Lit	Near Line Valve Position			
				RCS AIMS		SUMP AIMS	
				CAV-514	CAV-517	CAV-546	CAV-549
RCS	Far Closed	258	1,2,9	CLOSED	CLOSED		
	Far Open	101	3,6,7	CLOSED	CLOSED		
	Near Closed	210	3,5,7,8	OPEN	OPEN		
	Near Open	51	3,5,6	OPEN	OPEN		
SUMP	Far Closed	706	1,7,8,10			CLOSED	CLOSED
	Far Open	868	1,3,6,7,9,10			CLOSED	CLOSED
	Near Closed	670	1,2,3,4,5,8,10			OPEN	OPEN
	Near Open	826	3,4,5,6,9,10			OPEN	OPEN

Revision History

1. Deleted RCS Hydrogen, pH and chloride sampling and analysis references due to their removal from Tech Specs. Reference LAR 279 and License Amendment 213.
2. Removed MWST sampling and analysis references due to their removal from Tech Specs. Reference LAR 279 and License Amendment 213.
3. Added reference to NOCS 100440 for maintaining contingency plans for obtaining and analyzing samples from the RCS, Containment sump and containment atmosphere to Section 3.
4. Added reference to NOCS 100441 for Classifying fuel damage events at the Alert Level for >300 uCi/gm I-131 Equivalent and for the capability for assessment of radioactive iodines released to the off-site environs to Section 3.
5. Updated Equipment Data Base Reference Section 2.2.
6. Changed title of procedure to reflect those sample points and analysis that are still applicable.