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Rev. 2

Effective Date 10/23/99

CHEMISTRY SAMPLING PROCEDURE

CH-632C

EMERGENCY PLAN IMPLEMENTING PROCEDURE

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

POST ACCIDENT SAMPLING AND ANALYSIS OF REACTOR COOLANT WHEN ON THE "B" DECAY HEAT SYSTEM

APPROVED BY: Procedure Owner

(SIGNATURE ON FILE)

DATE: 10/22/99

PROCEDURE OWNER: Nuclear Chemistry

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1.0 PURPOSE

This procedure provides instructions for sampling the "B" Decay Heat Train under accident conditions for Gamma Isotopic and Boron analyses using the Post Accident Sampling System.

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 1.97, Instrumentation For Light-Water Cooled Nuclear Power Plants To Assess Plant And Environs Conditions During And Following An Accident

2.1.9 RSP-600, ALARA Program

2.1.10 6059-S-002, APEX Technologies PASS Process Flow Diagrams

2.2 CMIS REFERENCES

DPDP-5A BREAKER 27, DPDP-5B BREAKER 8, CACP-1, CAV-126, CAV-1, CAV-3, CAV-431, CAV-432, CAV-429, CAV-430, CAV-626, CAV-627, CAV-484, CAV-439, CAV-636, CAV-519, CAV-447, CAV-437, CAV-448, CAV-623, CAV-625, CAP-10, CAP-14, CAV-436, CAV-434, CAV-442, CAV-440, CAV-624, CA-74-FI, CA-56-CI, CASB-5, AHF-55, CAV-492, CAV-493, CAV-445, CAV-446, CAV-471, DWV-337, CAP-8, CAT-8.

3.0 PERSONNEL INDOCTRINATION

3.1 DESCRIPTION

NOTE: The PASS is powered by the B ES Bus through ACDP-59.

The Post Accident Sampling System (PASS) is an on-line system designed to sample and evaluate various liquid and gaseous sample streams during an accident, including the "B" Decay Heat train. The liquid PASS Automated Isotopic And Chemical Measurement System (AIMS) consists of the subassembly used to perform Gamma Isotopic and Boron analyses of the "B" Decay Heat train.

3.2 LIMITS & PRECAUTIONS

3.2.1 Performance of all or part of this procedure will be done by direction of the Emergency Coordinator or designee.

3.2.2 Entries into the controlled access areas must have Radiation Monitoring Team preplanning, concurrence, and coverage as outlined in EM-104, Operation of the Operational Support Center. Controlled access areas will be defined by the Radiation Monitoring Team personnel.

3.2.3 During post-accident sampling, extremely high radiation exposure levels could be experienced. The ability to perform this procedure and stay within exposure limits will require ALARA pre-planning.

3.2.4 Return to the Lab if the dose rate at places requiring work is determined by the Health Physics Technician to be in excess of the limits specified in the pre-job briefing.

3.2.5 All sampling actions are performed on the Main Control Board by Operations, or in the Count Room either on the VAX Computer or from PASS CACP-1 and Nuclear Data Mimic Panels unless otherwise noted.

3.2.6 Section 4.1 must be completed prior to any sample team re-entry.

3.2.7 Sections 4.3, Gamma Isotopic Analysis, and Section 4.4, Boron Analysis, can be performed simultaneously.

4.0 INSTRUCTIONS

NOTE: **Section 4.1 must be completed prior to any sample team re-entries.**

4.1 SAMPLE TEAM CHECKLIST

	ACTIONS	DETAILS
4.1.1	ASSEMBLE Sample Team and REVIEW applicable procedures.	1. REVIEW the following procedures: _____ CH-632C, Post Accident Sampling and Analysis of the Reactor Coolant System When on the "B" Decay Heat Train _____ EM-104, Operation Of The Operational Support Center 2. LIST personnel performing entry and their dose margins: Name / Dose Margin 1. _____ 2. _____ 3. _____ 4. _____ _____ / _____ Initial/Date
4.1.2	DETERMINE analyses to be performed.	LIST analyses to be performed: _____ _____ _____ _____ / _____ Initial/Date

4.1 **SAMPLE TEAM CHECKLIST** (Cont'd)

	ACTIONS	DETAILS
4.1.3	DISCUSS supplies for obtaining a sample utilizing CASB-2.	IF obtaining CASB-2 grab sample, THEN ENSURE the following: ___ Allen wrench, or equivalent, as determined by Chemistry supervision, for removing T-Handle from grab sampler and attaching to new grab sampler ___ Knife, or equivalent, as determined by Chemistry supervision, to cut transit cover strap from lifting eye ___ New tie-wrap, or equivalent as determined by Chemistry supervision, to attach transit cover to new grab sampler lifting eye _____/_____ Initial/Date

ACTIONS	DETAILS
	NOTE: The following breakers are normally in the locked open (Off) position by Operations due to not having automatic ES closure functions.
4.1.4 ALIGN electrical power supplies	___ VERIFY Operations has performed EOP-14, Enclosure 2 PPO Post Event Actions. YES ___ NO ___ IF EOP-14, Enclosure 2 was not performed, THEN NOTIFY Operations ENSURE CLOSED the following breakers: ___ DPDP-5A Brk. No. 27 ___ DPDP-5B Brk. No. 8 _____/_____ Initial/Date

4.2 SAMPLE LINE-UP

	ACTIONS	DETAILS
4.2.1	PERFORM valve lineup to sample "B" Decay Heat train.	ENSURE CLOSED the following valves: 1. ___ CAV-126 2. ___ CAV-1 3. ___ CAV-3 4. ___ CAV-431 5. ___ CAV-432 6. ___ CAV-429 7. ___ CAV-430 8. ___ CAV-626 9. ___ CAV-627 10. ___ CAV-484 11. ___ CAV-439 12. ___ CAV-636 ENSURE OPEN the following: 13. ___ CAV-519 14. ___ CAV-447 15. ___ CAV-437 16. ___ CAV-448 ENSURE the following: 17. ___ CAV-623 to SAMPLE 18. ___ CAV-625 to SAMPLE 19. ___ CAV-626 to DRAIN TANK 20. ___ CAP-10 to AUTO 21. ___ CAP-10 Flow Control Switch to FULL CLOCKWISE 22. ___ CAP-14 to ON _____/_____ Initial/Date
4.2.2	NOTIFY Operations to OPEN Containment Isolation Valves	NOTIFY Operations OPEN the following: 1. ____ CAV-436 2. ____ CAV-434 _____/_____ Initial/Date

4.2 SAMPLE LINE-UP (Cont'd)

ACTIONS	DETAILS

NOTE: **Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.**

4.2.3 PERFORM valve lineup to SAMPLE "B" Decay Heat train.

OPEN the following:

1. ___ CAV-442
2. ___ CAV-440

NOTE: **Adjusting CAV-624 valve control knob towards OPEN or CLOSED position will vary flow and pressure accordingly.**

3. ___ THROTTLE CAV-624 to obtain flow rate between 0.35-0.50 gpm on CA-74-FI.

_____/_____
Initial/Date

4.3 GAMMA ISOTOPIC ANALYSIS

ACTIONS		DETAILS
4.3.1	FLUSH Sample lines	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed. NOTE: **While sample is flushing continue with Step 4.3.2.** 2. ___ FLUSH for at least 5 minutes _____/_____ Initial/Date
4.3.2	PERFORM pre-analysis PASS detector checks.	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor. ********** CAUTION: **Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ********** 2. ___ ENSURE high voltage applied to the PASS detector at value specified in PASS AND RANGE equipment logbook. 3. ___ ENSURE a weekly calibration check performed within the past 7 days per CH-234 as indicated on weekly countroom QC logsheet in Count Room Task logbook _____/_____ Initial/Date

ACTIONS	DETAILS
4.3.3 PERFORM Gamma Isotopic Analysis	1. ___ LOG ON the VAX computer as Username: PASS 2. ___ SELECT PASS MENU. 3. ___ ENTER NO to the prompt DO YOU WANT A SPECTRAL DISPLAY WINDOW?(Default) 4. ___ SELECT LIQUID SAMPLING. 5. ___ SELECT B DECAY HEAT TRAIN 6. EITHER: a.___ENTER Q to quit MUX display and continue with procedure, b.___OR RETURN to update MUX values. 7. ___ ENTER NO to abort sample (Default value). 8. ___ UPDATE sample parameters. 9. ___ SELECT ACCEPT. 10. ___ SELECT QUIT key to exit 11. ___ ENTER LO to log off VAX computer. 12. ___ ATTACH gamma scan to this procedure. 13. ___ NOTIFY OSC Chemistry Coordinator or his designee of results. Gamma Scan ID number: _____ _____/___/_____ Initial/Date/Time Gamma Scan ID number: _____ _____/___/_____ Initial/Date/Time Gamma Scan ID number: _____ _____/___/_____ Initial/Date/Time 14.___ IF Additional Gamma Isotopic Analysis are required, THEN REPEAT steps 1 through 13. 15.___ IF all analyses are complete, THEN PERFORM Demineralized Water Flush per Section 4.6. _____/_____ Initial/Date

4.3 GAMMA ISOTOPIC ANALYSIS (Cont'd)

ACTIONS		DETAILS
4.3.4	PERFORM Core Damage Assessment	1. ___ OSC Chemistry Coordinator or designee PERFORM Core damage assessment per Enclosure 2 _____/_____ Initial/Date

4.4 BORON ANALYSIS

4.4.1	PERFORM Boron analysis	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed. 2. ___ FLUSH sample through the Boronometer for at least one hour. _____ flush start time **NOTE: The Boron concentration of the sample will be displayed at the readout (CA-56-CI) located on PASS Analyzer Panel (CACP-1) in countroom.** Boron _____ PPM 3. ___ NOTIFY OSC Chemistry Coordinator or his designee of results. _____/_____/_____ Initial/Date/Time 4. ___ IF all analyses are complete, THEN PERFORM Demineralized Water Flush per Section 4.6. _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5

ACTIONS	DETAILS
NOTE: **Spare grab sample bombs are stored in the Oil Tank warehouse FIMIS # 1400513.**	
4.5.1 PREPARE CASB-5 (Grab Sampler) Sample Station for Sample collection.	NOTE: **CASB-5 exhaust (AHF-55) fan switch is located to the right of the Intermediate Building door (across from RM-A7)** ___ START CASB-5 (AHF-55) exhaust fan. _____/_____ Initial/Date
4.5.2 PERFORM Valve Alignment	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed. 2. ___ OPEN CAV-445. 3. ___ OPEN CAV-446. 4. ___ CLOSE CAV-447. 5. ___ FLUSH for at least 15 minutes. _____/_____ Initial/Date
4.5.3 ISOLATE Grab sample.	NOTE: **The T-handle operator for CAV-492 and CAV-493 is attached to CASB-5.** 1. ___ CLOSE CAV-492 using T-handle. 2. ___ CLOSE CAV-493 using T-handle. _____/_____ Initial/Date
4.5.4 ISOLATE CASB-5	1. ___ OPEN CAV-447 2. ___ CLOSE CAV-445 3. ___ CLOSE CAV-446 _____/_____ Initial/Date
4.5.5 CLOSE Sample Isolation Valves.	1. ___ CLOSE CAV-442 2. ___ CLOSE CAV-440 _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5 (Cont'd)

ACTIONS	DETAILS
NOTE: Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.	
4.5.6 ESTABLISH Demineralized Water Flush	1. ___ CLOSE CAV-624 2. ___ OPEN DWV-337 3. ___ OPEN CAV-471 4. ___ START CAP-8
	NOTE: Adjusting CAV-624 valve control knob towards OPEN or CLOSED position will vary flow and pressure accordingly.
	5. ___ THROTTLE CAV-624 to obtain a flow rate between 0.35-0.50 gpm on CA-74-FI.
	NOTE: While sample is flushing you may continue with 4.5.7.
	6. ___ FLUSH for at least 10 minutes
	_____/_____ Initial/Date

ACTIONS		DETAILS
4.5.7	A.I.M.S. Flushing Pre-Requisites	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor. 2. ___ ENSURE high voltage applied to the PASS detector at value specified in PASS and RANGE AIMS Equipment logbook. ********** **CAUTION: Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ********** 3. ___ ENSURE weekly calibration check performed within past seven days per CH-234 as indicated on weekly Count Room QC logsheet in Count Room Task Logbook. _____/_____ Initial/Date
4.5.8	PERFORM A.I.M.S. Flush	1. ___ LOG ON the VAX computer as Username: PASS 2. ___ SELECT PASS MENU. 3. ___ ENTER NO to DO YOU WANT A SPECTRAL DISPLAY WINDOW? (Default) 4. ___ SELECT FLUSH SAMPLE LINES. 5. ___ SELECT SUMP DEMIN FLUSH. 6. ___ MAXIMIZE MCA Display 1 and toggle through ADC's until RCS CONFIGURATION shown. 7. ___ SELECT the ERASE function on MCA Display to re-acquire spectrum. 8. ___ When a low stable countrate is indicated MINIMIZE MCA Display 1. 9. ___ SELECT RETURN. 10. ___ DEPRESS PF4 to QUIT. 11. ___ ENTER LO to log off. _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5 (Cont'd)

	ACTIONS	DETAILS
4.5.9	FLUSH CASB-5 (Grab Sampler)	1. ___ OPEN CAV-445. 2. ___ OPEN CAV-446. 3. ___ CLOSE CAV-447. 4. ___ FLUSH for at least 5 minutes. _____/_____ Initial/Date
4.5.10	ISOLATE CASB-5	1. ___ OPEN CAV-447. 2. ___ CLOSE CAV-445. 3. ___ CLOSE CAV-446. _____/_____ Initial/Date
4.5.11	SECURE Demineralized water flush after grab sampling	1. ___ STOP CAP-8. 2. ___ CLOSE DWV-337. 3. ___ CLOSE CAV-471. 4. ___ CLOSE CAV-519. 5. ___ CLOSE CAV-447. 6. ___ CLOSE CAV-623. 7. ___ CLOSE CAV-624. 8. ___ CLOSE CAV-625. 9. ___ CLOSE CAV-626. _____/_____ Initial/Date
4.5.12	NOTIFY Operations to CLOSE Containment Isolation Valves.	NOTIFY Operations CLOSE the following: 1. ___ CAV-436 2. ___ CAV-434 _____/_____ Initial/Date

ACTIONS		DETAILS
4.5.13	REMOVE CASB-5 (GRAB SAMPLER)	1. ___ OBTAIN 3/4" wrench from Primary Chemistry lab key locker. 2. ___ PROCEED to CASB-5 location, 95' elevation Auxiliary building. 3. ___ REMOVE the Grab Sampler ramp from storage location. 4. ___ INSTALL the Grab Sampler ramp in front of sample station. 5. ___ DISCONNECT CASB-5 from the sample station: a. ___ SQUEEZE disengagement lever b. ___ PUSH the engagement handle to its rearmost position. c. ___ PULL UP on cart handle locking mechanism to release the cart. d. ___ REMOVE CASB-5 cart from sample station. 6. ___ INSTALL the transit cover over the quick connects. 7. ___ REMOVE the cart and move to the Turbine Building crane well. 8. ___ UNBOLT CASB-5 from the cart using 3/4" wrench. 9. ___ REMOVE T-handle operator. 10. ___ GO TO section 5.0 to prepare CASB-5 for shipment off-site. _____/_____ Initial/Date

ACTIONS	DETAILS
4.5.14 INSTALL new Grab Sampler.	1. ___ BOLT new Grab Sampler onto cart. 2. ___ REMOVE transit cover. 3. ___ ATTACH transit cover to lifting ring on grab sampler. 4. ___ ATTACH T-handle operator to grab sampler. 5. ___ OPEN CAV-492 using T-handle. 6. ___ OPEN CAV-493 using T-handle. 7. ___ PROCEED to sample station. ********** **CAUTION: When connecting CASB-5, force should NEVER be used. Damage to quick connects will result from forcing connection.** ********** **NOTE: Repeated attempts may be necessary to successfully align CASB-5.** 8. ENGAGE Grab Sampler CASB-5 a. ___ One person GUIDE CASB-5 b. ___ Another person PUSH CASB-5 UP Ramp AND onto Platform, c. ___ HALT CASB-5 several inches from connection points. **NOTE: WHEN positioned correctly, front of CASB-5 will make metal to metal contact with curved face of sample station.** d. ___ SLOWLY PUSH CASB-5 into Sample Station. e. ___ ENGAGE Cart to Station Locking Mechanism. f. ___ PUSH Locking Mechanism handle completely down, DRIVING lock bolt through hole in cart. _____/_____ Initial/Date

ACTIONS	DETAILS
4.5.14 (Continued)	********** CAUTION: **When engaging handle, force should NEVER be used. Damage to quick connects will result from forcing connection.** **********
	NOTE: Due to environmental conditions, the click may not be heard.
	g. ___ GENTLY PULL Engagement Handle forward until a distinct "click" is heard. This signifies that quick connect couplings have engaged.
	h. ___ ENSURE engagement:
	a. ___ UNLOCK Cart from station by pulling up on cart handle locking mechanism.
	b. ___ MOVE engagement handle back and forth.
	c. ___ IF properly connected, Cart will move back and forth.
	i. ___ RE-LOCK Cart to Station by pushing locking mechanism handle completely down, driving lock bolt through hole in cart.
	_____/_____ Initial/Date

4.6 DEMINERALIZED WATER FLUSH

	ACTIONS	DETAILS
4.6.1	CLOSE Sample Isolation Valves	1. ___ CLOSE CAV-442 2. ___ CLOSE CAV-440 _____/_____ Initial/Date

NOTE: Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.

4.6.2	ESTABLISH Demineralized Water Flow	1. ___ CLOSE CAV-624 2. ___ OPEN DWV-337 3. ___ OPEN CAV-471 4. ___ START CAP-8 NOTE: **Adjusting the CAV-624 valve control knob towards OPEN or CLOSED position will vary flow and pressure accordingly.** 5. ___ THROTTLE CAV-624 to obtain flow, between 0.35-0.50 gpm on CA-74-FI. _____/_____ Initial/Date
4.6.3	FLUSH system	**NOTE: Steps 4.6.3 and 4.6.4 may be performed concurrently.** ___ FLUSH system for at least 10 minutes. _____/_____ Initial/Date

ACTIONS		DETAILS
4.6.4	A.I.M.S. Flushing Pre-Requisites	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor. 2. ___ ENSURE high voltage applied to the PASS detector at value specified in PASS And RANGE AIMS Equipment Logbook. ********** **CAUTION: Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ********** 3. ___ ENSURE weekly calibration check performed within past seven days per CH-234 as indicated on weekly Count Room QC logsheet in Count Room Task Logbook. _____/_____ Initial/Date

NOTE: ERASE cannot be performed from a remote terminal

4.6.5	PERFORM A.I.M.S. Flush	1. ___ LOG ON the VAX computer as Username: PASS 2. ___ SELECT PASS MENU. 3. ___ ENTER NO to DO YOU WANT A SPECTRAL DISPLAY WINDOW? (Default) 4. ___ SELECT FLUSH SAMPLE LINES. 5. ___ SELECT SUMP DEMIN FLUSH. 6. ___ MAXIMIZE MCA Display 1 and toggle through ADC's until RCS CONFIGURATION shown. 7. ___ SELECT the ERASE function on MCA Display to re-acquire spectrum. 8. ___ When a low stable countrate is indicated MINIMIZE MCA Display 1. 9. ___ SELECT RETURN. 10. ___ DEPRESS PF4 to QUIT. 11. ___ ENTER LO to log off. _____/_____ Initial/Date

4.6 DEMINERALIZED WATER FLUSH (Cont'd)

	ACTIONS	DETAILS
4.6.6	SECURE Demineralized Water Flush	1. ___ STOP CAP-8 2. ___ CLOSE DWV-337. 3. ___ CLOSE CAV-471 4. ___ CLOSE CAV-519 5. ___ CLOSE CAV-447 6. ___ CLOSE CAV-623 7. ___ CLOSE CAV-624 8. ___ CLOSE CAV-625 9. ___ CLOSE CAV-626 NOTIFY Operations CLOSE the following: 10. ___ CAV-436 11. ___ CAV-434.

_____/_____
Initial/Date

4.7 SYSTEM RESTORATION

4.7.1	SECURE flow	ENSURE CLOSED the following: 1. ____ CAV-442 2. ____ CAV-440 3. ____ CAV-471 4. ____ CAV-447 5. ____ CAV-448 6. ____ CAV-484 7. ____ CAV-519 8. ____ CAV-623 9. ____ CAV-624 10. ____ CAV-625 11. ____ CAV-626 12. ____ CAV-627

_____/_____
Initial/Date

5.0 CONTINGENCIES

5.1 CAT-8 HI-HI LEVEL ALARM

	ACTIONS	DETAILS
5.1.1	PERFORM lineup	ENSURE the following: 1. ___ CAP-10 OFF 2. ___ CAV-623 CLOSED 3. ___ CAV-627 CLOSED 4. ___ CONCURRENTLY PERFORM the following until CAT-8 HI-HI level alarm light clears: o DEPRESS and hold RESET button on Drain Tank level indicator o SELECT CAP-10 to ON 5. ___ OPEN CAV-623. 6. ___ SELECT CAP-10 to AUTO 7. ___ RETURN to the step in the procedure which was in progress when the CAT-8 HI-HI level alarm occurred _____/_____ Initial/Date

5.2 NOTIFICATIONS AND SHIPMENT

ACTIONS	DETAILS

NOTE: The Emergency 24 hour access phone number is (804) 522-5833.

NOTE: Spare grab sample bombs are stored in the Oil Tank warehouse FIMIS # 1400513.

5.2.1 PERFORM notifications

___ NOTIFY the Manager, Nuclear Operations Materials Controls, that a grab sample has been taken and to initiate acquisition process for shielded sample cask.

___ NOTIFY the BWX Technologies Emergency Sample Coordinator when a grab sample has been collected that will require offsite analysis.

___ Required information to be made available:

- o Utility and plant name
- o Name and phone of ChemRad Specialist to whom follow-up communication should be addressed.
- o Number and type of samples to be shipped (i.e., liquid, gaseous, or iodine cartridge).
- o Measured radiation levels at the surface and three feet from the shipping container.
- o Estimated shipping time, mode of transportation, carrier, and estimated arrival at BWX Technologies site in Lynchburg, VA.

Shipping Address:

BWX Technologies Lynchburg
Technology Center
Route 726, Mt. Athos Road
Lynchburg, VA. 24506
Attn: Kenneth D. Long
(804)-522-5982

___ All data accumulated per this procedure is to be summarized on Enclosure 1 and forwarded to the Emergency Coordinator via Chemistry Supervision.

_____/_____
Initial/Date

ENCLOSURE 1

TECHNICAL SUPPORT CENTER DATA SHEET

"B" DECAY HEAT TRAIN SAMPLE

Gamma Isotopic and/or Boron Analysis Results

Boron _____ ppm _____/_____/_____
Initial/Date/Time

Boron _____ ppm _____/_____/_____
Initial/Date/Time

Boron _____ ppm _____/_____/_____
Initial/Date/Time

Boron _____ ppm _____/_____/_____
Initial/Date/Time

Total Activity _____ uCi/cc

Major Contributing Isotopes

Isotope	Activity	
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc
_____	_____	uCi/cc

_____/_____/_____
Initial/Date/Time

ASSESSMENT OF CORE DAMAGE BASED ON REACTOR COOLANT SAMPLE ('B' DECAY HEAT)

1. This method of confirming core damage assumes that releases from the core are uniformly mixed in the 'B' Decay Heat Train AND there is no dilution from injection.

2. The baseline coolant concentrations in Table 1 are for 0.5 hour after shutdown of a core that has been through at least one refueling cycle.

3. The half-life of the fission products should be considered in analyzing samples.

4. Compare the 'B' Decay Heat PASS sample activities from Enclosure 1 with the baseline coolant concentrations in Table 1. This table overestimates the concentration of the long-lived fission products (Cs and Sr) in a new core.

5. Determine the extent of core damage as indicated by Table 1 (i.e., normal, gas gap, core melt).

TABLE 1

BASELINE REACTOR COOLANT CONCENTRATION

Nuclide	Normal Concentration (uCi/g)	Concentration After Gap Release (uCi/g)	Concentration After Core Melt (uCi/g)	TMI Concentration + 48 Hours (uCi/g)
I-131	4E-2	2E4	1E5	1.3E4
I-133	1E-1	3E4	2E5	6.5E3
I-135	2E-1	3E4	2E5	No Data
Cs-134	7E-3	2E3	8E3	6.3E1
Cs-137	9E-3	9E2	5E3	2.8E2
Ba-140	No Data	No Data	3E4	No Data
Sr-90	1E-5	No Data	1E4	5.3

6. Report determination to Dose Assessment Coordinator.

_____ /
Initial/Date

PROCEDURE DEVELOPMENT AND REVISION RECORD

Procedure: CH0632C **New Rev:** 2 **PRR#:** 17341

Title: POST ACCIDENT SAMPLING AND ANALYSIS OF REACTOR COOLANT WHEN ON THE "B" DECAY HEAT SYSTEM

MINOR CHANGES

If Minor Changes are included, check the applicable box(es) and provide a list of affected steps.
The following corrections are incorporated throughout:

- _ Sentence Structure
- _ Punctuation
- _ Capitalization
- _ Spelling
- _ Organizational Changes: position titles, department names, or telephone numbers
- _ Redundant words or phrases
- _ Abbreviations
- _ Obviously incorrect units of measure
- _ Inadvertently omitted symbols (#, %, etc.)
- _ Obvious step numbering discrepancies
- _ Format

The following corrections are incorporated in the step(s) indicated: "Throughout" is used in lieu of Step# if a specific change affects a large number of steps.

	Correcting equipment nomenclature that does not agree with field labels or balance of procedure
	Changing information that is obviously incorrect and referenced correctly elsewhere
	Misplaced decimals that are neither setpoint values nor tolerances
	Reference to a procedure when an approved procedure has taken the place of another procedure
	Fixing branching points when it is clear the branching steps were originally intended but were overlooked or incorrectly stated due to step number changes
	Adding clarifying information such as NOTES and CAUTIONS
	Adding words to clarify steps, NOTES, or CAUTIONS which clearly do not change the methodology or intent of the steps

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The following corrections are incorporated throughout:

- _ Sentence Structure
- _ Punctuation
- _ Capitalization
- _ Spelling
- X Organizational Changes: position titles, department names, or telephone numbers
- _ Redundant words or phrases
- _ Abbreviations
- _ Obviously incorrect units of measure
- _ Inadvertently omitted symbols (#, %, etc.)
- X Obvious step numbering discrepancies
- X Format

The following corrections are incorporated in the step(s) indicated: "Throughout" is used in lieu of Step# if a specific change affects a large number of steps.

	Correcting equipment nomenclature that does not agree with field labels or balance of procedure
	Changing information that is obviously incorrect and referenced correctly elsewhere
	Misplaced decimals that are neither setpoint values nor tolerances
	Reference to a procedure when an approved procedure has taken the place of another procedure
	Fixing branching points when it is clear the branching steps were originally intended but were overlooked or incorrectly stated due to step number changes
5.2	**Adding clarifying information such as NOTES and CAUTIONS**
	Adding words to clarify steps, NOTES, or CAUTIONS which clearly do not change the methodology or intent of the steps

PROCEDURE DEVELOPMENT AND REVISION RECORD

Procedure: CH0632C **New Rev:** 2 **PRR#:** 17341

Title: POST ACCIDENT SAMPLING AND ANALYSIS OF REACTOR COOLANT WHEN ON THE "B" DECAY HEAT SYSTEM

NON-INTENT CHANGES

Changes are incorporated for the reasons provided. "Throughout" is used in lieu of Step # if a specific change affects a large number of steps. For new or cancelled procedures the reason is provided.

3.2.1, 3.2.2, 4.1.1, 4.1.3, 4.1.4	Clarify instructions.
3.2.4	Correct dose limits to agree with pre-job briefing.

Rev. 4

Effective Date 10/23/99

EMERGENCY PLAN IMPLEMENTING PROCEDURE

CH-632D

EMERGENCY PLAN IMPLEMENTING PROCEDURE

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

POST ACCIDENT SAMPLING AND ANALYSIS OF THE REACTOR BUILDING SUMP

APPROVED BY: Procedure Owner

(SIGNATURE ON FILE)

DATE: 10/22/99

PROCEDURE OWNER: Nuclear Chemistry

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1.0 PURPOSE

This procedure provides instructions for sampling the Reactor Building Sump under accident conditions for Gamma Isotopic and Boron analyses using the Post Accident Sampling System.

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 1.97, Instrumentation For Light-Water Cooled Nuclear Power Plants To Assess Plant And Environs Conditions During And Following An Accident

2.1.9 RSP-600, ALARA Program

2.1.10 6059-S-002, APEX Technologies PASS Process Flow Diagrams

2.2 CMIS REFERENCES

DPDP-5A BREAKER 27, DPDP-5B BREAKER 8, CACP-1, CAV-126, CAV-1, CAV-3, CAV-431, CAV-432, CAV-429, CAV-430, CAV-626, CAV-627, CAV-484, CAV-439, CAV-636, CAV-519, CAV-447, CAV-437, CAV-448, CAV-623, CAV-625, CAP-10, CAP-14, CAV-436, CAV-434, CAV-500, CAV-624, CA-74-FI, CA-56-CI, CASB-5, AHF-55, CAV-492, CAV-493, CAV-445, CAV-446, CAV-471, DWV-337, CAP-8, CAT-8, CAV-470, CAV-433, CAV-435

3.0 PERSONNEL INDOCTRINATION

3.1 DESCRIPTION

NOTE: The PASS is powered by the B ES Bus through ACDP-59.

The Post Accident Sampling System (PASS) is an on-line system designed to sample and evaluate various liquid and gaseous sample streams during an accident, including the Reactor Building Sump. The liquid PASS Automated Isotopic And Chemical Measurement System (AIMS) consists of the subassembly used to perform Gamma Isotopic and Boron analyses of the Reactor Building Sump.

3.2 LIMITS & PRECAUTIONS

3.2.1 Performance of all or part of this procedure will be done by direction of the Emergency Coordinator or designee.

3.2.2 Entries into the controlled access areas must have Radiation Monitoring Team preplanning, concurrence, and coverage as outlined in EM-104, Operation of the Operational Support Center. Controlled access areas will be defined by the Radiation Monitoring Team personnel.

3.2.3 During post-accident sampling, extremely high radiation exposure levels could be experienced. The ability to perform this procedure and stay within exposure limits will require ALARA pre-planning.

3.2.4 Return to the Lab if the dose rate at places requiring work is determined by the Health Physics Technician to be in excess of the limits specified in the pre-job briefing.

3.2.5 All sampling actions are performed on the Main Control Board by Operations, or in the Count Room either on the VAX Computer or from PASS CACP-1 and Nuclear Data Mimic Panels unless otherwise noted.

3.2.6 Section 4.1 must be completed prior to any sample team re-entry.

3.2.7 Sections 4.3, Gamma Isotopic Analysis, and Section 4.4, Boron Analysis, can be performed simultaneously.

4.0 INSTRUCTIONS

NOTE: Section 4.1 must be completed prior to any sample team re-entries.

4.1 SAMPLE TEAM CHECKLIST

	ACTIONS	DETAILS
4.1.1	ASSEMBLE Sample Team and REVIEW applicable procedures.	1. REVIEW the following procedures: ____ CH-632C, Post Accident Sampling and Analysis of the Reactor Coolant System When on the "B" Decay Heat Train ____ EM-104, Operation Of The Operational Support Center 2. LIST personnel performing entry and their dose margins: Name Dose Margin 1._____ 2._____ 3._____ 4._____ 5._____ _____/_____ Initial/Date
4.1.2	DETERMINE Reactor Building Sump sample lineup and analyses to perform	1. SELECT sample lineup to perform a. ___ Primary Sample Path b. ___ Alternate Sample Path 2. LIST analyses to perform: _____ _____ _____ _____ _____/_____ Initial/Date

4.1 SAMPLE TEAM CHECKLIST (Cont'd)

ACTIONS	DETAILS
4.1.3 DISCUSS supplies for obtaining a sample utilizing CASB-2.	IF obtaining CASB-2 grab sample, THEN ENSURE the following: ___ Allen wrench, or equivalent, as determined by Chemistry supervision, for removing T-Handle from grab sampler and attaching to new grab sampler ___ Knife, or equivalent, as determined by Chemistry supervision, to cut transit cover strap from lifting eye ___ New tie-wrap, or equivalent as determined by Chemistry supervision, to attach transit cover to new grab sampler lifting eye _____/_____ Initial/Date

4.1 SAMPLE TEAM CHECKLIST (Cont'd)

ACTIONS	DETAILS
NOTE: **The following breakers are normally in the locked open (Off) position by Operations due to not having automatic ES closure functions**	
4.1.4 ALIGN electrical power supplies	___ VERIFY Operations has performed EOP-14, Enclosure 2, PPO Post Event Actions. YES ___ NO ___ IF EOP-14, Enclosure 2, was not performed, THEN NOTIFY Operations ENSURE CLOSED the following breakers: 1. ___ DPDP-5A, Brk. No. 27 2. ___ DPDP-5B, Brk. No. 8 _____/_____ Initial/Date

4.2 SAMPLE LINE-UP

ACTIONS	DETAILS
4.2.1 PERFORM valve lineup to sample RB Sump	ENSURE CLOSED the following valves: 1. ___ CAV-126 2. ___ CAV-1 3. ___ CAV-3 4. ___ CAV-431 5. ___ CAV-432 6. ___ CAV-429 7. ___ CAV-430 8. ___ CAV-626 9. ___ CAV-627 10. ___ CAV-484 11. ___ CAV-439 12. ___ CAV-636 ENSURE OPEN the following: 13. ___ CAV-519 14. ___ CAV-447 15. ___ CAV-437 16. ___ CAV-448 ENSURE the following: 17. ___ CAV-623 to SAMPLE 18. ___ CAV-625 to SAMPLE 19. ___ CAV-626 to DRAIN TANK 20. ___ CAP-10 to AUTO 21. ___ CAP-10 Flow Control Switch to FULL CLOCKWISE 22. ___ CAP-14 to ON _____/_____ Initial/Date

4.2 SAMPLE LINE-UP (Cont'd)

ACTIONS		DETAILS
4.2.2	OPEN Containment Isolation Valves	___ IF using the Primary Sample Path THEN NOTIFY Operations OPEN the following: 1. ___ CAV-436 2. ___ CAV-434 **NOTE: CAV-500 is in the Intermediate Building.** ___ IF using the Alternate Sample Path, THEN 1. ___ OPEN CAV-500 2. ___ OPEN CAV-439 3. ___ CLOSE CAV-448 _____/_____ Initial/Date
4.2.3	INITIATE demineralized water flow to PRIME CAP-8	OPEN the following: 1. ___ DWV-337 2. ___ CAV-471 3. ___ START CAP-8 4. ___ THROTTLE CAV-624 to obtain flow rate between 0.35-0.50 gpm on CA-74-FI _____/_____ Initial/Date

4.2 SAMPLE LINE-UP (Cont'd)

	ACTIONS	DETAILS
4.2.4	OPEN Containment Isolation Valves	___ IF using the Primary Sample Path, THEN NOTIFY Operations OPEN the following: 1. ___ CAV-433 2. ___ CAV-435 ___ IF using the Alternate Sample Path, THEN NOTIFY Operations OPEN the following: 1. ___ CAV-434 2. ___ CAV-436 _____/_____ Initial/Date
4.2.5	SECURE the demineralized priming water	WHEN sample flow has stabilized on CA-74-FI (approximately 5 minutes), THEN CLOSE: ___ CAV-471 ___ DWV-337 _____/_____ Initial/Date

NOTE: Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.

4.2.6	ADJUST sample flow for Gamma Isotopic, Boron, or Grab Sample	___ THROTTLE CAV-624 to obtain flow rate between 0.35-0.50 gpm on CA-74-FI _____/_____ Initial/Date

4.3 GAMMA ANALYSIS

ACTIONS		DETAILS
4.3.1	FLUSH RB Sump Sample	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed **NOTE: While flushing you may continue with Step 4.3.2 and 4.3.3.** 2. ___ FLUSH for at least 35 minutes
4.3.2	PERFORM pre-analysis PASS detector checks	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor ** **CAUTION: Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ** 2. ___ ENSURE high voltage applied to PASS detector at value specified in PASS AND RANGE equipment logbook 3. ___ ENSURE a weekly calibration check has been performed within the past 7 days as indicated on weekly countroom QC log sheet in Count Room Task logbook _____/_____ Initial/Date

ACTIONS	DETAILS
4.3.3 PERFORM Gamma Isotopic Analysis	1. ___ LOG ON VAX computer as Username: PASS 2. ___ SELECT PASS MENU 3. ___ ENTER NO to prompt DO YOU WANT A SPECTRAL DISPLAY WINDOW?(Default) 4. ___ SELECT LIQUID SAMPLING 5. ___ SELECT Reactor Building Sump Sample **NOTE: Ensure sample flush time is completed prior to continuing.** 6. EITHER: a. ___ ENTER Q to quit MUX display and continue with procedure, b. ___ OR RETURN to update MUX values 7. ___ ENTER NO to abort sample (Default value) 8. ___ UPDATE sample parameters 9. ___ SELECT ACCEPT 10. ___ SELECT QUIT key to exit 11. ___ ENTER LO to log off VAX computer 12. ___ ATTACH gamma scan to this procedure 13. ___ REPORT results to OSC Chemistry Coordinator or his designee Gamma Scan ID number: _____ _____/_____/_____ Initial/ Date / Time Gamma Scan ID number: _____ _____/_____/_____ Initial/ Date / Time Gamma Scan ID number: _____ _____/_____/_____ Initial/ Date / Time

Continued on Next Page

4.3 GAMMA ANALYSIS (Cont'd)

ACTIONS		DETAILS
4.3.3	Cont'd	14. ___ IF Additional Gamma Isotopic Analysis are required, THEN REPEAT Steps 1 through 13 15. ___ IF all analyses are complete, THEN PERFORM Demineralized Water Flush per Section 4.6 _____/_____ Initial/Date
4.3.4	PERFORM Core Damage Assessment	1. ___ OSC Chemistry Coordinator or designee PERFORM Core damage assessment per Enclosure 2 _____/_____ Initial/Date

4.4 BORON ANALYSIS

ACTIONS	DETAILS
4.4.1 PERFORM Boron analysis	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed 2. ___ FLUSH sample through the Boronometer for at least one hour _____ Flush Start Time **NOTE: The Boron concentration of the sample will be displayed at the readout (CA-56-CI) located on PASS Analyzer Panel (CACP-1) in countroom.** Boron _____ PPM _____ 3. ___ NOTIFY OSC Chemistry Coordinator or designee of results _____/_____/_____ Initial/ Date / Time 4. ___ IF all analyses are complete, THEN PERFORM Demineralized Water Flush per Section 4.6 _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5

NOTE: Spare grab sample bombs are stored in the Oil Tank warehouse FIMIS # 1400513.

	ACTIONS	DETAILS
4.5.1	PREPARE CASB-5 (Grab Sampler) Sample Station for Sample collection	**NOTE: CASB-5 exhaust fan (AHF-55) switch is located to the right of the Intermediate Building door (across from RM-A7)** ___ START CASB-5 exhaust fan _____/_____ Initial/Date
4.5.2	PERFORM Valve Alignment	1. ___ ENSURE Section 4.2 SAMPLE LINE-UP performed 2. ___ OPEN CAV-445 3. ___ OPEN CAV-446 4. ___ CLOSE CAV-447 5. ___ FLUSH for at least 15 minutes _____/_____ Initial/Date
4.5.3	ISOLATE Grab sample	**NOTE: The T-handle operator for CAV-492 and CAV-493 is attached to CASB-5.** 1. ___ CLOSE CAV-492 using T-handle 2. ___ CLOSE CAV-493 using T-handle _____/_____ Initial/Date
4.5.4	ISOLATE CASB-5	1. ___ OPEN CAV-447 2. ___ CLOSE CAV-445 3. ___ CLOSE CAV-446 4. ___ STOP CAP-8 _____/_____ Initial/Date

ACTIONS		DETAILS
4.5.5	CLOSE Sample Isolation Valves	___ IF using the Primary Sample Path THEN NOTIFY Operations CLOSE the following: 1. ___ CAV-433 2. ___ CAV-435 ___ IF using the Alternate Sample Path, THEN NOTIFY Operations CLOSE the following: 1. ___ CAV-434 2. ___ CAV-436 **NOTE: CAV-500 is in the Intermediate Building.** ___ CLOSE CAV-500 _____/_____ Initial/Date

NOTE: Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.

4.5.6	ESTABLISH Demineralized Water Flush	1. ___ CLOSE CAV-624 2. ___ OPEN DWV-337 3. ___ OPEN CAV-471 4. ___ START CAP-8 5. ___ THROTTLE CAV-624 to obtain a flow rate between 0.35-0.50 gpm on CA-74-FI **NOTE: While flushing you may continue with Step 4.5.7 and Step 4.5.8.** 6. ___ FLUSH for at least 10 minutes _____/_____ Initial/Date

ACTIONS		DETAILS
4.5.7	A.I.M.S. Flushing Pre-Requisites	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor 2. ___ ENSURE high voltage applied to the PASS detector at value specified in PASS and RANGE AIMS Equipment logbook ********** **CAUTION: Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ********** 3. ___ ENSURE weekly calibration check performed within past seven days per CH-234 as indicated on weekly Count Room QC log sheet in Count Room Task Logbook _____/_____ Initial/Date
4.5.8	PERFORM A.I.M.S. Flush	1. ___ LOG ON the VAX computer as Username: PASS 2. ___ SELECT PASS MENU 3. ___ ENTER NO to DO YOU WANT A SPECTRAL DISPLAY WINDOW? (Default) 4. ___ SELECT FLUSH SAMPLE LINES 5. ___ SELECT SUMP DEMIN FLUSH 6. ___ MAXIMIZE MCA Display 1 and toggle through ADC's until RCS CONFIGURATION shown 7. ___ SELECT the ERASE function on MCA Display to re-acquire spectrum 8. ___ When a low stable count rate is indicated MINIMIZE MCA Display 1 9. ___ SELECT RETURN 10. ___ DEPRESS PF4 to QUIT 11. ___ ENTER LO to log off _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5 (Cont'd)

	ACTIONS	DETAILS
4.5.9	FLUSH CASB-5	1. ___ OPEN CAV-445 2. ___ OPEN CAV-446 3. ___ CLOSE CAV-447 4. ___ FLUSH for at least 5 minutes _____/_____ Initial/Date
4.5.10	ISOLATE CASB-5	1. ___ OPEN CAV-447 2. ___ CLOSE CAV-445 3. ___ CLOSE CAV-446 _____/_____ Initial/Date
4.5.11	SECURE Demineralized water flush after grab sampling	1. ___ STOP CAP-8 2. ___ CLOSE DWV-337 3. ___ CLOSE CAV-471 CLOSE the following: 4. ___ CAV-519 5. ___ CAV-447 6. ___ CAV-623 7. ___ CAV-624 8. ___ CAV-625 9. ___ CAV-626 _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5 (Cont'd)

	ACTIONS	DETAILS
4.5.12	CLOSE Containment Isolation Valves	NOTIFY Operations CLOSE the following: 1. ___ CAV-436 2. ___ CAV-434 **NOTE: CAV-500 is in the Intermediate Building** 3. ___ IF Alternate Sample Path was used, THEN CLOSE CAV-439 4. ENSURE CLOSED: ___ CAV-448 ___ CAV-500 _____/_____ Initial/Date

4.5 GRAB SAMPLE COLLECTION AT CASB-5 (Cont'd)

ACTIONS		DETAILS
4.5.13	REMOVE CASB-5 (GRAB SAMPLER)	1. ___ OBTAIN 3/4" wrench from Primary Chemistry lab key locker 2. ___ PROCEED to CASB-5 location, 95' elevation Auxiliary building 3. ___ REMOVE the Grab Sampler ramp from storage location 4. ___ INSTALL the Grab Sampler ramp in front of sample station 5. ___ DISCONNECT CASB-5 from the sample station: a. ___ SQUEEZE disengagement lever b. ___ PUSH the engagement handle to its rearmost position c. ___ PULL UP on cart handle locking mechanism to release the cart d. ___ REMOVE CASB-5 cart from sample station 6. ___ INSTALL the transit cover over the quick-connects 7. ___ REMOVE the cart and move to the Turbine Building crane well 8. ___ UNBOLT CASB-5 from the cart using 3/4" wrench 9. ___ REMOVE T-handle operator 10. ___ GO TO Section 5.0 to prepare CASB-5 for shipment off-site _____/_____ Initial/Date

ACTIONS	DETAILS
4.5.14 INSTALL new Grab Sampler	1. ___ BOLT new Grab Sampler onto cart 2. ___ REMOVE transit cover 3. ___ ATTACH transit cover to lifting ring on grab sampler 4. ___ ATTACH T-handle operator to grab sampler 5. ___ OPEN CAV-492 using T-handle 6. ___ OPEN CAV-493 using T-handle 7. ___ PROCEED to sample station ********** **CAUTION: When connecting CASB-5, force should NEVER be used. Damage to quick connects will result from forcing connection.** ********** **NOTE: Repeated attempts may be necessary to successfully align CASB-5.** 8.___ ENGAGE Grab Sampler CASB-5 a.___One person GUIDE CASB-5 b.___Another person PUSH CASB-5 UP Ramp AND onto Platform, c.___HALT CASB-5 several inches from connection points **NOTE: WHEN positioned correctly, front of CASB-5 will make metal to metal contact with curved face of sample station.** d.___SLOWLY PUSH CASB-5 into Sample Station e.___ENGAGE Cart to Station Locking Mechanism f.___PUSH Locking Mechanism handle completely down, DRIVING lock bolt through hole in cart _____/_____ Initial/Date (Continued on next page)

ACTIONS	DETAILS
4.5.14 INSTALL new Grab Sampler (Cont'd)	********** **CAUTION: When engaging handle, force should NEVER be used. Damage to quick connects will result from forcing connection.** ********** **NOTE: Due to environmental conditions, the click may not be heard.** g.___GENTLY PULL Engagement Handle forward until a distinct "click" is heard. This signifies that quick connect couplings have engaged h.___ENSURE engagement: ___ UNLOCK Cart from station by pulling up on cart handle locking mechanism ___ MOVE engagement handle back and forth ___ IF properly connected, Cart will move back and forth i.___RE-LOCK Cart to Station by pushing locking mechanism handle completely down, driving lock bolt through hole in cart _____/_____ Initial/Date

4.6 DEMINERALIZED WATER FLUSH

ACTIONS		DETAILS
4.6.1	CLOSE Sample Isolation Valves	___ IF using the Primary Sample Path THEN NOTIFY Operations CLOSE the following: 1. ___ CAV-433 2. ___ CAV-435 ___ IF using the Alternate Sample Path, THEN NOTIFY Operations CLOSE the following: 1. ___CAV-434 2. ___CAV-436 **NOTE: CAV-500 is in the Intermediate Building.** ___ CLOSE CAV-500 _____/_____ Initial/Date

NOTE: Refer to Section 5.0 if a HI-HI alarm occurs at CAT-8.

4.6.2	ESTABLISH Demineralized Water Flow	1. ___ CLOSECAV-624 2. ___ OPEN DWV-337 3. ___ OPEN CAV-471 4. ___ START CAP-8 5. ___ THROTTLE CAV-624 to obtain flow, between 0.35-0.50 gpm on CA-74-FI **NOTE: While flushing you may continue with Steps 4.6.3 and 4.6.4.** ___ FLUSH system for at least 10 minutes _____/_____ Initial/Date

ACTIONS	DETAILS
4.6.3 A.I.M.S. Flushing Pre-Requisites	1. ___ VERIFY greater than 50 pounds of liquid nitrogen at PASS liquid nitrogen monitor 2. ___ ENSURE high voltage applied to the PASS detector at value specified in PASS AND RANGE AIMS Equipment Logbook ********** **CAUTION: Do not reset liquid nitrogen monitor until high voltage bias has been lowered to zero.** ********** 3. ___ ENSURE weekly calibration check performed within past seven days per CH-234 as indicated on weekly Count Room QC log sheet in Count Room Task Logbook _____/_____ Initial/Date

NOTE: ERASE cannot be performed from a remote terminal

4.6.4 PERFORM A.I.M.S. Flush	1. ___ LOG ON the VAX computer as Username: PASS 2. ___ SELECT PASS MENU 3. ___ ENTER NO to DO YOU WANT A SPECTRAL DISPLAY WINDOW? (Default) 4. ___ SELECT FLUSH SAMPLE LINES 5. ___ SELECT SUMP DEMIN FLUSH 6. ___ MAXIMIZE MCA Display 1 and toggle through ADC's until RCS CONFIGURATION shown 7. ___ SELECT the ERASE function on MCA Display to re-acquire spectrum 8. ___ When a low stable count rate is indicated MINIMIZE MCA Display 1 9. ___ SELECT RETURN 10. ___ DEPRESS PF4 to QUIT 11. ___ ENTER LO to log off _____/_____ Initial/Date

ACTIONS		DETAILS
4.6.5	SECURE Demineralized Water Flush	1. ___ STOP CAP-8 2. ___ CLOSE DWV-337 3. ___ CLOSE CAV-471 ENSURE CLOSED the following: 4. ___ CAV-519 5. ___ CAV-447 6. ___ CAV-623 7. ___ CAV-624 8. ___ CAV-625 9. ___ CAV-626 _____/_____ Initial/Date
4.6.6	CLOSE Containment Isolation Valves	NOTIFY Operations CLOSE the following: 1. ___ CAV-436 2. ___ CAV-434 **NOTE: CAV-500 is in the Intermediate Building** 3. ___ IF Alternate Sample Path was used, THEN CLOSE CAV-439 4. ENSURE CLOSED: ___ CAV-448 ___ CAV-500 _____/_____ Initial/Date

4.7 SYSTEM RESTORATION

ACTIONS	DETAILS
4.7.1 SECURE flow	ENSURE CLOSED the following: 1. ___ CAV-471 2. ___ CAV-447 3. ___ CAV-448 4. ___ CAV-484 5. ___ CAV-623 6. ___ CAV-624 7. ___ CAV-625 8. ___ CAV-626 9. ___ CAV-627 10. ___ CAV-519 11. ___ CAV-500 _____/_____ Initial/Date

5.0 CONTINGENCIES

5.1 SUSPECTED SAMPLE LINE BLOCKAGE

	ACTIONS	DETAILS
5.1.1	FLUSH sample line	IF sample flow can not be initiated due to suspected sample line blockage, THEN PERFORM demineralized water flush per Section 4.6. _____/_____ Initial/Date

5.2 HIGH RADIATION LEVELS IN SAMPLE LINES

5.2.1	FLUSH sample line	IF undesired radiation levels are reached in sample lines, THEN PERFORM demineralized water flush per Section 4.6. _____/_____ Initial/Date

5.3 CAT-8 HI-HI LEVEL ALARM

5.3.1	PERFORM lineup	ENSURE the following: 1. ___ CAP-10 OFF 2. ___ CAV-623 CLOSED 3. ___ CAV-627 CLOSED 4. ___ CONCURRENTLY PERFORM the HI-HI following until CAT-8 HI level alarm light clears: o DEPRESS and hold RESET button on Drain Tank level indicator o SELECT CAP-10 to ON 5. ___ OPEN CAV-623 6. ___ SELECT CAP-10 to AUTO 7. ___ RETURN to the step in the procedure which was in progress when the CAT-8 HI-HI level alarm occurred _____/_____ Initial/Date

5.4 NOTIFICATIONS AND SHIPMENT

ACTIONS	DETAILS

NOTE: The Emergency 24 hour access phone number is (800)-335-9264.

NOTE: Spare grab sample bombs are stored in the Oil Tank warehouse FIMIS # 1400513.

5.4.1 PERFORM notifications

___ NOTIFY the Manager, Nuclear Operations Materials Controls, that a grab sample has been taken and to initiate acquisition process for shielded sample cask

___ NOTIFY the BWX Technologies Emergency Sample Coordinator when a grab sample has been collected that will require offsite analysis

___ Required information to be made available:

- o Utility and plant name
- o Name and phone of ChemRad Specialist to whom follow-up communication should be addressed
- o Number and type of samples to be shipped (i.e., liquid, gaseous, or iodine cartridge)
- o Measured radiation levels at the surface and three feet from the shipping container
- o Estimated shipping time, mode of transportation, carrier, and estimated arrival at BWX Technologies site in Lynchburg, VA

Shipping Address:

BWX Technologies
Lynchburg Technology Center
Route 726, Mt. Athos Road
Lynchburg, VA 24506
Attn: Kenneth D. Long
(804) 522-5982

___ All data accumulated per this procedure is to be summarized on Enclosure 1 and forwarded to the Emergency Coordinator via Chemistry Supervision

_____/_____
Initial/Date

ENCLOSURE 1

TECHNICAL SUPPORT CENTER DATA SHEET

REACTOR BUILDING SUMP

Gamma Isotopic and/or Boron Analysis Results

Boron _____ ppm _____/_____/_____
Initial/ Date /Time

Boron _____ ppm _____/_____/_____
Initial/ Date /Time

Boron _____ ppm _____/_____/_____
Initial/ Date /Time

Boron _____ ppm _____/_____/_____
Initial/ Date /Time

Total Activity _____ uCi/cc

Major Contributing Isotopes

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____ _____ uCi/cc

_____/_____/_____
Initial/ Date /Time

ASSESSMENT OF CORE DAMAGE BASED ON REACTOR BUILDING SUMP SAMPLE

1. This method of confirming core damage assumes that releases from the core are uniformly mixed in the Reactor Building Sump Sample.

2. The baseline coolant concentrations in Table 1 are for 0.5 hour after shutdown of a core that has been through at least one refueling cycle.

3. The half-life of the fission products should be considered in analyzing samples.

4. Estimate a dilution factor based on the dilution volume from injection the Reactor Building Sump sample has been subjected to.

   _____ estimated dilution factor

5. Multiply the PASS Reactor Building Sump sample activities from Enclosure 1 by the estimated dilution factor from Step 4.

6. Compare these adjusted activities with the baseline coolant concentrations in Table 1. This table overestimates the concentration of the long-lived fission products (Cs and Sr) in a new core.

7. Determine the extent of core damage as indicated by Table 1 (i.e., normal, gas gap, core melt).

TABLE 1

BASELINE REACTOR COOLANT CONCENTRATION

Nuclide	Normal Concentration (uCi/g)	Concentration After Gap Release (uCi/g)	Concentration After Core Melt (uCi/g)	TMI Concentration + 48 Hours (uCi/g)
I-131	4E-2	2E4	1E5	1.3E4
I-133	1E-1	3E4	2E5	6.5E3
I-135	2E-1	3E4	2E5	No Data
Cs-134	7E-3	2E3	8E3	6.3E1
Cs-137	9E-3	9E2	5E3	2.8E2
Ba-140	No Data	No Data	3E4	No Data
Sr-90	1E-5	No Data	1E4	5.3

8. Report determination to Dose Assessment Coordinator.

   _____/_____
   Initial/Date

PROCEDURE DEVELOPMENT AND REVISION RECORD

Procedure: CH0632D **New Rev:** 4 **PRR#:** 17342

Title: POST ACCIDENT SAMPLING AND ANALYSIS OF THE REACTOR BUILDING SUMP

MINOR CHANGES

If Minor Changes are included, check the applicable box(es) and provide a list of affected steps.
The following corrections are incorporated throughout:

_ Sentence Structure

_ Punctuation

_ Abbreviations

_ Capitalization

_ Spelling

_ Inadvertently omitted symbols (#, %, etc.)

_ Organizational Changes: position titles, department names, or telephone numbers

_ Format

_ Redundant words or phrases

_ Obviously incorrect units of measure

_ Obvious step numbering discrepancies

The following corrections are incorporated in the step(s) indicated: "Throughout" is used in lieu of Step# if a specific change affects a large number of steps.

Correcting equipment nomenclature that does not agree with field labels or balance of procedure

---

Changing information that is obviously incorrect and referenced correctly elsewhere

---

Misplaced decimals that are neither setpoint values nor tolerances

---

Reference to a procedure when an approved procedure has taken the place of another procedure

---

Fixing branching points when it is clear the branching steps were originally intended but were overlooked or incorrectly stated due to step number changes

---

Adding clarifying information such as NOTES and CAUTIONS

Adding words to clarify steps, NOTES, or CAUTIONS which clearly do not change the methodology or intent of the steps

---

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_ Redundant words or phrases

Obviously incorrect units of measure

X Obvious step numbering discrepancies

The following corrections are incorporated in the step(s) indicated: "Throughout" is used in lieu of Step# if a specific change affects a large number of steps.

	Correcting equipment nomenclature that does not agree with field labels or balance of procedure
	Changing information that is obviously incorrect and referenced correctly elsewhere
	Misplaced decimals that are neither setpoint values nor tolerances
	Reference to a procedure when an approved procedure has taken the place of another procedure
	Fixing branching points when it is clear the branching steps were originally intended but were overlooked or incorrectly stated due to step number changes
5.4, 4.5	**Adding clarifying information such as NOTES and CAUTIONS**
	Adding words to clarify steps, NOTES, or CAUTIONS which clearly do not change the methodology or intent of the steps

PROCEDURE DEVELOPMENT AND REVISION RECORD

Procedure: **CH0632D** **New Rev:** **4** **PRR#:** **17342**

Title: **POST ACCIDENT SAMPLING AND ANALYSIS OF THE REACTOR BUILDING SUMP**

NON-INTENT CHANGES

Changes are incorporated for the reasons provided. "Throughout" is used in lieu of Step # if a specific change affects a large number of steps. For new or cancelled procedures the reason is provided.

3.2.1, 3.2.2, 4.1.1, 4.1.5, 4.1.3, 4.1.4	Clarify instructions.
Title Page	Add ID as EP implementing procedure
3.2.4	Correct dose limits to agree with pre-job briefing.