TO: USNRC NRR

VERMONT YANKEE CONTROLLED DOCUMENT TRANSMITTAL FORM

SECTION 1

DOCUMENT TITLE: IMPLEMENTING PROCEDURES TO THE E-PLAN

COPY NUMBER: 54

CHANGE NUMBER: #200

ISSUE DATE: April 17, 2002

INSTRUCTIONS:

a. Attached is an authorized controlled copy to the above listed document for retention as your assigned copy.

b. Review the revised material.

c. Incorporate new change into the controlled document by document issue date, if applicable.

d. Ensure that those who use the document are aware of the change.

e. Destroy all superseded pages.

f. Destroy obsolete forms and insert new forms into the files.

g. Sign and date this form and return to the Executive Secretary (ES) or Document Control Center (DCC).

h. Complete appropriate change information on VY Controlled Document Record of Changes.

TRANSMITTED BY: Diane Mehue
ES or DCC Signature

AFTER COMPLYING WITH THE ABOVE INSTRUCTIONS, PLEASE RETURN TO THE ES OR DCC WITHIN 10 DAYS OF THE ISSUE DATE.

SECTION 2

The undersigned acknowledges completion of the preceding instructions.

Signature of Recipient:_____ Date:_____

A045

Eplan Implementing Plant Procedures

To: Eplan Implementing Procedure Controlled Set Holders

From: Diane McCue

Date: 04/17/02

Re: VY EPlan Implementing Procedure Change #200, Instruction Sheet

---

A new Table of Contents is included.

REVISIONS:	Please replace the following procedures: -
Proc/Rev #	**Procedure Title**
OP 3524/18	Emergency Actions to Ensure Initial Accountability/Security Response
OP 3533/5	Post Accident Sampling of Reactor Coolant

Vermont Yankee Emergency Plan Implementing Procedures

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April 24, 2002

VERMONT YANKEE NUCLEAR POWER STATION

OPERATING PROCEDURE

OP 3524

REVISION 18

EMERGENCY ACTIONS TO ENSURE INITIAL ACCOUNTABILITY AND SECURITY RESPONSE

USE CLASSIFICATION: **REFERENCE**

LPC No.	Effective Date	Affected Pages

Implementation Statement: N/A

Issue Date: 04/24/2002

TABLE OF CONTENTS

PURPOSE

To define necessary actions by members of the security force, in conjunction with plant personnel, during emergency conditions at Vermont Yankee Nuclear Power Station.

DISCUSSION

Under emergency conditions, the security force functions are to aid the Plant Emergency Director (Operations Shift Supervisor) and the Technical Support Center (TSC) Coordinator by providing supplemental security staff, providing pertinent information, regulating access to the site, and performing security functions as deemed necessary. Plant personnel are responsible for reporting to appropriate areas and aiding security in the accountability process.

Vermont Yankee personnel and contractors working within the Plant Support Building and Gate 3, located in the Owner Controlled Area (OCA), are required to attend OCA training and are exempt from having to wear a Vermont Yankee OCA Unescorted Access Badge. Visitors to the Plant Support Building or Gate 3 require escort by an individual with current training for OCA unescorted access and are not required to wear an OCA Visitor's Badge.

In cases of an Emergency Plan drill or actual event, individuals within the Plant Support Building and Gate 3 shall follow the procedures presented during OCA training.

ATTACHMENTS

1.	VYOPF 3524.01	Initial Accountability Report Form
2.	VYOPF 3524.02	Initial Accountability Check-In Form
3.	Figure 1	Hallway Outside Control Room Map
4.	Figure 2	Technical Support Center (TSC) Layout
5.	Figure 3	Operations Support Center (OSC) Layout
6.	Figure 4	Condenser Bay - Ground Floor

REFERENCES

1. Technical Specifications and Site Documents

   a. None

2. Codes, Standards, and Regulations

   a. None

3. Commitments

   a. None

4. Supplemental References

a. OP 3510, Off-Site and Site Boundary Monitoring
b. OP 3540, Control Room Actions During an Emergency
c. OP 3541, Activation of the Technical Support Center
d. OP 3542, Operation of the Technical Support Center
e. OP 3544, Operation of the Operations Support Center
f. OP 3545, Activation of the Emergency Operations Facility/Recovery Center
g. OP 3546, Operation of the Emergency Operations Facility/Recovery Center
h. OP 3547, Security Actions During an Emergency
i. AP 6807, Collection, Temporary Storage and Retrieval of QA Records

DEFINITIONS

1. Normal Hours: Periods of time when sufficient personnel are on-site to activate the Technical Support Center (TSC) within a short period of time.

2. Off-Normal Hours: Periods of time when personnel needed to activate the TSC will be responding from off-site.

PROCEDURE

I. Personnel Evacuation in the Event of an Alert

On notification of an Alert condition by alarm or verbal report, the following actions shall be taken to ensure personnel (including contractors and visitors) site evacuation:

A. Plant emergency response personnel shall:

1. without delay, proceed to the plant Administration Building and report, as required, to the TSC or OSC,

2. upon arrival, promptly check in using VYOPF 3524.02 where indicated,

3. take actions as required by their duty assignment.

NOTES

- Plant workers and contractors should hang their Dositec (if any) along with their TLD on the dosimetry rack in Gatehouse 2. Visitors should turn in Dositecs (if any), clipped together with their visitor's badge and TLD, to the Access Control Officer (ACO) or as directed.
- During emergency evacuation periods due to a declared event, the portal monitor at Gatehouse 2 may be bypassed per DP 4532.

B. All personnel assigned to the EOF shall:

1. without delay, proceed to Gatehouse 2 and leave the Protected Area (PA) as normal,

2. travel to the EOF and, upon arrival, promptly check in at the front desk of the Training Center.

C. All unassigned individuals (plant personnel, contractors, and visitors) shall:

1. without delay, proceed to Gatehouse 2 and leave the Protected Area (PA) as normal,

2. walk to the Governor Hunt House (GHH) and await further instructions.

D. Security Shift Supervisor(s) (SSS) shall, as necessary:

1. supplement security shift staffing,

2. request local law enforcement support.

II. Initial Personnel Accountability in the Event of an Alert

On notification of an Alert condition by alarm or verbal report, actions shall be taken to ensure personnel (including contractors and visitors) accountability. The accountability process to be used will be determined by activation of the TSC during normal or off-normal hours.

A. During normal hours:

1. The Access Control Officer (ACO) shall direct security personnel to:

a. ensure that all evacuating personnel deposit their identification badges and card keys in the proper collection slots and promptly exit the Gatehouse,

b. immediately return all identification badges and card keys to their proper slots in the badge rack,

c. obtain an On-Site report from the security computer when personnel have evacuated the Protected Area (PA), inventory the Owner Controlled Area (OCA) badge rack, as well as the Visitor's Log,

d. initiate VYOPF 3524.01.

NOTE

The ACO shall contact the TSC to ascertain the status of the VYOPF 3524.02 forms (check-in sheets) if they are not delivered following the evacuation of personnel.

2. The TSC Coordinator shall designate Accountability Coordinators to:

a. ensure all personnel reporting to the TSC and OSC check in on VYOPF 3524.02,

b. promptly deliver completed VYOPF 3524.02 forms to the ACO at Gatehouse 2,

c. activate accountability posts to monitor all personnel entering/exiting the emergency response facilities located in the Administration Building, using VYOPF 3542.01.

3. The ACO shall:

   a. assign an individual to read off the gatehouse slot number and name, in that order, from the VYOPF 3524.02's, the OCA badge rack and the Visitor's Log, if applicable,

   b. check off the corresponding gatehouse slot number and name on the On-Site computer report,

   c. when complete, verify that badges assigned to those personnel not checked-off on the On-Site computer report are not in the badge and OCA rack, or in the deposit slots,

NOTE

Should an individual incorrectly note their slot number or a printed name is illegible, a cross-reference may be obtained using the current Employee Card Key Inventory List maintained at the ACO's desk.

   d. list personnel not checked off on the On-Site computer report as unaccounted for on VYOPF 3524.01,

   e. report the status of the accountability process to the TSC and the name(s) of any unaccounted for personnel, within 30 minutes of the announcement of the emergency classification,

NOTE

If the process is not complete at the time of this report another notification to the TSC is required upon completion.

   f. place colored pegs in the badge rack slots indicating those personnel unaccounted for.

4. When an On-Site computer report is not available, the ACO shall:

   a. ensure that all personnel deposit their identification badges and card keys in the proper collection slots and promptly exit the Gatehouse,

   b. immediately return all identification badges and card keys to their proper slots in the badge rack,

   c. initiate VYOPF 3524.01,

NOTE

The ACO shall contact the TSC to ascertain the status of the VYOPF 3524.02's (check-in sheets) if they are not delivered following the evacuation of personnel.

d. following site evacuation numerically inventory by slot number the empty slots in the identification badge rack, the OCA badge rack and the Visitor's Log, if applicable,

NOTE

During the time after the inventory list is compiled and before the process is complete, individuals who leave site must be deleted from the list in order to avoid appearing unaccounted for.

e. assign an individual to read off the gatehouse slot number and name from the VYOPF 3524.02's, the OCA badge rack, as well as the Visitor's Log, if applicable,

f. check-off the corresponding gatehouse slot number on the inventory list compiled in step 4.d.,

g. when complete, verify that badges assigned to those personnel not checked off on the inventory list are not in the badge and OCA rack or in the deposit slots,

NOTE

Should an individual incorrectly note their slot number or a printed name is illegible, a cross-reference may be obtained using the current Employee Card Key Inventory List maintained at the ACO's desk.

h. list personnel not checked off as unaccounted for on VYOPF 3524.01,

i. report the status of the accountability process to the TSC, and the name(s) of any unaccounted for personnel, within 30 minutes of the announcement of the emergency classification.

NOTE

If the process is not complete at the time of this report another notification to the TSC is required upon completion.

5. The TSC, on notification of unaccounted for personnel, shall designate personnel to:

   a. page the unaccounted for individual(s) in an attempt to locate them,

NOTE

Whenever possible an Armed Security Officer should be assigned as a member of the search and rescue team.

   b. as necessary, dispatch an on-site search and rescue team to locate the individual(s),

   c. inform the ACO when the individual is located.

6. The ACO shall:

   a. delete the individual from VYOPF 3524.01 as appropriate,

   b. remove the colored peg from the individual's badge rack slot.

B. During off-normal hours:

1. the ACO shall direct security personnel to:

   a. ensure that all evacuating personnel deposit their identification badges and card keys in the proper collection slots and promptly exit the Gatehouse,

   b. immediately return all identification badges and card keys to their proper slots in the badge rack,

   c. obtain an On-Site report from the security computer when personnel have evacuated the PA, inventory the OCA badge rack and Visitor's Log, if applicable,

NOTE

If an On-Site report from the security computer is unavailable, perform accountability in accordance with step A.4.

d. initiate VYOPF 3524.01,

e. verify the well-being and accountability of each individual listed on the On-Site report, by contacting the senior supervisor for each department currently on site,

NOTE

If there is someone listed as on-site who cannot be accounted for by a supervisor, they will need to be located individually via Gai-Tronics or other means.

f. check off the corresponding name and slot number on the On-Site report,

g. note on the On-Site report the name(s) of the supervisors verifying well-being,

h. when complete, verify that badges assigned to those personnel not checked off on the On-Site report are not in the badge and OCA rack or in the deposit slots,

i. list them as unaccounted for on VYOPF 3524.01,

j. report the status of the accountability process to the Operations Shift Supervisor (OSS), and the name(s) of any unaccounted for personnel, within 30 minutes of the announcement of the emergency classification,

k. place colored pegs in the badge rack slots indicating those personnel unaccounted for.

2. The OSS, on notification of unaccounted for personnel, shall designate personnel to:

a. page the unaccounted for individual(s) in an attempt to locate them,

NOTE

Whenever possible an Armed Security Officer should be assigned as a member of the search and rescue team.

b. as necessary, dispatch an on-site search and rescue team to locate the individual(s),

c. inform the ACO when the individual is located.

3. The ACO shall:

a. delete the individual from VYOPF 3524.01 as appropriate,

b. remove the colored peg from the individual's badge rack slot.

III. Additional Security Force Functions in the Event of an Alert

On notification of an Alert condition by alarm or verbal report, the following actions shall be taken by the security force:

A. Site Access Control

1. The Gatehouse 1 security officer(s) shall:

a. as necessary, direct personnel to the GHH,

NOTE

Personnel responding to the Emergency Operations Facility (EOF) at Brattleboro will be allowed to leave site.

b. control access to the plant site to ensure that only those persons and vehicles authorized by the TSC Coordinator, OSC Coordinator or Plant Emergency Director (OSS) are allowed to enter the plant site (the ACO will be the point of contact),

c. direct any emergency response vehicles to proceed to the Gatehouse 2 parking lot,

d. direct all other incoming vehicles as normal unless otherwise directed by the TSC Coordinator or Plant Emergency Director,

e. ensure that the site access road is not obstructed to prevent personnel evacuation or passage of emergency equipment.

2. The Gatehouse 2 Access Control Officer shall:

a. ensure that all personnel entering the PA have been authorized by the TSC Coordinator,

b. ensure that all personnel entering the site enter through the Administration Building main west entry (lobby entry).

B. Posting of Signs at the Emergency Response Facility

1. The Security Shift Supervisor (SSS) shall dispatch a security officer(s) to post "Accountability Control" signs on doors which form the boundary of the facility.

2. The security officer(s) shall post signs on all doors shown on Figures 1, 2, and 3.

C. Posting of CO_2 Hazard Signs

1. When directed by the Fire Brigade Commander, the SSS shall dispatch a security officer(s) to post "CO_2 Hazard" signs on the doors indicated in Figures 1 through 4.

2. The security officer(s) shall post the signs on the doors indicated on Figures 1 through 4.

IV. Personnel Evacuation in the Event of a Site Area Emergency or General Emergency Which Has Not Been Preceded by the Declaration of an Alert

The following actions shall be taken to ensure personnel (including contractors and visitors) site evacuation:

A. Any personnel exiting a known contamination area shall report to the Radiation Protection Control Point to be monitored and receive further instructions from Radiation Protection personnel.

B. Plant emergency response personnel shall take actions as previously described in the Alert notification and required by their duty assignment.

C. All other plant personnel shall evacuate the site as follows:

1. Without delay, proceed to Gatehouse 2 (PA gatehouse), place dosimetry (to include Dositec, if any) in the appropriate slot in the dosimetry rack, and leave the PA as normal.

2. Exchange their VY identification badge (and card key) for a VY "EMPLOYEE EXIT PASS." A security officer will be stationed at the gatehouse exit turnstiles to ensure badges are placed in the proper collection slots and exit passes issued.

3. Proceed to Gatehouse 1 (OCA gatehouse) and hand the "EXIT PASS" to the security officer at the gatehouse.

4. Proceed to the Emergency Operations Facility/Recovery Center (EOF/RC) unless assigned for duty at the Governor Hunt House.

D. Contractor employees and visitors shall evacuate the site as follows:

NOTE

If a visitor has been issued dosimetry, he/she will be instructed to clip the badge and dosimetry together and hand it to the security officer stationed at the gatehouse exit turnstiles.

1. Without delay, proceed to Gatehouse 2 (PA gatehouse), place dosimetry (to include Dositec, if any) in the appropriate slot in the dosimetry rack, and leave the PA as normal.

NOTE

Any contractor or visitor who is found to be contaminated shall be directed by the Governor Hunt House monitoring team to proceed to the EOF/RC.

2. Walk to the Governor Hunt House to be frisked by the Governor Hunt House monitoring team. After being frisked, each contractor or visitor shall be given a "CONTRACTOR EXIT PASS."

3. Retrieve their vehicle from the parking lot, hand their "EXIT PASS" to the security officer at Gatehouse 1 and leave site.

V. Personnel Accountability in the Event of a Site Area Emergency or General Emergency, Not Preceded by the Declaration of an Alert
(See Section I - Shall be the same as in the Alert notification.)

VI. Additional Security Force Functions in the Event of a Site Area Emergency or General Emergency Not Preceded by the Declaration of an Alert

The following actions shall be taken by the security force.

A. Site Access Control

1. The Gatehouse 1 Security Officer(s) shall:

a. as necessary, direct personnel to the GHH such that no contractor personnel or visitors leave without first being frisked by the Governor Hunt House monitoring team,

b. control access to the plant site to ensure that only those persons and vehicles authorized by the TSC Coordinator, OSC Coordinator or Plant Emergency Director (OSS) are allowed to enter the plant site, (the ACO will be the point of contact),

c. direct any emergency response vehicles to proceed to the Gatehouse 2 parking lot,

d. direct all other incoming vehicles as normal unless otherwise directed by the TSC Coordinator or Plant Emergency Director,

e. ensure that the site access road is not obstructed to prevent personnel evacuation or passage of emergency equipment.

2. The ACO shall:

a. ensure that all personnel entering the plant Protected Area have been authorized by the TSC Coordinator,

b. ensure that all personnel entering the site enter through the Administration Building main west entry (lobby entry).

B. Posting of Signs at the Emergency Response Facilities

1. The SSS shall dispatch a security officer(s) to post "Accountability Control" signs on doors which form the boundary of the facility.

2. The security officer(s) shall post signs in all doors shown on Figures 1, 2, and 3.

VII. Other Security Force Functions in the Event of an Emergency (Alert, Site Area or General)

The following additional actions shall be taken by the security force:

A. Site Boundary Radiological Survey. If the SSS is notified of the need to perform a site radiological survey:

1. contact the Control Room and request the following information:

a. Downwind direction.

b. Type of release (elevated or ground).

2. dispatch a Security Survey Team to the requested location. The Security Survey Team shall:

a. obtain equipment in accordance with OP 3510,

b. report to the assigned location,

c. perform a survey in accordance with the provisions of OP 3510,

d. report the results of the survey to the TSC (if it is manned) or the Control Room.

B. Issue of Controlled Keys. The SSS shall:

1. issue keys from the emergency key repository as requested by the Operations Support Center Coordinator. This could include issue of Emergency Key Rings which contain the master keys for Vital Areas, Protected Areas and Radiation Areas,

2. log the issue and return of the keys on the SSS key control log.

C. Evacuation Assistance: As requested, security force members shall provide directions to Gatehouse 1, the Governor Hunt House, or EOF/RC at Brattleboro.

D. Protected Area Access Control: The security force shall adhere to all normal PA access control requirements (search, authorization, etc.) except Plant personnel dispatched by the TSC or OSC to work in the OCA shall retain their dosimetry.

E. Status of Security Systems and Security Force. The SSS shall:

1. report the status of plant security, perimeter integrity, location of security personnel, number of persons on-site, etc., as requested by the TSC Coordinator or Plant Emergency Director,

2. ensure that all required security force emergency functions are completed,

3. notify the Security Operations Supervisor and Security Manager in the event of an emergency situation.

VIII. Criteria for Evacuation of Gatehouse 2

A. During a Site Area Emergency or General Emergency it may become necessary to evacuate Gatehouse 2 due to habitability concerns.

B. On notification by the TSC Coordinator of the need to evacuate Gatehouse 2, the Security Manager shall:

1. assess relocation alternatives with the TSC Coordinator,

2. develop a plan for the relocation of security personnel and equipment,

3. determine necessary compensatory measures and actions as a result of the relocation.

FINAL CONDITIONS

1. Return emergency equipment to normal location at Gatehouse 2.

2. Return all completed forms to the Emergency Plan Coordinator who will ensure proper filing in accordance with AP 6807.

INITIAL ACCOUNTABILITY REPORT FORM

I. Date:_____ II. Time Event Initiated:_____

III. Names of Individuals Unaccounted For: (if none, leave blank)

IV. Time Completed:_____

Time TSC or CR Contacted:_____

_____

Access Control Officer (Print/Sign)

INITIAL SITE ACCOUNTABILITY CHECK-IN FORM

FOR TECHNICAL SUPPORT CENTER RESPONSE PERSONNEL

DATE: _____

POSITION	GATEHOUSE SLOT NO.	PLEASE PRINT NAME CLEARLY	DEPT.
TECHNICAL SUPPORT CENTER COORDINATOR			
SECURITY COORDINATOR			
MAINTENANCE COORDINATOR			
ENGINEERING COORDINATOR			
REACTOR ENGINEERING COORDINATOR			
OPERATIONS COORDINATOR			
RADIATION PROTECTION COORDINATOR			
CHEMISTRY COORDINATOR			
TECHNICAL SUPPORT SERVICES COORDINATOR			
G.E. ENGINEER (WHEN AVAILABLE)			
DOC. & ADMIN. SERVICES COORDINATOR			
DECISION MAKER			

INITIAL SITE ACCOUNTABILITY CHECK-IN FORM (Continued)

FOR TECHNICAL SUPPORT CENTER AND OPERATIONS SUPPORT CENTER RESPONSE PERSONNEL

DATE: _____

GATEHOUSE SLOT NO.	PLEASE PRINT NAME CLEARLY	DEPT./POSITION

INITIAL SITE ACCOUNTABILITY CHECK-IN FORM (Continued)

FOR EMERGENCY RESPONSE PERSONNEL

DATE: _____

GATEHOUSE SLOT NO.	PLEASE PRINT NAME CLEARLY	DEPT./POSITION

FIGURE 1

HALLWAY OUTSIDE CONTROL ROOM MAP

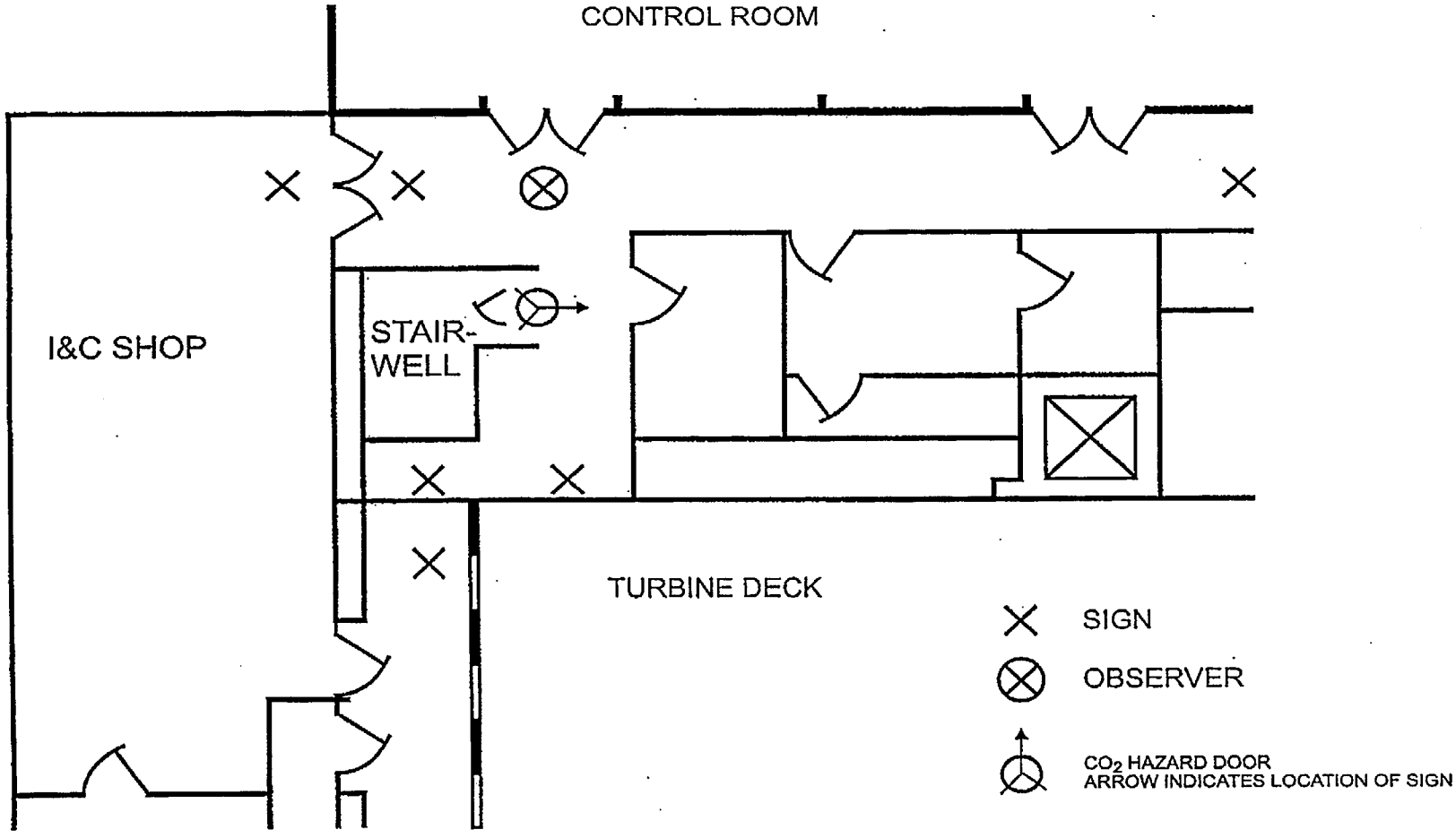
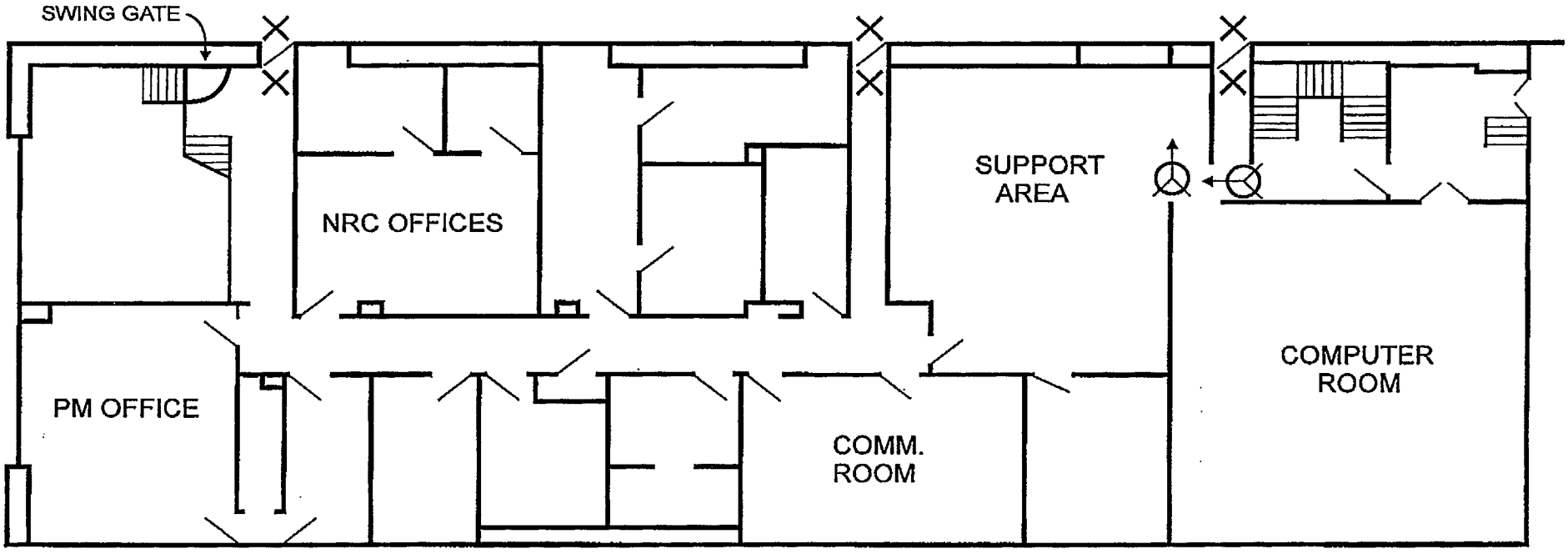


FIGURE 2

TECHNICAL SUPPORT CENTER LAYOUT



SIGN

CO_2 HAZARD DOOR
ARROW INDICATES LOCATION OF SIGN

SWING GATE

FIGURE 3

OPERATIONS SUPPORT CENTER LAYOUT

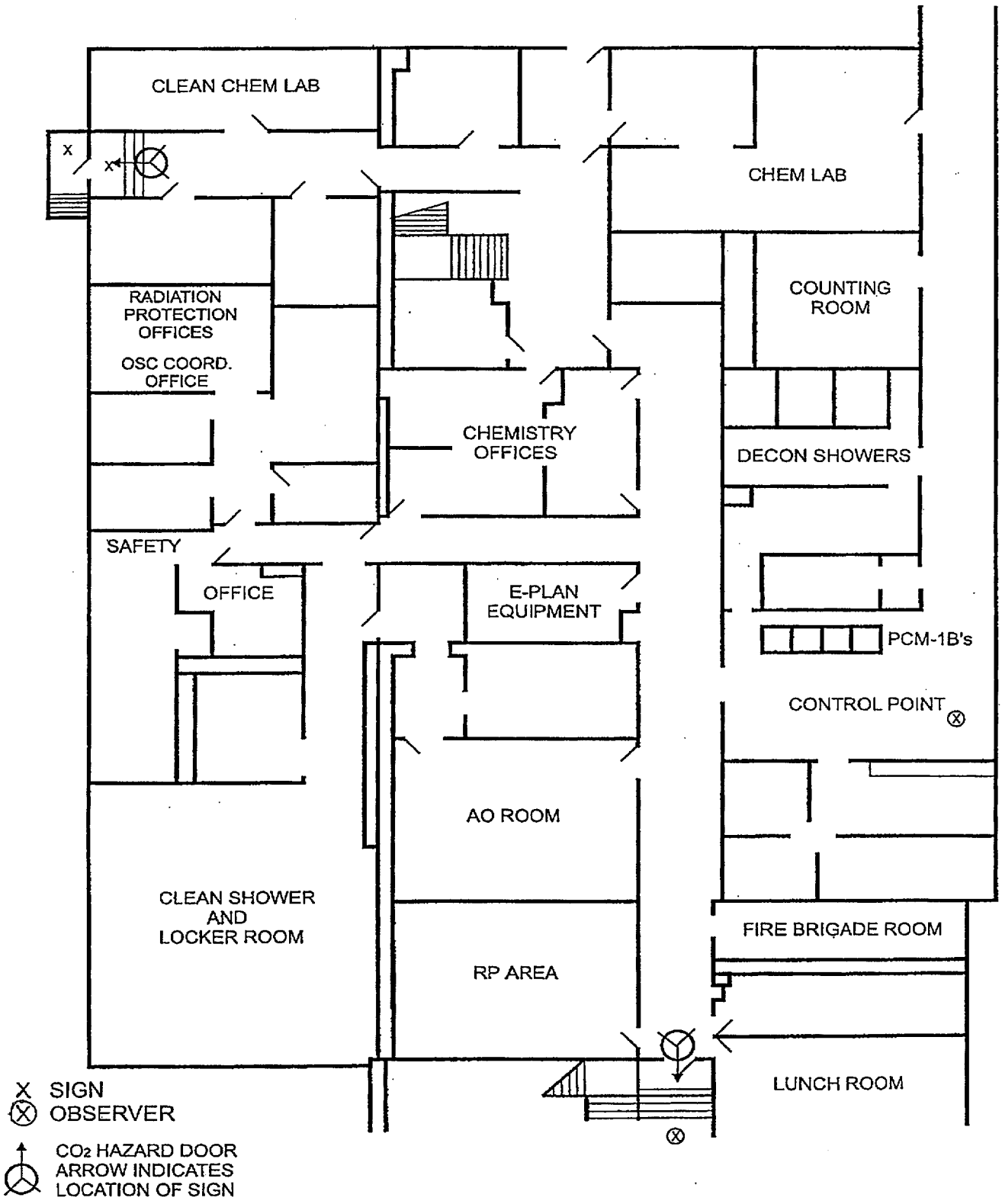
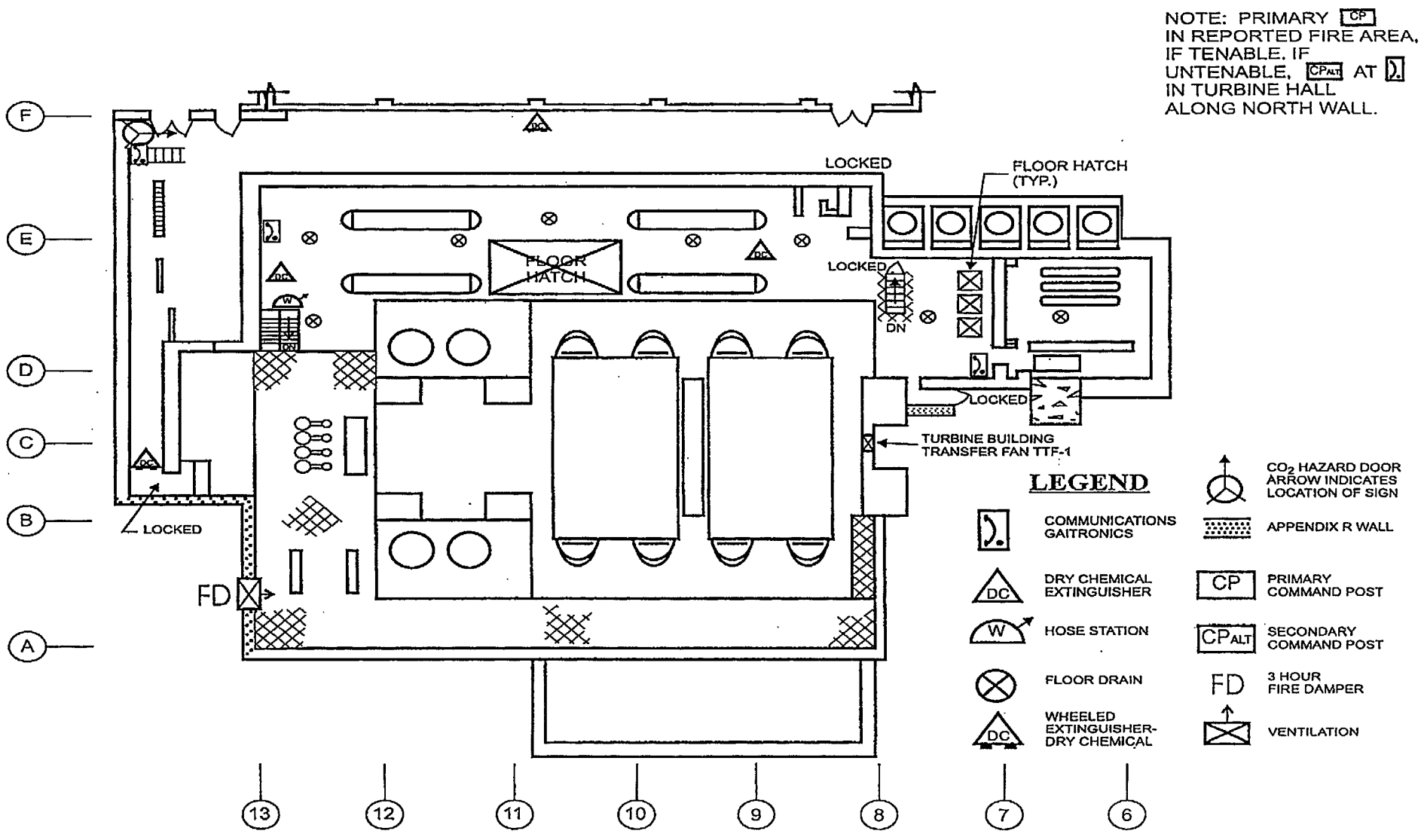


FIGURE 4

CONDENSER BAY – GROUND FLOOR
ELEVATION 248' –6"



VERMONT YANKEE NUCLEAR POWER STATION

OPERATING PROCEDURE

OP 3533

REVISION 5

POST ACCIDENT SAMPLING OF REACTOR COOLANT

USE CLASSIFICATION: **CONTINUOUS**

LPC No.	Effective Date	Affected Pages

Implementation Statement: N/A

Issue Date: 04/24/2002

TABLE OF CONTENTS

PURPOSE

To outline the special procedures necessary to collect and handle samples, perform analyses and interpret results during post accident conditions.

Primary containment integrity issues are addressed in Technical Specifications section 3.7.

The use classification of this procedure is **Continuous Use**. However, each Appendix may be used individually and the entire procedure does not need to be in hand.

DISCUSSION

Post accident sampling and analysis of reactor coolant is performed to provide information on the nature and extent of fuel damage, boron concentration following SLC injection and damage information on other in-core components such as control rods. NUREG-0737 requires a combined time of 3 hours or less for sampling and selected analyses from the time the decisions is made to collect a sample (TSC).

During post accident conditions, samples of reactor coolant may be highly radioactive. Because of the high radiation levels, these samples require special handling. This procedure outlines the special handling required. The Chemistry Manager is assigned responsibility for implementation of this procedure.

In addition to the above concerns, conductivity readings of the reactor coolant may be useful during an accident. Readings can be obtained in the Control Room up to 10 μmho/cm; if exceeded, conductivity readings may be taken at a later date at the discretion of the Chemistry Manager.

During certain postulated accidents, the availability of on-site counting equipment may be compromised. In these instances, post accident samples may be counted at alternative laboratories. A determination will be made by the Operations Support Center Coordinator's Assistant, in conjunction with the Radiological Assistant at the Emergency Operations Facility/Recovery Center, as to the most appropriate alternative laboratory facility to be used, based on existing conditions.

Tables 1, 2, 3 and 4 are provided for use by the OSC Coordinator's Assistant and the sampling and analysis teams in their evaluation of sampling conditions prior to obtaining the isotopic results after analysis. The information contained in these tables is generated from design basis accident assumptions and this fact should be taken into account in the use of these tables.

VYOPF 3533.02, Sample Accountability Log shall be utilized to track the location of emergency samples collected in accordance with this procedure.

In accordance with AP 6002, Preparing 50.59 Evaluations, the results of an Applicability Determination (AD) has determined that an AD is not required for future changes provided the procedure scope is not changed. The basis for this conclusion is that this document is an Emergency Implementing Procedure and is subject to 10CFR50.54(q) to determine if the changes decrease the effectiveness of the Emergency Plan and if they have the potential to affect our ability to meet the standards of 10CFR50.47(b) and the requirements of 10CFR50 Appendix E.

ATTACHMENTS

1.	Figure 1	Post Accident Sampler
2.	Figure 2	Post Accident Sampling System
3.	VYOPF 3533.01	Reactor Coolant Post Accident Sampling Data/Analysis
4.	VYOPF 3533.02	RV PASS Sample Accountability Log
5.	Appendix A	Reactor Coolant Sampling and Analysis - RB 303' Sample Sink
6.	Appendix B	Operation of the PASS to Sample Reactor Coolant
7.	Appendix C	Flushing and Restoring the PASS Following Use
8.	Appendix D	PASS Sample Analysis
9.	Appendix E	Deleted
10.	Table 1	VY Radioactivity Concentration (μCi/g) in Reactor Coolant Based on Design Basis Source Term (100/50/1)
11.	Table 2	VY Dose Rates (R/hr) at Different Sampling Stations at Different Times After Shutdown
12.	Table 3	VY Reactor Coolant and Containment Air Samples Dose Rates (R/hr) at Different Times After Shutdown
13.	Table 4	VY Reactor Coolant and Containment Air Samples Dose Rates (R/hr) at Different Times after Shutdown

REFERENCES AND COMMITMENTS

1. Technical Specifications and Site Documents

   a. TS 3.7
   b. UFSAR, Section 10.20

2. Codes, Standards, and Regulations

   a. NUREG 0737, Sec. II.B.3

3. Commitments

   a. None

4. Supplemental References

   a. EDCR 97-407 on FCV-39 and FCV-40
   b. OP 0630, Water Chemistry
   c. OP 0634, Operation of the Dionex Ion Chromatograph
   d. DP 2630, Analytical Instrumentation
   e. DP 2631, Radiochemical Instrumentation
   f. OP 3506, Emergency Equipment Readiness Check
   g. OP 4612, Sampling and Treatment of the Reactor Water System
   h. AP 6807, Collection, Temporary Storage and Retrieval of QA Records

PRECAUTIONS/LIMITATIONS

1. During sampling, communications should be maintained using either a portable radio or a Gai-Tronics.

2. High levels of Kr^{88} may cause an interference with I^{131} identification. If this is suspected, purge sample if possible or count sample again at a later time.

3. Be aware of the radiological concerns and RWP requirements. Dose rates during sampling could increase rapidly.

PREREQUISITES

1. Post accident sampling equipment and tools, as needed.

2. Dose rate meter.

3. Evaluate with RP whether or not respiratory protection should be worn during sampling.

4. Evaluate with RP whether or not extremity dosimetry and high range pocket dosimeters should be worn during sampling.

5. Maximum Dose Rate and Dose commitment limits have been established, if needed, and should be adhered to for all Post Accident Sampling. Consult with the OSC Coordinator for specific instructions. Tables 3 and 4 should be consulted by the OSC Coordinator and sample team members for information concerning expected dose rates.

PROCEDURE

A. Reactor Coolant Sampling and Analysis - RB 303' Sample Sink

> **NOTE**
>
> Sampling the reactor coolant at the RB 303' sample sink is only allowed if the Reactor Building is accessible with acceptable dose rates. If the RB is not accessible, sample the Reactor Coolant at the PASS panel per Appendix B of this procedure.

1. Utilize Appendix A to sample and analyze the Reactor Coolant via the RB 303' sample sink.

B. Operation of the PASS to Sample Reactor Coolant

> **NOTE**
>
> Chemistry Emergency Equipment Readiness Check is maintained per VYOPF 3506.05.

1. Utilize Appendix B to sample the Reactor Coolant via the PASS Panel.

C. Flushing and Restoring the PASS Following Use

1. Utilize Appendix C to flush and restore the PASS Panel following use.

D. PASS Sample Analysis

1. Utilize Appendix D to analyze the PASS liquid and gas samples.
2. Make a copy of VYOPF 3533.01 and any printouts and retain for filing.
3. Submit original VYOPF 3533.01 and printouts to the OSC Coordinator or OSC Assistant.

FINAL CONDITIONS

1. Submit all forms for review and filing as per AP 6807.
2. Report all results to the OSC Coordinator or Assistant.
3. If any portion of the PASS Panel is found to be inoperable, submit a high priority Work Request.

FIGURE 1

POST ACCIDENT SAMPLER

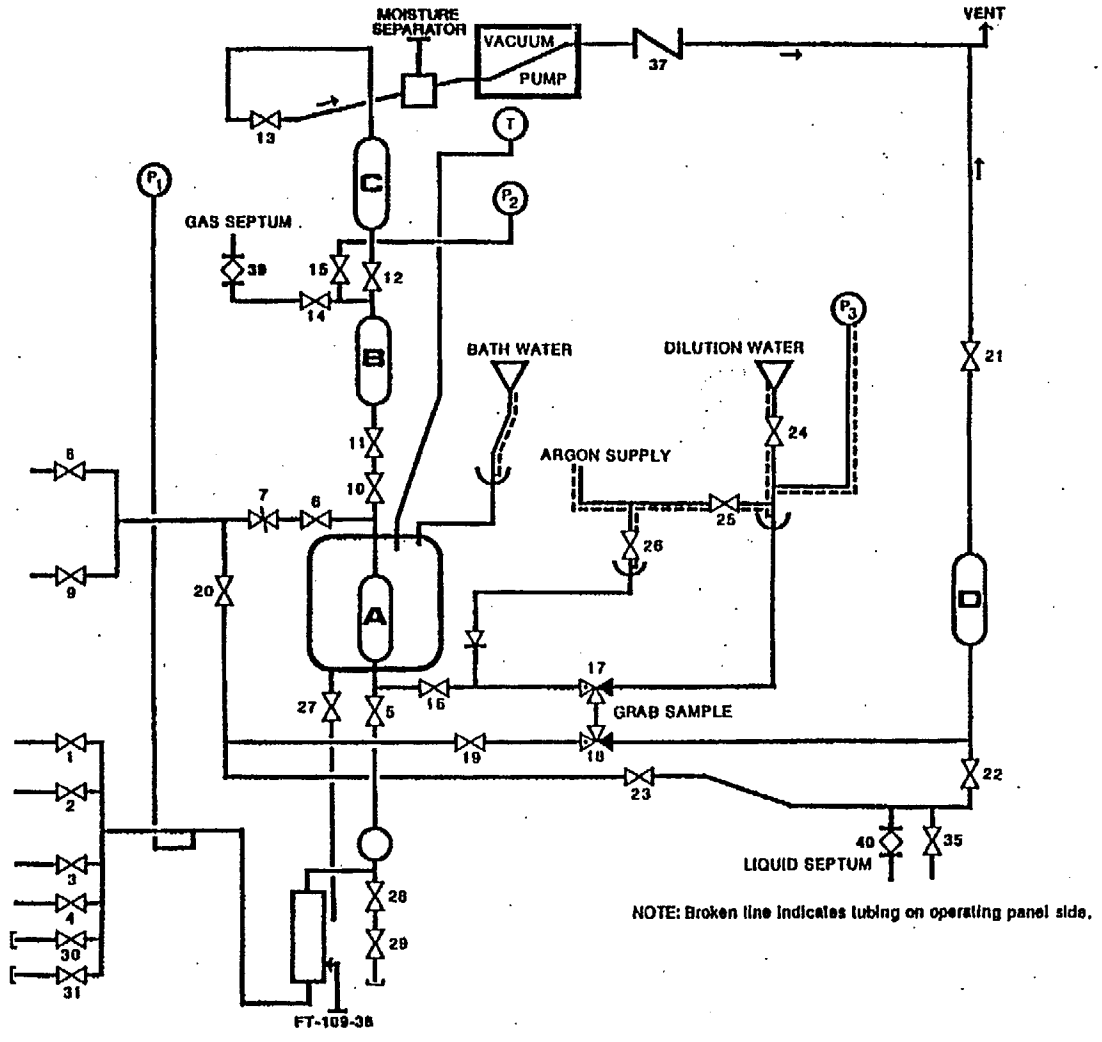
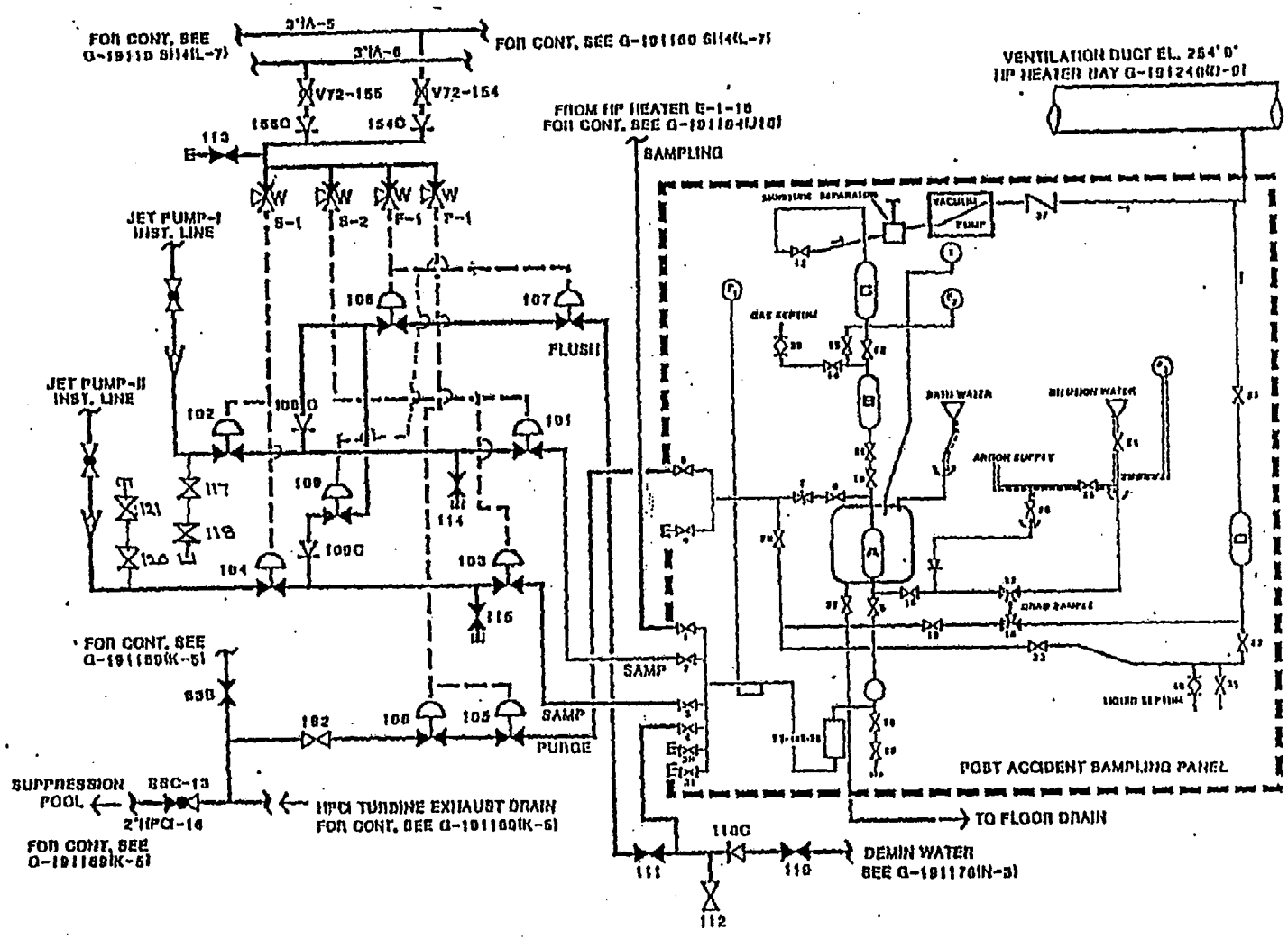


FIGURE 2

POST ACCIDENT SAMPLING SYSTEM



REACTOR COOLANT PASS DATA/ANALYSIS
(For Use with Appendix B and D)

SAMPLE DATA: Date _____ Time _____ By _____

DILUTION WATER VOL: _____ ml

GAS: High (Cyl B and C) OR Low Activity (Cyl B) (CIRCLE ONE)

****

I. GASEOUS Analyses from PASS RV System:

A. Gas Sample correction factor when diluting with carrier gas (CIRCLE ONE):

1. If App. B. Step F.3.a.1) is performed (high activity, Cyl B and C) CF=29

OR

2. If App. B. Step F.3.a.2) is performed (low activity, Cyl B only) CF=7.2

BASIS: $\frac{Vol_B + Vol_C}{Mass_A} = CF$

Vol_B = 329 cc
Vol_C = 1005 cc
$Mass_A$ = 46 g

B. Hydrogen Concentration

Input Needed:
1) Hydrogen concentration (from analysis as decimal) _____H_2conc
2) Gas Sample CF (from I.A) _____CF

1. Calculate H_2 concentration in Reactor Coolant:

14* X H_2conc X CF = Coolant Hydrogen Concentration in Coolant

*14 = volume of offgas vial in cc

_____ X _____ X _____ = _____ cc H_2 per g. Rx Coolant

2. Attach chromatograph to this form.

C. Oxygen Concentration

Input Needed:
1) Oxygen concentration (from analysis as decimal) _____O2conc
2) Gas Sample CF (from I.A) _____CF

1. Calculate O2 concentration in Reactor Coolant:

14* X O_2conc X CF = Coolant Oxygen Concentration in Coolant

*14 = volume of offgas vial in cc

_____ X _____ X _____ = _____ cc O2 per g. Rx Coolant

2. Attach chromatograph to this form.

D. GASEOUS Isotopic Analysis

Input Needed: 1) Gas Sample CF (from I.A) _____CF

1. Calculate volume of gas to be analyzed on MCA:

$\frac{1}{CF \times 14}$ = _____ cc (enter as MCA sample volume)

2. Attach isotopic printout to this form. Results are µCi/cc of gas per gram of Rx coolant.

II. LIQUID Analyses from PASS RV System:

A. Calculate sample PASS Dilution factor (DF_{Pass}):

Input Needed: PASS Dilution Water volume _____VDIL ml

$\frac{V_{DIL}}{0.5\ ml} = DF_{Pass}$ $\frac{\_\_\_\_\_}{0.5} =$ _____ DF_{Pass}

B. Chloride Concentration

NOTE

A lab dilution may be required for this analysis due to the small initial sample size.

1. Calculate lab dilution factor (DF_{Lab}):

$DF_{Lab} = \frac{\text{Final Volume (ml)}}{\text{Aliquot (ml)}}$ $\frac{\_\_\_\_\_\ (ml)}{(ml)} =$ _____ DF_{Lab}

2. Analyze sample with IC.

3. Calculate chloride concentration in coolant:

Input needed: DF_{Pass} from II.A. and analysis result.

Analysis (ppb) X DF_{Pass} X DF_{Lab} = Coolant Cl^- (ppb)

_____ ppb X _____ X _____ = _____ ppb coolant Cl^-
(analysis)

4. Attach any chromatograph to this form.

C. Boron Concentration

NOTE

A lab dilution may be required for this analysis due to the small initial sample size.

1. Calculate lab dilution factor (DF_{Lab}):

$DF_{Lab} = \frac{\text{Final Volume (ml)}}{\text{Aliquot (ml)}}$ $\frac{\_\_\_\_\_\ (ml)}{(ml)} =$ _____ DF_{Lab}

2. Analyze sample with ICP or Titration (circle one).

3. Calculate BORON concentration in coolant:

   Input needed: DF_{Pass} from II.A. and analysis result.

   Analysis (ppb) X DF_{Pass} X DF_{Lab} = Coolant Boron (ppb)

   _____ ppb X _____ X _____ = _____ ppb coolant Boron
   (analysis)

4. Attach any printout to this form.

D. LIQUID Isotopic Analysis

1. Calculate corrected sample volume for MCA analysis entry:

   Input needed: DF_{Pass} from II.A.

   $\frac{\text{Aliquot (ml)}}{DF_{Pass}}$ = Corrected sample vol. for MCA entry

   $\frac{\text{(ml)}}{DF_{Pass}}$ = _____ ml (corrected vol)

2. Attach any printout to this form.

Reviewed By: _____
OSC Coordinator's Assistant

RV PASS SAMPLE ACCOUNTABILITY LOG

Sample Identification	Location (Update after each movement)	Date	Time	Initials

APPENDIX A

REACTOR COOLANT SAMPLING AND ANALYSIS - RB 303' SAMPLE SINK

NOTES

- The following procedure assumes the Reactor Building is accessible, otherwise utilize Appendix B to operate the PASS panel.
- Samples can be obtained from one of three points depending on what systems are in service. All sample points are at the Reactor Building sample sink. Refer to OP 4612 as necessary when sampling the Reactor Cleanup System. The sample points are:

  Reactor Cleanup System

  Reactor Recirc Loop A

  RHR System

CAUTION

A maximum dose rate and dose commitment (review Tables 2 and 3) will be established for this sample prior to it being taken. Dose rates will be monitored during sampling and if it appears the dose commitment will be exceeded, the sampling will be terminated until further evaluation.

A. Sampling of the Reactor Water System (Recirc Loop)

1. Request the OSC to CLOSE/VERIFY CLOSED V10-199A & B. _____

2. Request the OSC to:

   a. OPEN FCV-39 and FCV-40 isolation valves. _____

   b. Notify Chemistry when valves are OPEN. _____

NOTE

Monitor area dose rates with a dose rate meter occasionally during sampling. Be aware of changes due to sampling and valve manipulation.

3. OPERATE RSS-44B and RSS-60 to draw samples from the Reactor Building sample panel per Steps C, D and E below.

_____

B. Sampling of the RHR System (RB 303' Sample Sink)

1. Request the OSC to OPEN V10-198A or B. _____

2. OPERATE RSS-160/161 (common switch at sample panel) and RSS-96 to draw samples from the RHR System per Steps C, D and E below.

_____

WARNING

EXPECT THAT RADIATION LEVELS WILL INCREASE AT THE SAMPLE SINK DURING THE SAMPLE PURGING AND SAMPLING. DO NOT STAY AT THE SAMPLE SINK TO WAIT FOR THE SAMPLE LINES TO PURGE. SEEK A LOW RADIATION AREA IN WHICH TO WAIT.

C. Sample lines must be purged prior to sampling to ensure a representative sample is taken. If the sample lines have not been running, they must be purged for 30 minutes at a rate of about 500 ml/minute prior to obtaining the sample.

_____

D. After the sample line is flushed, if a dissolved oxygen analysis is requested to be run, use a CHEMET or Orbisphere analyzer and run the analysis at the sample panel.

_____

E. As dose rates permit, obtain about a 50 ml sample or less for further analysis in the Chemistry Lab.

_____

F. If RHR or Reactor Cleanup System samples were taken, secure the sample point. If a Reactor Recirc Loop A sample was taken proceed as follows:

1. Request the OSC to CLOSE FCV-39. _____

2. Secure the sample flow path from recirc loop A as follows:

   a. CLOSE RSS-60. _____

   b. CLOSE RSS-44A. _____

3. Re-establish the RWCU influent sample point flow by THROTTLING OPEN RSS-44 as required.

_____

G. Place the sample bottle in a plastic bag on carrier to maintain distance between you and the sample. Proceed promptly to the Chemistry Lab.

_____

H. Once at the Chemistry Lab, place the sample behind a shield, as necessary, to reduce exposure.

_____

I. If a RHR System sample was taken, notify the OSC that sampling is complete and to CLOSE root valve V10-198A(B) which ever was opened in Step B.

_____

J. CLOSE FCV-160, FCV-161 and RSS-96 if opened in Step B.1. _____

K. If a chloride analysis is required, use OP 0634 with a 1 ml sample volume diluted to 30 ml.

_____

L. If a pH analysis is required, insert the probe into the sample bottle while the bottle is still behind the shield and read the pH.

_____

M. If an isotopic analysis is required, perform serial dilutions on 1 ml of the sample until standard counting techniques can be used. Do not exceed 20% dead time.

_____

N. If a boron analysis is required, refer to OP 0630. Use a small sample volume, preferably 1 milliliter with dilutions as needed. Use ICP if available.

_____

O. Report all results to the OSC Coordinator. _____

P. Log all samples on VYOPF 3533.02 for accountability. _____

APPENDIX B

OPERATION OF THE PASS TO SAMPLE REACTOR COOLANT

WARNING

FAILURE TO FOLLOW THESE PROCEDURES VERBATIM COULD RESULT IN DAMAGE TO THE SYSTEM OR PERSONNEL INJURY.

A. If the Gai-Tronics is unavailable, obtain a portable radio from the OSC. _____

B. Obtain the RV Post Accident Sample Kit from the Chemistry Lab. _____

C. Obtain a dose commitment from the OSC Coordinator for this sample prior to the start of sampling. _____

CAUTION

Do not exceed 900 ml of dilution water.

D. Obtain the following from Chemistry supervision:

1. Dilution water volume (Enter here and on VYOPF 3533.01)

   _____ml _____

2. Information as to whether high noble gas activity is present.

   HIGH / LOW (circle one here and on VYOPF 3533.01) _____

3. Request if a gas sample or gas stripping of the liquid sample is required. _____

4. PASS Diluted Liquid Sample volume desired:

   _____ml _____

E. Prerequisites for Sample Panel Set-Up

1. Perform the following:

a. Evacuate and label three off-gas vials, obtain one 2-dram vial, place in lead shield brick.

_____

b. Obtain 2 1½" syringes, 2 rubber septa, tongs, a flashlight, graduated cylinder and other sample containers as needed. (These items can be found in the RV Pass Sample Kit.)

_____

CAUTION

Breaker 11 on AC-DP-5 affects primary containment isolation (PCIV) valves PAS-102/104 (PASS SW-1) and valves PAS-101/103 (PASS SW-2). Failure to maintain positive control of the breaker while primary containment integrity is required by Technical Specifications (plant other than in cold shutdown) could violate LCO 3.7.A.2.

c. Request the OSC to:

1) CLOSE Breaker 11 on AC-DP-5 located in Turbine Building Switchgear Room.

_____

2) POST an Operator at Breaker 11 while the breaker is closed.

_____

3) Notify the OSC that PASS panel operation may affect calibrated jet pump flow indicator FI-2-3-87A/C at CRP 9-4 (jet pumps 1 and 11) from transmitter FT-2-3-63A/C.

_____

d. Notify the OSC when you are ready to leave for sampling.

1) Verify with the OSC that the breaker is closed.

CAUTION

If it appears maximum dose rate or dose commitment will be exceeded, leave high dose rate area and contact OSC Coordinator for further instructions.

2. Argon bottle is >500 psi with tank valve open.

3. Valves PAS-17 and PAS-18 (3-way valves) are positioned with the arrow pointing to the left.

4. CLOSE PAS-27.

WARNING

PAS-112 MUST BE LEFT OPEN EXCEPT WHEN SPECIFIED HEREIN TO PRECLUDE CROSS-CONNECTION OF THE DEMIN WATER SYSTEM WITH THE REACTOR VESSEL.

a. Verify at the panel front, all other valves, with the exception of PAS-32 and PAS-112, are in the CLOSED position.

5. Install new rubber septa on sample valves PAS-39 and PAS-40.

CAUTION

Do not exceed 900 ml of dilution water.

6. Place graduated cylinder under PAS-112 and OPERATE PAS-110 to obtain dilution water.

   a. Fill the dilution water funnel with the recommended volume of demineralized water. _____

F. Sample Panel Operation Instruction

1. Evacuate cylinders B and C and gas septum.

   a. START vacuum pump SW-5. _____

   b. OPEN valves PAS-12, PAS-13, PAS-14 and PAS-15. _____

   c. Run vacuum pump until approximately 0 psia reads on PI-2. _____

   d. CLOSE valve PAS-13. _____

   e. STOP vacuum pump SW-5. _____

   f. Check PI-2 is stable to ensure no leaks. _____

   g. CLOSE PAS-12 and PAS-14.

2. Obtaining a coolant sample in Cylinder A.

NOTES

- Obtain sample from Reactor Vessel by following instructions in Section a. below unless otherwise instructed.
- To obtain sample from HP Heater (training use), go to Section b. below.

a. Reactor Vessel Sampling (From JP-1 unless otherwise directed to sample JP-11)

1) OPEN SW-1 to open PAS-102/104 (inboard sample valves). _____

2) OPEN SW-2 to open PAS-101/103 (outboard sample valves). _____

3) OPEN SW-4 to open PAS-105/106 (purge valves). _____

CAUTION

If there is no pressure indication on PI-1 when sampling, it's possible the line may be plugged. Obtain sample from other reactor sample point and observe pressure indication on PI-1.

4) OPEN valve PAS-2 (for JP-1) or valve PAS-3 (for JP-11) and valves PAS-5, PAS-6 and PAS-8 on panel. _____

CAUTION

Keep pressure high enough to avoid flashing. Monitor area dose rates.

5) THROTTLE valve PAS-7 on panel to initiate flow to approximately 20 gph. Monitor pressure on PI-1 and flow on FI-109-36. Sample lines are now purging.

_____

a) Record FI-109-36 flow:

_____gph _____

CAUTION

Retreat to low dose area during sample purge.

6) Perform the following calculation to determine purge time.

$$\frac{60 \text{ min}}{hr} \times \frac{12 \text{ gallons}}{\text{gal/hr(Flowrate on FI - 109 - 36)}} = \_\_\_\_\_ \text{ (Purge time in minutes)}$$

_____

7) After the line is purged:

a) CLOSE valves PAS-6 and PAS-5 to isolate sample cylinder A.

_____

b) Record sample isolation time.

Time:_____ _____

c) CLOSE SW-2, SW-1 and SW-4.

_____

d) CLOSE valves PAS-2 or PAS-3.

_____

e) CLOSE PAS-8.

_____

8) Fill bath tank with cooling water via bath water funnel (takes approximately 6 liters):

a) Place cylinder under PAS-112 and,

b) OPERATE PAS-110 to obtain demin water.

c) Add ~6 liters of water to the water bath funnel.

_____

9) Proceed to section F.3 ("Gas Strip the Liquid Sample").

b. High Pressure Feedwater Sampling

CAUTION

Sampling of the high pressure feedwater via the pass panel will probably cause solids to make flow indicator FI-109-36 inoperable. Permission of Chemistry supervision is required to proceed with feedwater sampling.

1) OPEN SW-4 (purge valves).

_____

2) OPEN valves PAS-1, PAS-5, PAS-6 and PAS-8.

_____

CAUTION

Keep pressure high to avoid flashing the sample. Monitor area dose rates.

3) THROTTLE valve PAS-7 on panel to initiate flow, monitor pressure on PI-1 and flow on FI-109-36. Sample lines are now purging.

_____

a) Record FI-109-36 flow:

_____gph _____

CAUTION

Retreat to low dose area during purge.

4) Perform the following calculation to determine purge time.

$$\frac{60 \text{ min}}{hr} \times \frac{12 \text{ gallons}}{\text{gal/hr(Flowrate on FI - 109 - 36)}} = \_\_\_\_\_ \text{ (Purge time in minutes)}$$

5) After the line is purged:

a) CLOSE valves PAS-6 and PAS-5 to isolate sample Cylinder A.

b) Record sample isolation time.

Time: _____

c) CLOSE SW-4.

d) CLOSE valves PAS-1 and PAS-8.

6) Fill bath tank with approximately 6 liters of demin cooling water via the bath water funnel:

a) Place graduated cylinder under PAS-112 and,

b) OPERATE PAS-110 to obtain demin water.

c) Add ~6 liters of water to the water bath funnel.

3. Gas Strip the Liquid Sample

NOTE

Gas stripping may be omitted if gas stripping or sampling is not required. If Step 3. is omitted, proceed to Step 4. to fill liquid grab sample assembly.

a. OPEN Valves PAS-10 and PAS-11 and observe pressure change on PI-2.

_____

NOTE

If pressure is >14.7 psi or if a high concentration of noble gases are assumed present, perform Step a.1) to use cylinders B and C; if pressure is <14.7 psi perform Step a.2) to use cylinder B. If cylinders used are a change from initial instructions from supervision, be sure to change VYOPF 3533.01 data to reflect the change.

1) If high concentration of noble gas is assumed present, or if PI-2 shows a positive pressure (>14.7 psi), then:

a) OPEN valve PAS-16.

_____

CAUTION

The following step requires Argon gas to be purged very slowly through the liquid sample.

b) While observing PI-2, operate valve PAS-26 to bring PI-2 to approximately 64 psia.

_____

c) CLOSE PAS-16.

_____

NOTE

This action will ensure good mixing of the internal volumes and will return the system to approximately one atmosphere (14.7 psia).

d) Open PAS-12 to re-expand Cylinder A and B into Cylinder C.

_____

e) If the system is not at 14.7 psia, then OPEN PAS-16.

_____

f) OPERATE PAS-26 and add argon until 14.7 psia is achieved.

_____

g) CLOSE valves PAS-26 and PAS-16 and proceed to Step F.3.a.3) on page 10.

_____

2) If noble gas concentration is not significant or PI-2 remains in vacuum (<14.7 psi), then:

a) OPEN PAS-16.

_____

b) OPERATE PAS-26 to very slowly purge argon gas through the sample and bring PI-2 up to one atmosphere (14.7 psia).

_____

c) CLOSE PAS-16.

_____

3) Perform the following:

a) OPEN valve PAS-14 and PAS-39 and extract 1 ml gas samples with a 1½" syringe at the gas septum.

_____

b) Inject each 1 ml sample into three separate pre-labeled 14 ml vials (e.g., #1, 2, 3) and place vials in shielded container.

_____

4) CLOSE valves PAS-14, PAS-39, PAS-15, PAS-11 and PAS-10.

_____

5) If sample was gas stripped (Step 3.a.1)), CLOSE PAS-12.

_____

6) Return to Chemistry Lab with gas sample or continue with sampling.

_____

7) Enter sample data on VYOPF 3533.02 for accountability of samples.

_____

4. Fill liquid grab sample assembly.

a. OPEN/CHECK OPEN PAS-11, PAS-10 and PAS-15.

_____

b. OPEN PAS-16.

_____

c. OPERATE PAS-26 to achieve 64 psi on pressure gauge PI-2.

_____

d. CLOSE PAS-16.

_____

e. OPEN PAS-21.

_____

f. POSITION PAS-18 with the arrow to the RIGHT.

_____

g. After 30 seconds, POSITION PAS-18 with the arrow to the LEFT.

_____

h. CLOSE PAS-21.

_____

i. OPEN PAS-19 and PAS-16. Note slight pressure drop on PI-2.

_____

j. Allow one minute before proceeding for the grab sample assembly to fill.

_____

k. POSITION PAS-17 and PAS-18 to their mid positions (ARROW DOWN).

_____

l. POSITION the grab sample assembly valves PAS-17 and PAS-18 to the RIGHT.

_____

m. OPEN SW-4 and PAS-8.

_____

n. OPEN PAS-6, PAS-7 and PAS-12 to vent the pressure in Cylinders A, B, and C to the Torus.

_____

o. When the pressure has equalized as indicated on PI-2, CLOSE PAS-6, PAS-7, PAS-8, PAS-10, PAS-11, PAS-12, PAS-16, PAS-19, and PAS-15.

_____

p. CLOSE SW-4.

_____

q. Request the OSC to OPEN Breaker 11.

_____

5. Dilute sample and remove for analysis.

CAUTION

The following drain-down step requires approximately 5 minutes to occur. During this evolution, retreat to a low dose area to reduce exposure.

a. OPEN valves PAS-21 and PAS-24. Allow the dilution water funnel to drain for 1 minute after water is no longer visible in the funnel.

_____

b. CLOSE valve PAS-24.

_____

NOTE

This action will blow argon gas into the line and push all the water into Cylinder D. Read Steps 5.c through 5.f BEFORE PROCEEDING.

c. CRACK OPEN valve PAS-25 approximately 1/4 turn.

_____

d. Allow the argon gas to bubble slowly through Cylinder D for approximately 30 seconds.

e. SLOWLY CLOSE valve PAS-21 and pressurize Cylinder D with argon to approximately 5 psig on PI-3.

AND IMMEDIATELY

f. CLOSE valve PAS-25.

_____

g. OPEN valves PAS-8, PAS-22 and PAS-20.

_____

CAUTION

- **In the following step PAS-23 should be opened only long enough to verify sample flow and ensure that sample is at the sample valves. If the inside edge of tygon tubing is not visible, then it has water in it. Do not allow sample to run out.**
- **This action will allow the diluted sample to flow from Cylinder D through the liquid septum.**
- **Be aware of area dose rate changes.**

h. OPEN valve PAS-23 and observe sample flow at liquid septum/sightglass. Use flashlight if needed.

_____

i. As soon as flow has been observed, CLOSE PAS-23.

_____

j. OPEN valve PAS-21 to release any remaining argon overpressure on PI-3.

_____

CAUTION

When using liquid sample valves, tongs should be used to hold sample container. Monitor dose rates on sample vial during filling.

k. To obtain a sample:

1) OPERATE sample valve PAS-40 to extract a liquid sample with a syringe (<5 ml) or,

2) OPERATE valve PAS-35 for larger volumes.

_____

l. Place appropriate samples in lead shielding and transport to the Chemistry Lab for analysis.

1) Enter sample information on VYOPF 3533.02 to ensure accountability.

_____

APPENDIX C

FLUSHING AND RESTORING THE PASS FOLLOWING USE

NOTE

This Appendix assumes the PASS Panel is configured as-left at the completion of Appendix B.

CAUTION

Breaker 11 on AC-DP-5 affects primary containment isolation (PCIV) valves PAS-102/104 (PASS SW-1) and valves PAS-101/103 (PASS SW-2). Failure to maintain positive control of the breaker while primary containment integrity is required by Technical Specifications (plant other than in cold shutdown) could violate LCO 3.7.A.2.

A. Request the OSC to:

1. CLOSE Breaker 11 on AC-DP-5 located in the Switchgear Room. _____

2. POST an Operator at Breaker 11 while the breaker is energized. _____

B. CLOSE or check closed valves PAS-21, PAS-22, and PAS-35 or PAS-40. _____

C. To repressurize and drain Cylinder D, perform the following:

1. OPEN SW-4. _____

2. OPERATE valve PAS-25 until PI-3 reads approximately 25 psig. _____

3. OPEN valves PAS-23 and PAS-22. _____

4. When flow has ceased through the sightglass, then CLOSE valves PAS-23 and PAS-22. _____

5. Repeat Steps 2 through 4 until no more liquid remains in Cylinder D. _____

D. OPERATE PAS-110 to obtain water from PAS-112.

_____

E. Refill the dilution water funnel with 900 ml of water.

_____

F. OPEN valves PAS-21 and PAS-24.

_____

G. Allow the flush water in the funnel to gravity drain into Cylinder D for 1 minute after it is no longer visible in the funnel.

_____

H. CLOSE valves PAS-24 and PAS-21.

_____

I. CRACK OPEN valve PAS-25 to allow Cylinder D to pressurize to 25 psig on PI-3.

_____

J. CLOSE valve PAS-25.

_____

K. OPEN valve PAS-23 and PAS-22 to allow Cylinder D to drain.

_____

L. CLOSE valves PAS-22 and PAS-23.

_____

M. Repeat Steps I through L as necessary to ensure that no liquid remains in Cylinder D.

_____

N. CYCLE PAS-21 open and closed to bleed off any residual pressure indicated on PI-3.

_____

O. POSITION grab sample valves PAS-17 and PAS-18 so that the arrow points to the LEFT.

_____

CAUTION

Ensure that the inboard sample valve SW-1 remains closed for the following operation (steps P.-R.).

P. OPEN SW-2 and SW-3 (outboard sample and flush valves). _____

Q. CLOSE valves PAS-112 and PAS-20. _____

R. OPEN valves PAS-110, PAS-111, PAS-2 (JP-1) or PAS-3 (JP-11), PAS-5, PAS-6 and THROTTLE PAS-7 while MONITORING FI-109-36 (do not exceed 25 gph). _____

S. After 5 minutes, CLOSE valves PAS-2 or PAS-3 and PAS-111. _____

T. CLOSE SW-3 and SW-2. _____

CAUTION

For steps U. and AA. below, throttle PAS-7 so as not to exceed 25 gph on FI-109-36.

U. CLOSE PAS-7. _____

V. OPEN valves PAS-4, PAS-16 and PAS-19. _____

W. THROTTLE PAS-20 to achieve 15 gph on FI-109-36. _____

X. THROTTLE PAS-7 to achieve 25 gph on FI-109-36. _____

Y. After 1 minute, CLOSE valve PAS-16. _____

Z. FULLY OPEN PAS-20 and THROTTLE PAS-7 as needed to maintain 25 gph on FI-109-36.

AA. After 5 minutes, CLOSE valves PAS-4, PAS-5, PAS-6 and PAS-7.

BB. OPEN PAS-26 to blow water out of the grab sample assembly.

CC. After approximately 30 seconds, CLOSE valves PAS-26, PAS-19, PAS-20 and PAS-8.

DD. CLOSE SW-4.

EE. OPEN valves PAS-11, PAS-12, PAS-13, PAS-14 and PAS-15.

FF. Turn SW-5 ON to start vacuum pump to evacuate Cylinders B and C.

GG. Remove gas septum port, OPEN valve PAS-39 and allow air to enter the evacuated systems for 1 minute as vacuum pump is running.

HH. Turn SW-5 OFF to stop vacuum pump.

II. CLOSE valve PAS-39 and reinstall gas septum cover.

JJ. CLOSE valves PAS-11, PAS-12, PAS-13, PAS-14 and PAS-15.

KK. OPEN valve PAS-27 to allow bath water to gravity drain.

LL. CLOSE PAS-110.

MM. OPEN PAS-112.

NOTE

The Reactor Coolant Sampling Panel is now lined up to repeat sampling procedure as necessary.

WARNING

ENSURE THAT RADIATION LEVELS ALLOW FOR PERSONNEL ACCESS BEHIND THE PASS PANEL AND LIQUID RADIATION LEVELS ALLOW FOR PERFORMING THE NEXT STEP. MONITOR DOSE RATES DURING MOISTURE SEPARATOR DRAINING.

NN. OPEN valve PAS-38 and drain water from the vacuum pump moisture separator into a suitable container. _____

OO. CLOSE PAS-38. _____

PP. Request the OSC to OPEN Breaker 11 on AC-DP-5. _____

QQ. CLOSE argon tank valve. _____

APPENDIX D

PASS SAMPLE ANALYSIS

NOTE

Utilize VYOPF 3533.02 to track samples and any aliquots made for analysis.

CAUTION

Make efficient use of shielding when performing analyses. Be aware of high dose rates.

A. Gas samples

NOTE

Perform hydrogen and oxygen analysis on the gas chromatograph according to DP 2630. Be aware of carrier gas requirements for specific analysis.

1. Adjust vial pressure to zero by injecting approximately 13 ml of the appropriate GC carrier gas into each vial collected. Indicate gas used on vial.

_____

2. Hydrogen and oxygen analyses will be performed as requested by following the gas chromatograph procedure in DP 2630.

_____

   a. Complete VYOPF 3533.01, Section I.B and I.C.

_____

3. Isotopic analysis

   a. Obtain 1 ml of sample from a gas sample vial and inject into an evacuated 14 ml vial.

_____

   b. Analyze gas vial as a general sample using DP 2631 or steps outlined in Section C (High Activity) using sample volume from VYOPF 3533.01, Step I.D. Up to 20% dead time is allowed.

_____

B. Liquid samples

1. Chloride analysis

a. Analyze sample for chloride content per OP 0634.

_____

b. Complete VYOPF 3533.01, Section II.B.

_____

2. Boron analysis

a. Analyze sample for Boron using the Lab ICP using the "50B" method file or by titration per DP 2630.

_____

b. Complete VYOPF 3533.01, Section II.C.

_____

3. Isotopic analysis

a. Using a syringe (shielded if high dose rates exist), obtain 1 ml of sample (more may be used if dose rates allow) and inject into a known geometry container. Fill container with DI water. Record aliquot volume on VYOPF 3533.01, Section II.

_____

b. Analyze liquid sample as a general sample per DP 2631 or steps outlined in Section C to obtain activity in µCi/ml using corrected sample volume from VYOPF 3533.01, Step II.D. Up to 20% dead time is allowed.

_____

c. Complete VYOPF 3533.01, Section II.D.

_____

C. Counting Techniques for Highly Radioactive Samples

NOTE

If sample size or dilutions can be used to permit a sample to be counted by conventional techniques, this should be done. If this is not possible, the following techniques can be used.

1. Use of the MCA at extended distances.

NOTE

If general area dose rate in the Counting Room exceeds 5 mR/hr, the use of the MCA at extended distance with shield top removed is prohibited (LAI-417B).

a. Open the shield top from the 10% germanium detector. _____

b. Using rod and holder, suspend the sample above the detector at a distance that will give a dead time of <20% (must be >1 ft.). _____

c. Measure the distance from the sample to the top of the detector. _____

d. Count the sample using a 2" filter paper geometry efficiency. _____

NOTE

Step e. or f. below may be used to calculate elevated sample activity.

e. Analyze the sample using the MCA selection for "PASS Elevated Samples"

_____

OR

f. Calculate the sample activity as follows:

$\mu Ci/ml = (X)\ (d^2)\ (17)$

_____

NOTE

The below correction factor must be re-evaluated if the detector geometry for the filter paper with a 2" shelf is modified at the time the efficiency calibration (DP 2631) is performed.

where:
X = μCi/ml from isotopic printout
d = distance in ft. measured in B.1.c above
17 = correction factor μCi/ml

_____

Verified by:_____

2. Use of portable instruments.

NOTE

If neither conventional methods or those in Step C.1 can be used, a portable gamma survey meter can be used to determine sample activities.

a. If the MCA is available, it can be used to give a qualitative measure of major isotopes. If it is not available, an assumption must be made based on what is known about the sample at the time.

b. Measure the radiation level of the sample at 1 meter.

_____

c. Calculate the sample activity as follows:

$$\mu Ci/ml = \frac{(R/hr \text{ at } 1 \text{ meter})(10^6)}{(T)\ (V)}$$

_____

Verified by:_____

where:
10^6 = μCi/Ci
V = sample volume (milliliters)
T = R/hr @ 1 meter/Ci

Values for T (R/hr @ 1 meter/Ci)

Time	Degassed Liquid*	Containment Air**
1 hr	0.60	0.41
4 hr	0.43	0.28
8 hr	0.35	0.22
12 hr	0.31	0.18
24 hr	0.26	0.14

* Assumed mix of 0% of core noble gas inventory, 50% of core halogen inventory and 1% of core solids inventory. For convenience, the mix ratio is expressed as 00/50/1 (% NOBLE GAS/% HALOGENS/% SOLIDS)

** Assumed mix of 100/50/1.

TABLE 1

VY - RADIOACTIVITY CONCENTRATION (μCi/g) IN REACTOR COOLANT BASED ON DESIGN BASIS SOURCE TERM (100/50/1)

Nuclide	1 Hour	8 Hours	24 Hours
Kr-85m	6.5E+04	2.2E+04	1.8E+03
Kr-85	2.5E+03	2.5E+03	2.5E+03
Kr-87	8.5E+04	1.9E+03	3.1E-01
Kr-88	1.6E+05	2.9E+04	5.8E+02
Xe-133	5.3E+05	5.3E+05	5.1E+05
Xe-135m	7.5E+04	3.5E+04	6.6E+03
Xe-135	1.9E+05	2.4E+05	1.3E+05
I-131	1.3E+05	1.3E+05	1.2E+05
I-132	1.9E+05	1.8E+05	1.6E+05
I-133	2.7E+05	2.1E+05	1.3E+05
I-134	2.1E+05	1.8E+03	6.9E-03
I-135	2.3E+05	1.1E+05	2.1E+04
Sr-90	1.9E+02	1.9E+02	1.9E+02
Sr-91	3.2E+03	1.9E+03	5.9E+02
Sr-92	2.8E+03	4.7E+02	7.9E+00
Y-91	3.5E+03	3.5E+03	3.5E+03
Y-93	4.0E+03	2.5E+03	8.2E+02
Zr-95	4.6E+03	4.5E+03	4.5E+03
Nb-97	4.5E+03	3.5E+03	1.7E+03
Ru-103	3.9E+03	3.8E+03	3.8E+03
Cs-134	2.6E+02	2.6E+02	2.6E+02
Cs-136	9.3E+01	9.1E+01	8.8E+01
Cs-137	2.6E+02	2.6E+02	2.6E+02
Ba-140	4.7E+03	4.7E+03	4.5E+03
La-140	4.9E+03	4.9E+03	4.8E+03
Ce-141	4.5E+03	4.5E+03	4.4E+03
Ce-143	4.1E+03	3.6E+03	2.6E+03
Eu-156	2.4E+02	2.4E+02	2.3E+02
Np-238	4.1E+02	3.7E+02	3.0E+02
Np-239	5.1E+04	4.7E+04	3.9E+04
TOTAL (above)	2.2E+06	1.6E+06	1.1E+06
TOTAL (including others)	2.4E+06	1.6E+06	1.2E+06

TABLE 1 (Continued)

Assumptions and References:

1. Design Basis Source Term 100% NG, 50% Iodines and 1% Solids.

2. ORIGEN2 Calculation (VY Core Damage Assessment Methodology).

3. NSSS isolated liquid mass = 1.615E+08 g (VY Core Damage Assessment Methodology).

TABLE 2

VY - RADIOACTIVITY CONCENTRATION ($\mu Ci/cm^3$) IN CONTAINMENT ATMOSPHERE AFTER SHUTDOWN BASED ON DESIGN BASIS SOURCE TERM (100/25/0)

Nuclide	1 Hour	8 Hours	24 Hours
Kr-85m	1.6E+03	5.3E+02	4.4E+01
Kr-85	5.9E+01	5.9E+01	5.9E+01
Kr-87	2.0E+03	4.5E+01	7.3E-03
Kr-88	3.8E+03	6.9E+02	1.4E+01
Xe-133	1.3E+04	1.3E+04	1.2E+04
Xe-135m	1.8E+03	8.4E+02	1.6E+02
Xe-135	4.5E+03	5.7E+03	3.2E+03
I-131	1.6E+03	1.5E+03	1.5E+03
I-132	2.3E+03	2.2E+03	1.9E+03
I-133	3.2E+03	2.6E+03	1.5E+03
I-134	2.5E+03	2.2E+01	8.2E-05
I-135	2.7E+03	1.3E+03	2.5E+02
TOTAL (above)	3.9E+04	2.8E+04	2.1E+04

Assumptions and References:

1. ORIGEN2 Calculation (Core Damage Assessment Methodology).
2. Containment Air Volume = 6.742E+09cm^3 (Core Damage Assessment Methodology).
3. Design Basis Source Term: 100% NG and 25% Iodines.

TABLE 3

VY - DOSE RATES (R/hr) AT DIFFERENT SAMPLING STATIONS AT DIFFERENT TIMES AFTER SHUTDOWN[c]

Time (hr)	Post-Accident Sampling Station	Containment Air Sampling Station	Vent Stack Sampling Room
1	4.5E-1[a]	6.0E+0[a]	1.0E+0[b]
3	1.9E-1	2.6E+0	5.1E-1
8	5.4E-02	1.1E+0	2.2E-1
24	6.8E-03	4.7E-1	5.8E-02
72	4.1E-03	3.1E-1	1.8E-02

NOTES:

[a] Per Calculation VYC-70.

[b] Per Calculation VYC-83, Vent Stack Only.

[c] Dose Rates at other decay times are based on Table 11 of EDS Nuclear, Report No. 02-0180-1126, December 29, 1979.

TABLE 4

VY - REACTOR COOLANT AND CONTAINMENT AIR SAMPLES
DOSE RATES (R/hr) AT DIFFERENT TIMES AFTER SHUTDOWN[a]

Time (hr)	$1cm^3$ Undiluted Degassed Reactor Coolant	$1cm^3$ Dissolved Gas From 1cm Pressurized Reactor Coolant	$1cm^3$ Undiluted Containment Air Sample
1	2.0E+0[b]	8.9E-1[b]	1.6E-02[b]
3	1.2E+0	3.9E-1	7.0E-03
8	6.4E-1	1.6E-1	2.9E-03
24	3.2E-1	6.9E-02	1.3E-03
72	1.5E-1	4.6E-02	8.3E-04

NOTES:

[a] All dose rates are calculated at 1m away from the source. Dose rates at other decay times are based on Table 11 of EDS Nuclear, Report No. 02-0180-1026, December 29, 1979.

[b] Per VYC-70, no shielding, no dilution.