10 CFR 50, Appendix E

Progress Energy

Serial: RNP-RA/03-0030

MAR 04 2003

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

TRANSMITTAL OF EMERGENCY PROCEDURE REVISIONS

Ladies and Gentlemen:

In accordance with 10 CFR 50.4(b)(5) and Appendix E to 10 CFR 50, Progress Energy Carolinas, Inc. (also known as Carolina Power and Light Company), is transmitting revisions to H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Emergency Implementing Procedures. The procedure revisions and effective dates are listed in the attachment to this letter.

A description of the procedure changes are provided on the "Summary of Changes" page for the emergency procedures. Please replace the superseded procedures with the enclosed revisions.

If you have any questions concerning this matter, please contact me.

Sincerely,

C. T. Baucom
Supervisor – Licensing/Regulatory Programs

CAC/cac

Attachment

Enclosures

c: L. A. Reyes, NRC, Region II (2 copies)
NRC Resident Inspector, HBRSEP
C. Patel, NRC, NRR (w/o Attachment and Enclosures)

A045

Progress Energy Carolinas, Inc
3581 West Entrance Road
Hartsville, SC 29550

Procedure Revisions and Effective Dates

Procedure	Revision No.	Effective Date
EPOSC-01, "Operational Support Center Leader"	9	02/24/2003
EPOSC-03, "Environmental and Radiation Control Team"	7	02/24/2003
EPPRO-05, "Scenario Development and Drill Control Guidelines"	2	02/18/2003
EPRAD-03, "Dose Projections"	13	02/04/2003

Progress Energy

R
Reference
Use

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 2

PART 5

EPOSC-01

OPERATIONAL SUPPORT CENTER LEADER

REVISION 9

SUMMARY OF CHANGES

STEP	REASON FOR REVISION
Cover Page	Cover Page revised to reflect Progress Energy Logo per AP-007 format.
Entire Procedure	Revised page numbering sequence to comply with AP-007 format
Attachment 8.1.5.6	Deleted Attachment 8.1.5.6, OSC Leader Administrative Assistant Checklist. Information moved to Attachment 8.1.5.7, OSC Positions Checklists
Attachment 8.1.5.7	Deleted Attachment 8.1.5.7, Storekeeper Checklist. Information moved to Attachment 8.1.5.7, OSC Positions Checklists Revised procedure to incorporate E&C and RC Lead positions (AR #61746) Revised procedure to reflect positions listed on the tag board (AR 60016)
Attachment 8.1.5.8	Renumbered and renamed Attachment 8.1.5.8, OSC Tag Board/Position Checklist to Attachment 8.1.5.7, OSC Positions Checklists
Attachment 8.1.5.9 (old)	Renumbered attachment number for OSC Personnel Roster to Attachment 8.1.5.6 throughout the procedure.

TABLE OF CONTENTS

OSC LEADER QUICK START GUIDE

NOTE: Blanks are provided for place keeping √'s only, logs are the official record. This is a summary level guide and does not replace the procedure steps.

1. If Dialogic was used for callout, upon arrival at the Facility, notify Dialogic at X 1777. _____
2. Announce your presence and position in the Operational Support Center (OSC). _____
3. Establish communications with the Control Room and/or TSC. _____
4. Set up the OSC per Attachment 8.1.5.1, OSC Activation/Layout. _____
5. Initiate accountability. _____
6. Ensure that the Security Watchperson maintains access control. _____
7. Ensure that the facility is being monitored for habitability. _____
8. Instruct personnel to obtain their equipment and prepare for missions. _____
9. Synchronize clocks with ERFIS/EDS. _____
10. Conduct initial status briefing. _____
11. Participate in interfacility briefings with the EOF/TSC as time permits. _____
12. Notify the Site Emergency Coordinator (SEC) of readiness to activate the OSC. _____
13. Refer to procedure steps. _____

8.1 OPERATIONS SUPPORT CENTER LEADER

8.1.1 PURPOSE

1. The purpose of this procedure is to describe the duties and responsibilities of the Operational Support Center (OSC) Leader. Attachments to this procedure describe the organization, activation, and operation of the OSC.

8.1.2 RESPONSIBILITIES

NOTE: In order to augment the staff of the Control Room as soon as practical, activation of the OSC is permitted with partial staffing.

1. The OSC Leader is responsible to the Emergency Repair Director (ERD) when the Technical Support Center (TSC) is activated. The OSC Leader is responsible to the Control Room Site Emergency Coordinator (SEC) prior to the activation of the TSC. General responsibilities include:

   a. Activation of the OSC is required at Alert or higher emergency classification or at a lower level if directed by the SEC.

   b. Coordinating the activities of the OSC and supporting its assigned personnel.

8.1.3 INSTRUCTIONS

NOTE: Initial actions of this procedure can be implemented by the Damage Control Team Leader (DCTL) in the absence of the OSC Team Leader.

1. The OSC staff will be called out if required at an Alert or higher emergency classification.

   a. Activation at a lower level may be directed by the SEC.

8.1.3 (Continued)

2. Upon reporting to the OSC, the OSC Leader shall:

   a. Establish communications with the Control Room or the Emergency Repair Director (ERD) if the TSC is activated, giving the status of OSC augmentation.

      – Use the OSC Tag Board for tracking.

      – Request plant status and any repair missions underway or needed.

   b. Announce his name and position title.

   c. He shall then order all non-emergency response personnel be moved from the main working areas of the OSC.

      – See Attachment 8.1.5.1, OSC Activation/Layout, to ensure that only emergency response personnel are located in the main OSC working areas.

      – This practice may be modified for drill purposes.

   d. Ensure accountability initiated, call Emergency Security Team Leader (ESTL) when complete.

      – Assign the Security Watchperson to establish OSC access control.

      – See Attachment 8.1.5.1, OSC Activation/Layout, for location of the OSC access control desk.

      – The Security Watchperson will maintain Attachment 8.1.5.2, OSC Personnel Log. A radiological control point may be set up at this location if the OSC leader deems it appropriate.

      – Supplies and equipment (including a phone) for this purpose are located in the OSC Command Center desk and file drawers.

8.1.3.2 (Continued)

NOTE: The Tag Board describes the recommended OSC staff. Other personnel may be assigned to the facility as needed. Not all personnel assigned to the OSC are required to have a tag. If the emergency can be handled with less than the recommended staff, the OSC can be activated.

e. Use the Tag Board located at the OSC entrance and Attachment 8.1.5.6, OSC Personnel Roster, to ensure that the OSC organization is properly staffed.

   - Attachment 8.1.5.3, OSC Organization, describes the normal staffing.

f. Place all phones, radios, and status boards according to Attachment 8.1.5.1, OSC Activation/Layout.

   - Communication lines should be checked with the TSC and the Control Room.

   - Communications information is contained in EPNOT-00, Notification and Emergency Communicators, and the ERO Phone Book.

g. Determine the need for additional equipment, supplies, and manpower.

   - Requests should be made through the ERD to the ALM.

h. Upon reaching an adequate staffing level, the OSC Leader (or in his absence, the DCTL) shall declare the facility activated.

   - This must be done by an announcement in the facility and by a call to the ERD.

   - A final personnel accountability check will be made and the ESTL shall be informed of the result.

8.1.3.2 (Continued)

i. Obtain an initial briefing on plant status and emergency operations from the Control Room or ERD, if the TSC has been activated.

– Conduct a detailed briefing for all OSC personnel.

3. The OSC Leader will control, direct, and support assigned personnel as follows:

a. Upon notification of a mission from the ERD, ensure that the personnel and resources necessary for the mission are available.

– Whenever it is determined that an OSC mission is not practical or feasible during the course of a declared emergency, advise the ERD for appropriate action.

b. Ensure that briefings are conducted for E&RC activities dispatched from the OSC per EPOSC-03, Attachment 8.3.5.2, E&RC Activities Briefing Sheet. (AR #47564, AR #43529)

– If a medical emergency exists, verbal authorization may be given for team dispatch as long as the information is documented in the OSC Team Leader log.

c. Conduct frequent status update briefings with OSC staff personnel.

d. Keep the ERD informed of the status of missions/teams.

e. The OSC Leader shall direct the E&RC personnel to establish and monitor habitability in the OSC.

8.1.3.3 (Continued)

f. Consult the Site Industrial Safety Representative and/or Chemistry personnel to assist with determining the appropriate protective actions in the event of a chemical/toxic hazard.

- If deemed necessary, take steps to secure ventilation. (AR #28241)

g. Ensure the following positions are functioning as follows:

- The OSC Leader Administrative Assistant will perform duties specified in Attachment 8.1.5.7, OSC Positions Checklists.

- The OSC Storekeeper will perform duties to ensure that OSC personnel have access to tools and spare parts according to Attachment 8.1.5.7, OSC Positions Checklists.

- The Facility Administrative Assistant will perform miscellaneous administrative duties as directed by the OSC Leader per Attachment 8.1.5.7, OSC Positions Checklists.

- The Security Watchperson will assist with OSC accountability, perform duties to ensure that OSC personnel have appropriate access to plant areas, and maintain access control for the facility per Attachment 8.1.5.7, OSC Positions Checklists.

- DCTL operations shall be conducted according to EPOSC-02, Damage Control Team Leader.

- If available, an E&RC Supervisor will direct the Plant Monitoring Teams, Personnel Protection Teams, and Decontamination Teams, and Chemistry Teams in accordance with EPOSC-03, Environmental & Radiation Control Team. The E&RC Supervisor may interface directly with the Radiological Control Director in the TSC for communication of E&RC data.

8.1.3.3.g (Continued)

- If an E&RC Supervisor is not available in the E&RC Technician staff, the OSC Leader shall direct Plant Monitoring, Personnel Protection, Decontamination, and Chemistry Teams in accordance with EPOSC-03, Environmental & Radiation Control Team. A "lead" may be assigned from the available E&RC Technician staff for this function.

4. IF adverse environmental conditions dictate, move the OSC in accordance with Attachment 8.1.5.5, Backup OSC Setup.

   a. Consider evacuation if the actual or anticipated total accumulated dose exceeds 1000 mR.

   b. The decision to evacuate the OSC will be done in conjunction with the ERD and the Radiological Control Director (RCD) in the TSC or the SEC.

      - The SEC will approve relocation of the OSC.

5. Ensure proper use of communications equipment. Identify yourself by name and the position you hold at the beginning of each transmission.

6. Upon instructions from the ERD or SEC, the OSC Leader shall deactivate the facility by appropriately notifying all OSC personnel and assuring that all equipment and supplies are returned to the appropriate storage location. Review OSC Leader Log for completeness and accuracy.

8.1.4 RECORDS

N/A

8.1.5 ATTACHMENTS

8.1.5.1 OSC Activation/Layout

8.1.5.2 OSC Personnel Log

8.1.5.3 OSC Organization

8.1.5.4 OSC Leader Checklist

8.1.5.5 Backup OSC Setup

8.1.5.6 OSC Personnel Roster

8.1.5.7 OSC Positions Checklists

8.1.5.8 Operations Support Center (OSC) Four Day Work Schedule

OSC ACTIVATION/LAYOUT

Upon reaching requirement for OSC activation, the following should be performed:

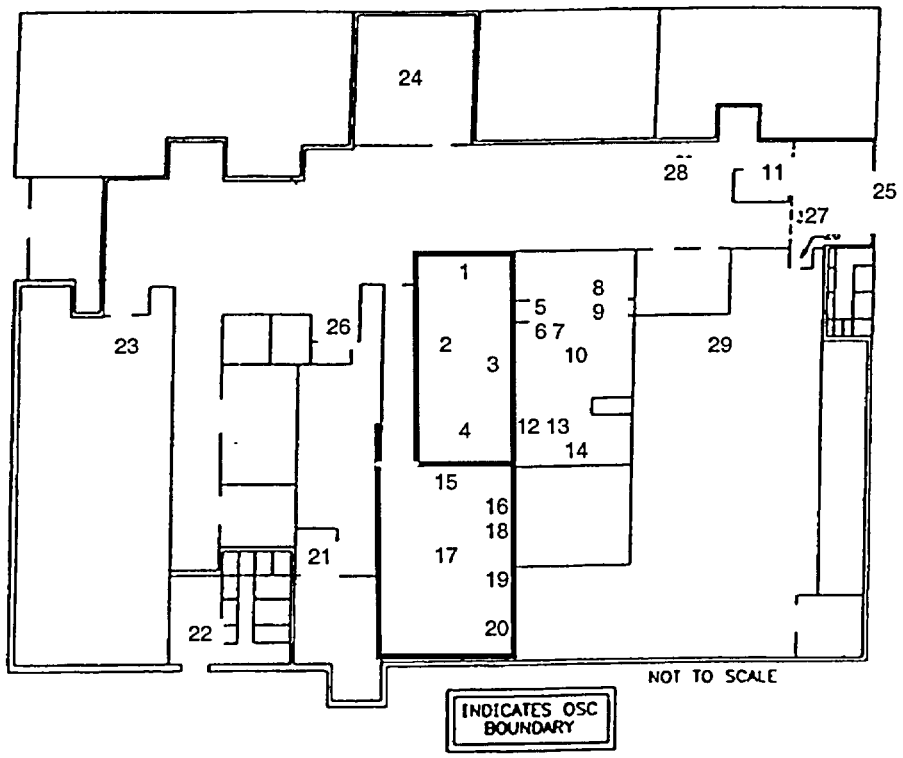
- Set up equipment per Attachment 8.1.5.1, OSC Activation/Layout, Page 2 of 2:
  - OSC Tag Board
  - OSC Status Board
  - Plant Diagram Chart
  - Rearrange tables in Maintenance conference room and break room for OSC use.
  - Table for Access Control
  - Telephones (plug into appropriately marked jack for that OSC position).
  - Fax Machine (to be moved from Maintenance first floor library).
  - Emergency Status and OSC Habitability signs
  - Office supplies and Materials for all positions
- Establish access control as follows:
  - Place No Exit/Entry signs/barriers at boundary doors and access (doors may be Locked to Prevent entry).
  - Turn elevator key to stop position with elevator on first floor and door open.
  - All OSC personnel sign in on Attachment 8.1.5.2, OSC Personnel Log.
  - Have all non-emergency response personnel leave OSC.
  - All personnel entering or exiting sign in on Attachment 8.1.5.2, OSC Personnel Log, (include destination in space provided when exiting).
  - Do not permit non-emergency response personnel entry into the OSC unless authorized by OSC Leader.

Telephones and supplies are located in the OSC Command Center desk drawers and file cabinet. Setup equipment is also stored in the breakroom closet near vending machines. H.P. Equipment is in H.P. cabinets located in break room as well as in closet next to first floor restrooms.

The OSC Leader will ensure setup. All OSC personnel should be responsible to set up of their own assigned areas with the assistance of other responding OSC personnel.

OSC ACTIVATION/LAYOUT

O&M BUILDING 1st FLOOR SUGGESTED LAYOUT FOR OSC



1. OSC Leader (5034)
2. OSC Leader Admin Asst (5026)
3. E&RC Team Leader (5027)
4. OSC Status Board
5. Damage Control Team Leader (5015)
6. Mechanical Supervisor (5018)
7. I&C/Electrical Supervisor (5019)
8. RC Coordinator (5020) *
9. ALARA (5023) *
10 Briefing/DeBriefing Area
11. Security Watchperson
12. Mechanical Planner (5013)
13. I&C Electrical Planner (5013)
14. Plant Diagram Board
15. HP Emergency Kit Lockers
16 Fax Machine
17. RC Table
18 Chemistry/E&C Coordinator Area (5033)
19. RWP Area
20. Dosimetry Area
21. OSC Equipment Storage
22. Access to 2nd Floor via Stairwell (South Door)
23. Storekeeper Area
24. DCT Staging/Waiting Area
25 OSC Entrance/Exit
26. HP Storage
27. Barrier for Access to 2nd floor during Drill/Exercise
28 OSC Tag Board
29. I&C Electrical Staging/Waiting Area

* 8 & 9 may be same person.

ATTACHMENT 8.1.5.2
Page 1 of 1
OSC PERSONNEL LOG

SHEET # _____ Date _____

#	NAME (Please Print)	OSC POSITION	TIME		* LOG OUT DESTINATION
			IN	OUT	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
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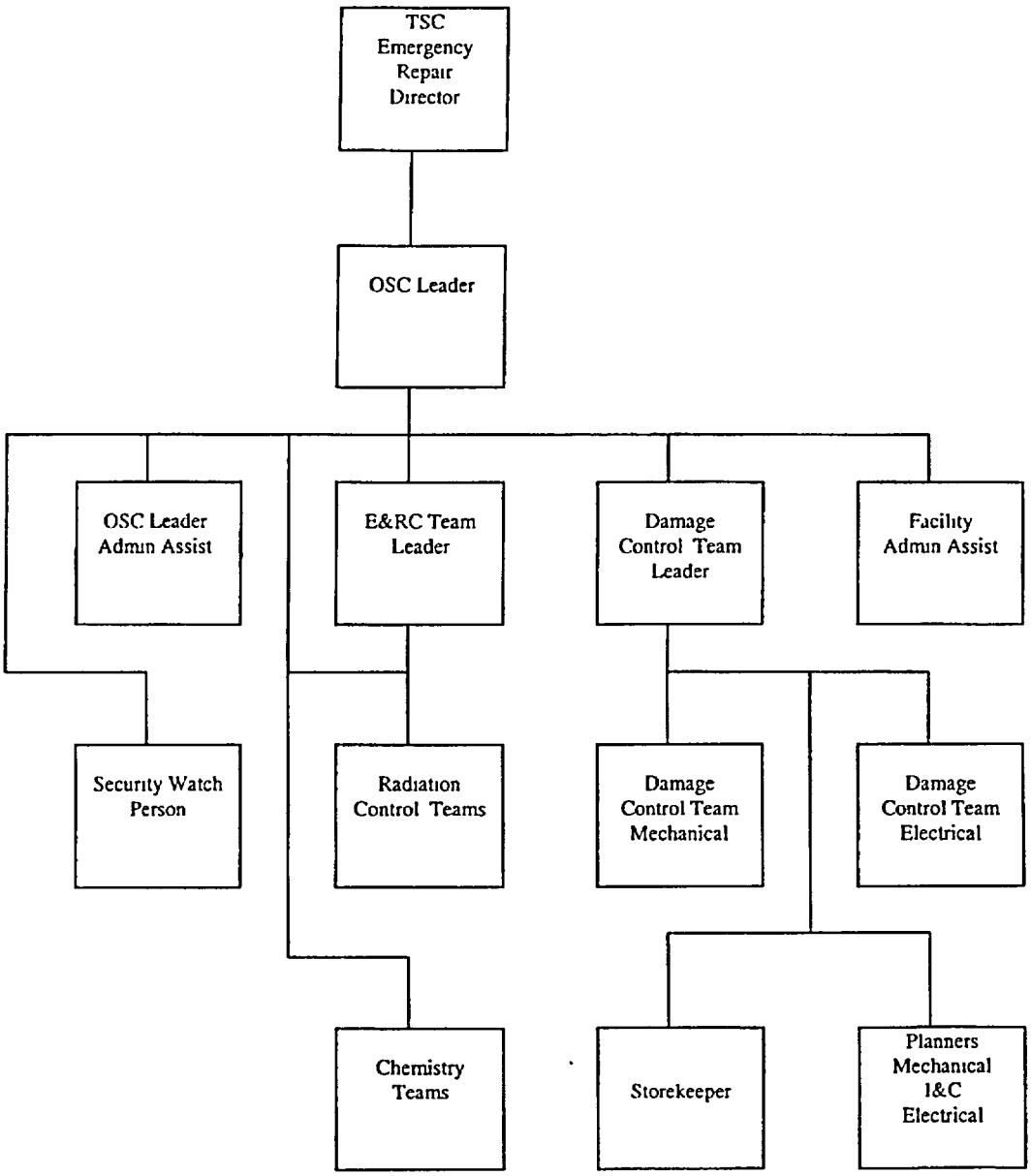
26					

OSC ORGANIZATION



OSC LEADER CHECKLIST

ACTIVATION

- Upon your arrival, announce your presence in the OSC and establish communications with the Control Room, or the ERD if the TSC has been activated giving status of augmentation and requesting missions information.
- The OSC Leader or in his absence, the Damage Control Leader shall declare the facility activated upon reaching an adequate staffing level.
- Order the immediate removal of all non-response personnel from the OSC main working areas.
- Set up the OSC similar to Attachment 8.1.5.1, OSC Activation/Layout Diagram. The OSC boundaries may be modified to better facilitate OSC operations at the discretion of the OSC Leader.
- Set up telephones (phones are located in the OSC Command Center file drawers), placing them according to the marked numbers on the OSC Layout Diagram (phone jacks on walls are also marked).
- Ensure accountability is initiated, call Security Team Leader when complete.
- Ensure that the Security Watchperson maintains access control and the Personnel Log.
- Ensure that the facility is adequately staffed for the emergency at hand, (refer to the Tag Board).
- Ensure that the facility is being monitored for radiological habitability.
- Make requests for additional personnel and equipment as the situation dictates.
- Obtain initial plant status briefing from Control Room and TSC personnel and conduct briefing for OSC personnel. (Emergency Facility Telephone Numbers can be found in the ERO Phone Book).
- Instruct personnel to obtain their equipment and to prepare for missions (have some Maintenance personnel get into anti-Cs).
- Synchronize clocks to ERFIS/EDS.
- Declare the OSC activated. Announce activation and time activated using the OSC public address system. Report the same to the Emergency Repair Director or SEC.

OSC LEADER CHECKLIST

OPERATIONS

- Support overall emergency response efforts
- Ensure the OSC Leader Log, Tag and OSC Status Board are being maintained.
- Ensure Damage Control Teams are preparing for missions.
- Conduct frequent briefings of OSC personnel
- Participate in inter-facility briefings with the EOF/TSC as time permits.

  General Briefings:

  - Emergency condition/action level.
  - Plant status.
  - Wind direction and radiation level
  - Team Specific Briefings/Debriefing will be given by the Team Leaders and Supervisors.

EVACUATION

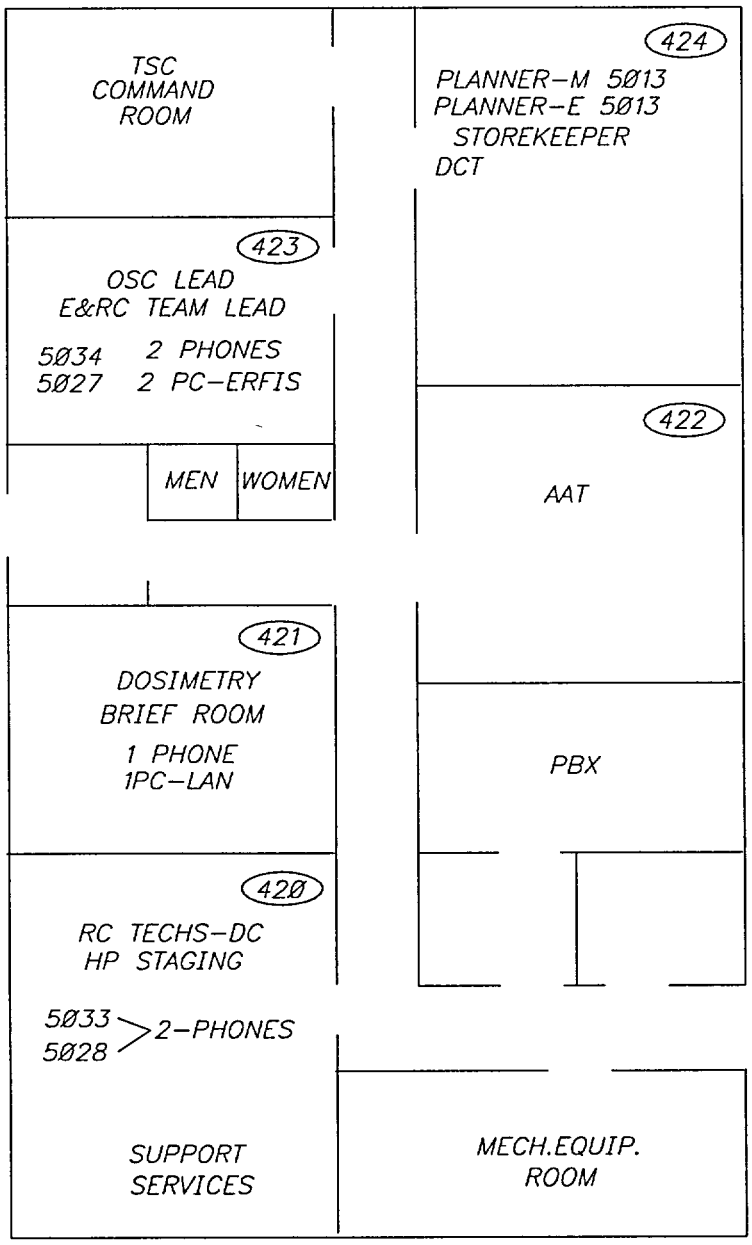
- Should it become necessary, evacuate the facility according to Attachment 8.1.5.5, Backup OSC Setup.

DEACTIVATION

- Review OSC Log for completeness and accuracy.
- Ensure all logs and Attachments are given to the Emergency Preparedness Staff.
- Ensure proper decontamination is performed if required.
- Ensure all assigned personnel return and inventory their equipment.
- Ensure all lockers for equipment and supplies are locked or sealed.
- Leave the area in a clean condition.
- Notify OSC personnel that the OSC has been deactivated. This notification should be communicated to individuals in the field.
- Give a final deactivation status report to the ERD or the SEC.

ATTACHMENT 8.1.5.5
Page 1 of 2
BACKUP OSC SETUP

The backup OSC is located in Building 410 (Training). Should adverse environmental conditions dictate, the OSC Leader, in concurrence with the ERD and the RCD, is responsible for making the decision to evacuate the primary OSC. The attached diagram provides the recommended layout for the Backup OSC.



BACKUP OSC SETUP

Room 424 Planners (Electrical and Mechanical); Damage Control Teams; Storekeeper

Room 423 OSC Leader; E&RC Team Lead; OSC Admin Assistant; Facility Admin Assistant

Room 421 Dosimetry/RWPs; Mission Briefing Room

Room 420 E&RC Staging Area (RC/E&C Techs)

The following equipment should be moved from the primary OSC to the Backup OSC:

- OSC Personnel Log
- Any Manual Logs Generated
- Radiation Work Permits
- Radios (Maintenance and E&RC)
- Survey Instruments and supplies
- Other equipment as deemed necessary for continued operation

ATTACHMENT 8.1.5.6
Page 1 of 1

OSC PERSONNEL ROSTER

NOTE: The positions listed below are recommended for activation purposes, however, partial activation should be considered in order to assist the Control Room as soon as practical.

	NAME (PLEASE PRINT) / TIME
_____ OSC LEADER	_____ / _____
_____ E&C TECHNICIAN #1 (on-shift)	_____ / _____
_____ E&C TECHNICIAN #2 (B1-75)	_____ / _____
_____ E&C TECHNICIAN #3	_____ / _____
_____ E&C TECHNICIAN #4	_____ / _____
_____ RC TECHNICIAN (on-shift)	_____ / _____
_____ RC TECHNICIAN #1 (B1-45)	_____ / _____
_____ RC TECHNICIAN #2 (B1-45)	_____ / _____
_____ RC TECHNICIAN #3 (B1-45)	_____ / _____
_____ RC TECHNICIAN #4 (B1-45)	_____ / _____
_____ RC TECHNICIAN #5 (B1-75)	_____ / _____
_____ RC TECHNICIAN #6 (B1-75)	_____ / _____
_____ RC TECHNICIAN #7 (B1-75)	_____ / _____
_____ RC TECHNICIAN #8 (B1-75)	_____ / _____
_____ DAMAGE CONTROL LEADER	_____ / _____
_____ MECHANIC #1 (on-shift)	_____ / _____
_____ MECHANIC #2 (B1-75)	_____ / _____
_____ MECHANIC #3 (B1-75)	_____ / _____
_____ MECHANIC #4	_____ / _____
_____ ELEC./I&C TECH #1 (on-shift)	_____ / _____
_____ ELEC./I&C TECH #2 (on-shift)	_____ / _____
_____ ELEC./I&C TECH #3 (B1-45)	_____ / _____
_____ ELEC./I&C TECH #4 (B1-75)	_____ / _____
_____ OSC STOREKEEPER	_____ / _____

****

OSC POSITIONS LISTED BELOW ARE NOT REQUIRED FOR INITIAL OSC ACTIVATION.

****

_____ RC COORDINATOR	_____ / _____
_____ E&C COORDINATOR	_____ / _____
_____ MECHANICAL PLANNER	_____ / _____
_____ ELEC./I&C PLANNER	_____ / _____
_____ OSC LEADER ADMIN ASSISTANT	_____ / _____
_____ FACILITY ADMIN ASSISTANT	_____ / _____

ATTACHMENT 8.1.5.7
Page 1 of 3
OSC POSITIONS CHECKLISTS

The checklists listed below represent the functional responsibilities for the ERO members of OSC staff.

OSC LEADER

Report to ERD

- declare presence
- evacuate non-responders
- call Security
- access control
- staff completely
- brief on status
- ensure OSC setup
- declare operations
- report attendance
- support TSC operations
- ensure OSC deactivation
- oversight and support of Damage Control teams

SECURITY WATCHPERSON

Report to OSC Leader

- setup Security desk
- report readiness
- contact OSC Leader on special access
- assist in accountability
- setup access desk
- set up personnel log
- ensure tag board is being used
- ensure all other entry points are blocked
- maintain access control to OSC
- assist in OSC deactivation

OSC LEADER ADMINISTRATIVE ASSISTANT

Report to OSC Leader

- obtain log forms
- assist in OSC setup
- report readiness
- assist OSC Leader
- log all major OSC activities/communications
- maintain OSC Status Board
- assist in OSC deactivation

FACILITY ADMINISTRATIVE ASSISTANT

Report to OSC Leader

- assist in facility activation
- perform miscellaneous administrative duties
- assist with facility deactivation as requested
- assist in preparation of shift relief/turnover schedule

DCT LEADER

Report to OSC Leader

- assist in OSC setup
- assemble team members
- equip Teams
- check team equipment
- take attendance
- report readiness
- perform Damage Control missions as requested by the OSC Leader
- give Damage Control Team briefings/debriefings
- assist in OSC deactivation

E&RC LEAD

Report to OSC Leader

- assist in OSC setup.
- obtain/check equipment.
- report readiness.
- provide Radiological direction to Damage Control Teams.
- interface with the RC/E&C Coordinators.
- assist in Damage Control Team briefings/debriefings
- assist in OSC deactivation

OSC POSITIONS CHECKLISTS

The checklists listed below represent the functional responsibilities for the ERO members of OSC staff.

MAINT. PLANNER MECHANICAL

Report to DCTL

-assist in OSC setup

- prepare work instructions for damage control appropriate to the situation and time available (mechanical emphasis)
- assist in OSC deactivation

MAINT. PLANNER ELECTRICAL

Report to DCTL

-assist in OSC setup

- prepare work instructions for damage control appropriate to the situation and time available (electrical/I&C emphasis)
- assist in OSC deactivation

STOREKEEPER

Report to Damage Control Team Leader

- assist in OSC setup
- open tool areas
- prepare to issue tools
- report readiness
- issue tool/equipment to personnel as needed
- assist OSC Leader
- assist in OSC deactivation

MAINT. SUPERVISOR MECHANICAL

Report to DCTL

- assist in OSC setup.
- assemble team members.
- equip. Teams.
- check team equip.
- report readiness.
- perform Damage Control - Maint./Ops as required by the DCT Leader.
- give Damage Control Team briefings/debriefings.
- assist in OSC deactivation

MAINT. SUPERVISOR I&C ELECTRICAL

Report to DCTL

-- assist in OSC setup.
- assemble team members.
- equip. Teams.
- check team equip.
- report readiness.
- perform Damage Control - Maint./Ops as required by the DCT Leader.
- give Damage Control Team briefings/debriefings.
- assist in OSC deactivation

DAMAGE CONTROL TEAM - MECHANICAL

Report to Maint. Mech. Supervisor

- assist in OSC setup.
- assemble equipment.
- check equipment.
- report readiness.
- perform damage control activities as directed by the DCT Leader
- assist in OSC deactivation

DAMAGE CONTROL TEAM - ELECTRICAL

Report to Maint. Supervisor - I&C/Elect.

- assist in OSC setup.
- assemble equipment.
- check equipment.
- report readiness.
- perform damage control activities as directed by the DCT Leader.
- assist in OSC deactivation

OSC POSITIONS CHECKLISTS

The checklists listed below represent the functional responsibilities for the ERO members of OSC staff.

RC COORDINATOR

Report to OSC Leader

- assist in OSC setup.
- Coordinate and support the work of team members of the Radiation Control Teams.
- obtain equipment.
- check equipment
- perform ALARA and team dispatch briefings.
- report readiness
- assist in OSC deactivation

E&C COORDINATOR

Report to OSC Leader

- assist in OSC setup.
- Coordinate and support the work of team members of the Chemistry Teams.
- obtain equipment.
- check equipment.
- report readiness.
- assist in OSC deactivation

RC TECH - DAMAGE CONTROL

Report to E&RC Lead/ RC Coordinator

- assist in OSC setup
- obtain equipment.
- check equipment.
- report readiness.
- perform HP work as directed by the E&RC Lead/RC Coordinator.
- assist in OSC deactivation.

RC TECH – FACILITIES

Report to E&RC Lead/ RC Coordinator

- assist in OSC setup
- obtain equipment.
- check equipment.
- report readiness.
- perform HP work as directed by the E&RC Lead/RC Coordinator.
- assist in OSC deactivation

CHEMISTRY TECH

Report to E&RC Lead/ E&C Coordinator

- assist in OSC setup.
- check equipment.
- report readiness.
- perform duties as directed by the E&C/RC Coordinator.
- assist in OSC deactivation.

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
OSC Leader			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Leader			Name	Name	Name	Name
	1					
	2					
	3					
E&RC Team Leader			Name	Name	Name	Name
	1					
	2					
	3					
RC Coordinator			Name	Name	Name	Name
	1					
	2					
	3					
E&C Coordinator			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Radiation Control Technician Damage Control			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Damage Control			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Damage Control			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Damage Control			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Facilities			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Facilities			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Chemistry Technician			Name	Name	Name	Name
	1					
	2					
	3					
Chemistry Technician			Name	Name	Name	Name
	1					
	2					
	3					
Chemistry Technician			Name	Name	Name	Name
	1					
	2					
	3					
Chemistry Technician			Name	Name	Name	Name
	1					
	2					
	3					
Maintenance Planner Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Maintenance Planner Electrical			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Radiation Control Technician Facilities			Name	Name	Name	Name
	1					
	2					
	3					
Radiation Control Technician Facilities			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Mechanical			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Damage Control Team Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Electrical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Electrical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Electrical			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Damage Control Team Electrical			Name	Name	Name	Name
	1					
	2					
	3					
Damage Control Team Electrical			Name	Name	Name	Name
	1					
	2					
	3					
Maintenance Supervisor Mechanical			Name	Name	Name	Name
	1					
	2					
	3					
Maintenance Supervisor I&C/Electrical			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
OSC Administrative Assistant			Name	Name	Name	Name
	1					
	2					
	3					
Facility Administrative Assistant			Name	Name	Name	Name
	1					
	2					
	3					
Storekeeper			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

OPERATIONS SUPPORT CENTER (OSC) FOUR DAY WORK SCHEDULE

Position	Shift	Time*	Date / /	Date / /	Date / /	Date / /
Others:			Name	Name	Name	Name
	1					
	2					
	3					
			Name	Name	Name	Name
	1					
	2					
	3					
			Name	Name	Name	Name
	1					
	2					
	3					
			Name	Name	Name	Name
	1					
	2					
	3					

* Shift times may vary - i.e., (2) 12-hour shifts, (3) 8-hour shifts
If (2) 12-hour shifts - use shift 1-shift 2 boxes
If (3) 8-hour shifts - use shift 1-shift 2 and shift 3 boxes

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PLANT OPERATING MANUAL

VOLUME 2

PART 5

EPOSC-03

ENVIRONMENTAL AND RADIATION CONTROL TEAM

REVISION 7

SUMMARY OF CHANGES

SECTION/STEP	REVISION
Cover Page	Revised cover page to reflect Progress Energy logo.
Step 8.3.2.2	Added E&RC Team Leader position and responsibilities to procedure.
Step 8.3.2.3 and Step 8.3.2.4	Added responsibilities for the RC Coordinator position. (AR #61746)
Step 8.3.2.5	Added responsibilities for the E&C Coordinator position. (AR #61746)
Step 8.3.3.9	Revised step to provide additional guidance for updating teams in the field.
Entire Procedure	Revised page numbering to reflect AP-007 format.

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ENVIRONMENTAL AND RADIATION CONTROL TEAM QUICK START GUIDE

NOTE: Blanks are provided for place keeping √'s only, logs are the official record. This is a summary level guide and does not replace the procedure steps.

1. If Dialogic was used for callout, upon arrival at the Facility, notify Dialogic at X 1777. _____

2. Upon arrival at the Operational Support Center (OSC) establish communications with the Radiation Control Director (RCD) in the Technical Support Center (TSC). _____

3. Prepare the E&RC work area in the OSC. _____

4. Assure that adequate E&RC staffing is available. _____

5. Monitor OSC habitability. _____

6. Report the E&RC Personnel readiness to the OSC Leader. _____

7. Obtain respirator qualification printout for use during respirator issue. _____

8. If necessary, refer to Attachment 8.3.5.1, E&RC Team Activity Priorities. _____

9. Refer to procedure. _____

8.3 ENVIRONMENTAL AND RADIATION CONTROL TEAM

8.3.1 PURPOSE

1. The purpose of this procedure is to provide the guidelines to be used by the OSC Leader or, if available, an E&RC Supervisor from the E&RC staff in the OSC.

8.3.2 RESPONSIBILITIES

1. The E&RC Team is responsible to the OSC Leader for general Radiation Control, Plant Monitoring, ALARA, Personnel Protection and Mission Support.

2. The E&RC Team Leader (E&RC Supervisor or assigned lead technician) or the OSC Leader is responsible for designating personnel from the E&RC staff to fill the RC Coordinator and E&C Coordinator positions.

3. The E&RC Team Leader, RC Coordinator, or the OSC Leader is responsible for providing information to the RCD pertaining to the execution of radiation protection and in-plant and on-site radiation monitoring activities during an emergency. (AR #61746)

4. The E&RC Team Leader, RC Coordinator, or the OSC Leader is also responsible for ensuring that Emergency Worker Dose Limits are correctly implemented and approved by Management. (AR #61746)

5. The E&RC Team Leader, E&C Coordinator, or OSC Leader is responsible for ensuring that chemistry sampling/analysis and monitoring activities are performed as needed to support damage assessment. (AR #61746)

8.3.3 INSTRUCTIONS

1. E&RC personnel assigned to the OSC shall report to the facility at the declaration of an ALERT or higher emergency classification or when requested to activate by the Site Emergency Coordinator (SEC).

8.3.3.2 (Continued)

2. Upon arriving at the OSC, an available E&RC Supervisor or assigned team member will perform the following:

   a. Establish communications with the RCD in the TSC.

   b. Prepare the E&RC work area in the OSC in conjunction with the OSC Leader.

   c. Assure that adequate E&RC staffing is available as indicated on the appropriate sections of the OSC tag board.

   d. Establish and monitor the habitability of the OSC.

   e. Report the E&RC Personnel accountability and state of readiness to the OSC Leader.

   f. Assure that a respirator qualification printout or an approved database is available and used by E&RC personnel issuing respirators.

   g. Ensure a sufficient number of TLDs and self reading dosimeters are available for use (SRPD or Electronic Dosimeters).

   h. Prioritize activities.

      – Attachment 8.3.5.1, E&RC Team Activity Priorities, presents a general outline of task priorities developed to address emergency situations.

3. Assign, brief, direct, and debrief any teams dispatched, as well as the personnel assigned to Plant Access Points, and Assembly Areas.

   a. These briefings may be done by ALARA Personnel, Specialists, Supervisors, RC Coordinators, or Lead Technicians.

8.3.3 (Continued)

b. For each monitoring assignment, brief the team members on the following:

- Monitoring and sample collection location(s);
- Required data;
- Anticipated radiological conditions;
- Required protective gear and dosimetry;
- Primary and alternate ingress/egress routes;
- Maximum stay times and radiation field limitations requiring special authorization.

4. Assign and dispatch personnel to the TSC/EOF to conduct dosimetry and habitability activities.

5. Sign any necessary OSC documents on behalf of the RCD.

6. If the OSC must be evacuated, and the back-up OSC established, assure that the E&RC status board, records, and necessary radiation monitoring and personnel protection equipment and supplies are available in the back-up OSC as described in EPOSC-01, Operational Support Center Leader.

7. If decontamination of personnel vehicles is needed outside the Protected Area, a special plan for this activity will be developed in conjunction with the RCD.

8. Complete Attachment 8.3.5.2, E&RC Activity Briefing Form. If a medical emergency exists, verbal authorization may be given for team dispatch as long as the information is documented in the OSC Team Leader log.

9. Update teams in the field on plant status, emergency level upgrades, etc.

8.3.4 **RECORDS**

N/A

8.3.5 **ATTACHMENTS**

8.3.5.1 E&RC Team Activity Priorities

8.3.5.2 E&RC Activity Briefing Form

ATTACHMENT 8.3.5.1
Page 1 of 1

E&RC TEAM ACTIVITY PRIORITIES (*)

1. Assign personnel to accompany Search and Rescue and First Aid: Life Saving Only
2. Set up OSC, including Fax machine
3. Assure habitability and badging of Emergency Response Facilities
4. In-plant surveys to calculate Initial Source Term
5. Provide personnel to accompany initial Damage Control Team and Support Operations
6. Provide personnel to monitor at the Access Control Point for Radiation/Contaminated Areas
7. Assign personnel to accompany emergency first aid and decontamination mission: not Life-saving
8. Provide personnel to accompany follow-up reentry teams
9. Personnel exposure control routine dosimetry assurance and completion of Special Radiation Work Permits
10. Place badges on fenceline
11. Release vehicles at plant entrances
12. Follow-up in-plant/onsite monitoring and sample collection
13. Sample analysis
14. Assign personnel to accompany minor First Aid and Decontamination

(*) This list of activity priorities is sequenced in a "likely order" for a fast breaking radiological emergency when personnel resources may be limited. Personnel assignments should be made as needed by the specific plant and personnel requirements.

ATTACHMENT 8.3.5.2
Page 1 of 1

E&RC ACTIVITY BRIEFING FORM

1. **Team Number:** _____

2. **Activity Description:** _____

_____

_____

_____

_____

3. **Team Member(s):** _____

_____

_____

_____

_____

4. Assigned personnel have been briefed on their activities, plant conditions, and necessary precautions. _____/_____
E&RC Lead Date

5. The RCD and OSC Leader have been notified and the E&RC Status Board has been updated. _____/_____
E&RC Lead Date

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PLANT OPERATING MANUAL

VOLUME 2

PART 5

EPPRO-05

SCENARIO DEVELOPMENT AND DRILL CONTROL GUIDELINES

REVISION 2

SUMMARY OF CHANGES

Step #	Revision Comment
Cover Page	changed format to replace Progress Energy with Progress Energy
Entire Procedure	change revision number to 2
Attachment 8.5.3.7 part B	Add item for lead controller to ensure simulator staff resets the simulator after pre-requisites are complete. (AR61873)
All pages	Renumber to AP-007 format.
All affected pages	Change - Supervisor - Emergency Preparedness to Emergency Preparedness Supervisor
All affected pages	Change CP&L to H.B. Robinson
8.5.3.14	correct typo, delete "s"
Attachment 8.5.3.13	Change SC EPD to SC EMD
Attachment 8.5.3.13	Correct numbering.

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8.5 GENERAL

NOTE: This document is an administrative guide for the development, conduct and assessment of drills and exercises. Specific circumstances or situations may dictate actions not specifically addressed in this document.

This document describes the recommended methods for the scheduling, preparation, conduct, and evaluation of Emergency Preparedness drills and exercises.

8.5.1 SCENARIO DEVELOPMENT

8.5.1.1 Scenario Development Team Composition

NOTE: Members of Training or other support units may substitute for one or more of the following, provided the individual has equivalent knowledge and experience, and the substitution is approved by the Emergency Preparedness Supervisor

1. A core team (required) for scenario development should be selected according to the following guidance:

   a. The Drill and Exercise Coordinator will be a member of the EP Unit, as assigned by the Emergency Preparedness Supervisor.

   b. Other members of the EP Unit staff will be responsible for coordination and completion of assigned areas of the scenario, including logistical support.

   c. One (1) analyst or other experienced member of E&RC, who works normal work week hours, will be assigned to the team and will:

      - Provide calculations and in-plant expertise associated with chemistry and radiological aspects of the scenario.

      - Assist with radiological and/or chemical plume distribution and deposition aspects of the scenario.

8.5.1.1 (Continued)

d. A minimum of two (2) experienced members of the Maintenance or work planning units, who work normal work week hours, will be assigned to the team. One member will have expertise in mechanical maintenance activities, and the other in electrical and I&C activities. These individuals are to be experienced with the current work management processes and will:

- Develop the materials necessary to simulate and evaluate plant assessment and damage control missions associated with the scenario.
- Assist with the development of equipment malfunction causes based on industry operating experience, Nuclear Plant Reliability Data System (NPRDS), and so forth.
- Manufacture, or otherwise develop, damage control mock-ups, as needed.

e. A member of Operations Support who holds or has held an SRO License or Certification at RNP. This individual will:

- Develop, with assistance from Robinson Operations Training, equipment malfunction sequences necessary to achieve the scope and requirements of the scenario(s) including "message card" details needed to maintain scenario continuity.
- Review plant response, procedures, and data to ascertain impediments to achievement of the goals and requirements of the drill or exercise.
- Provide altered plant data or instructions needed to ensure that participants will proceed through the scenario as expected/required.

8.5.1.1.1 (Continued)

f. A member of Robinson Operations Training with an SRO License or Certification at RNP and who is participating in Licensed Operator Continuing Training (LOCT). This individual must also be knowledgeable in the use of the training simulator and will:

- Assist Operations with development of equipment malfunction sequences necessary to achieve the scope and requirements of the scenario(s).
- Coordinate proposed event sequences and data within the capabilities of the training simulator.
- Review plant data, procedure transitions, and instructions, as needed, to provide a smooth running scenario.

g. A member of the RNP Simulator Support group will:

- Provide the primary support for initial "bounding" scenario sequences, utilizing the simulator development computer or training simulator.
- Provide support for parameter override capabilities and modeling to achieve the needed results for the scenario.
- Provide data capture and download resources to aid in manipulation and dissemination of data points needed for other calculations, and for back-up scenario data.

2. The core team may be augmented for specific scenarios to include the following disciplines:

a. A member of Operations who will provide drill-specific assistance for fire fighting and first aid related scenarios.

b. A member of Information Technology (IT) who will provide interface for necessary set-up and preparations of telecommunications and computer equipment and software.

c. A member of Engineering who will assist with equipment, maintenance, technical or analysis related aspects of the scenarios (such as Core Damage Assessment or Severe Accident Management).

8.5.1.1.2 (Continued)

d. A member of Security who will assist with scenarios pertaining to security-related Emergency Action Levels (EALs), or for scenarios designed to evaluate or practice security force activities as an element of the scenario.

e. Others, as may be specifically requested through the Emergency Preparedness Supervisor.

3. The Emergency Preparedness Supervisor should obtain concurrence for scenario development team assignments and approve the team composition prior to the end of the calendar year. Attachment 8.5.3.1 or an equivalent form should be used to document concurrence/approval.

8.5.1.2 Scenario Team Assignment Expectations

1. Team Members are expected to perform the following tasks:

a. attend scheduled scenario development meetings, critiques, and self-assessment roll-up meetings;

b. function as a Controller/Evaluator in drills/exercises as requested;

c. maintain all scenario development materials confidential and promptly report to EP any compromise of scenario elements, and;

d. develop scenario materials and mock-ups as assigned.

8.5.1.3 Scenario Development Planning

1. A schedule for development of the scenarios for the upcoming year should be created annually, based on the scope and objective requirements. This schedule should take into account:

a. Scenario content and complexity needed to accomplish drill or exercise requirements and goals.

b. Availability of previously developed scenario materials.

c. Scheduled plant outage and maintenance activities.

d. Plant personnel training schedules.

e. Simulator availability.

8.5.1.3.1 (Continued)

f. State and local government needs based on their level of participation.

g. NRC and FEMA materials submittal requirements (Evaluated Exercises only).

- 90 days prior to exercise: Exercise Objectives/Scenario Timeline Due to FEMA
- 75 days prior to exercise: Utility Exercise Objectives Due to NRC
- 45 days prior to exercise: Utility Exercise Scenario/Timeline Due to NRC

2. The Drill and Exercise Coordinator shall coordinate assembly of the scenario development team as needed to accomplish the development schedule.

3. The Emergency Preparedness Supervisor will obtain concurrence of development team assignments and approve the team composition.

8.5.1.4 Development of a Scenario Package

NOTE: For drills or exercises involving off-site participation or involving specific environmental related objectives, the development process may start with the definition of the desired off-site radiological and meteorological conditions, with back calculation of the desired source term at the release point.

1. Scenario Packages should be complete, comprehensive, and of sufficient detail to provide presentation of simulated plant and environmental conditions to the Participants.

2. NRC/FEMA Evaluated Exercise scenario materials should be validated, and scenario materials should be completed approximately one (1) week prior to the scheduled validation date.

8.5.1.4 (Continued)

3. Exercise scenario information is company confidential until after conduct of the exercise. As a result:

   a. Intentional distribution shall be limited to authorized reviewers;

   b. Unintentional dissemination of scenario information is to be prevented through use of appropriate control of developmental and completed materials, and;

   c. Electronic copies of scenario materials are not to be kept on network computer directories accessible by the Participants to avoid accidental dissemination of the materials.

4. Full Scale Drill scenario materials should be completed, if possible, so that the packages for use in the drill may be assembled approximately two (2) weeks prior to the scheduled drill date.

5. The development of a scenario for a full-scale drill requires consistent and cohesive presentation of plant parameters and other symptoms. As such, a well-planned approach to development of the scenario materials is important in order to minimize re-work. The team should:

   a. Define the major events, equipment malfunctions and any required radiological conditions based on the scope and objectives for a given drill or exercise.

   b. Define the operational data to be used for the scenario based on expected procedure usage, operator, and other in-plant responses.

   c. Use the simulator to estimate/bound initial assumptions associated with malfunctions and magnitudes.

   d. Use the training simulator to determine plant parameters of significance for the postulated scenario.

   e. Develop training drills that place emphasis on realistic scenarios that do not require a significant release of activity to off-site environs.

8.5.1.4.5 (Continued)

f. Develop scenarios that provide the operating staff the opportunity to diagnose and correct problems.

g. When feasible, in order to optimize resource needs, reuse or alteration of a previously generated scenario may be selected for drills.

h. Preparation:

- Review Scope and Objectives requirements for scenario.
- Determine if scenario content corrective actions are needed from previous use.
- Determine ERFIS data point or simulator modeling changes since last use. If any, determine impact. Verify damage control missions against current plant configuration and procedures.
- Update Fire and First Aid materials, if required.
- Verify logistics requirements are consistent with planned activities.
- Verify on-site and off-site radiation readings.
- Verify meteorological requirements.
- Verify procedure guidance verses captured data.

i. Scenario Package Assembly:

- Modify/update scenario materials, as needed.
- Update Drill/Exercise Scenario Manuals, as needed.
- Develop Self-Assessment and Evaluation Guidance Packages.
- Prepare drawings, charts or mock-ups as applicable for damage control and assessment missions.

8.5.1.4 (Continued)

6. When the scope and objectives of a drill cannot be satisfied through use of a previous developed scenario, a new scenario will be developed.

   a. Preparation Phase:

      - Review Scope and Objectives requirements for scenario.

      - Determine if corrective actions from previous drills need to be evaluated.

      - Provide an outline of scenario events to achieve requirements.

   b. Draft Scenario Phase:

      - Outline damage control missions using Passport work history, INPO OE items, recent NRC Region II Inspection findings, and existing damage control missions as input.

      - Prepare Fire and First Aid materials, if required.

      - Verify logistics requirements are consistent with planned activities.

      - Run simulator scenario.

      - Verify plant configuration and assumptions of scenario outline.

      - Refine timeline and Damage Control Mission assumptions.

8.5.1.4.6.b (Continued)

- Capture data associated with break flows, radiation monitor readings, radiological releases, and other pertinent information for bounding calculations.
- Check anticipated in-plant, on-site, and off-site radiation readings are within desired range.
- Determine meteorological requirements (such as stability class, wind speed or precipitation) to achieve desired radiological release implications.
- Check procedure guidance verses captured data.
- Identify any parameters (such as thermal/hydraulic, radiation and so forth) which may need bounding or massaging.

c. Materials Assembly Phase:

- Run refined timeline on the training simulator.
- Refine timeline to match actual simulator data run.
- Generate controlling and contingency message cards.
- Generate meteorological data and forecasts.
- Generate chemistry data.
- Generate in-plant radiological data.
- Generate on-site radiological data.

8.5.1.4.6.c (Continued)

- Generate off-site radiological data.
- Fine tune damage control mission packages.
- Generate back-up and contingency materials (for simulator failures, as needed).

d. Scenario Manual Completion Phase:

- Update Drill/Exercise Scenario Manuals, as needed,
- Develop self-assessment and evaluation guidance packages, and;
- Prepare drawings, charts, or mock-ups as applicable for damage control and assessment missions.

8.5.1.5 Scenario Manual Review and Validation

1. Because of the multiple aspects of a scenario, it is important that the finished product be thoroughly reviewed for completeness and consistency.

   a. It is recommended that the development team, as a group, go through all elements of the completed scenario manual.

   b. This should be accomplished through review and evaluation of the initial conditions, presentation of symptoms, resultant indications, re-review of anticipated questions, and participant requests for information through scenario termination.

   c. Attachment 8.5.3.4 or equivalent provides a checklist for accomplishment of this review. Attachment 8.5.3.5 or equivalent provides a means to annotate review of the scenario.

8.5.2 DRILL/EXERCISE CONTROL GUIDELINES

8.5.2.1 The Drill/Exercise Coordinator should ensure coordination and set-up for the drill/exercise in accordance with Attachment 8.5.3.6 or equivalent.

8.5.2.2 The Drill/Exercise Coordinator will designate personnel to complete Attachments 8.5.3.7 and 8.5.3.8 or equivalent, as applicable, to set-up the facilities or equipment.

8.5.2.3 Personnel designated as Lead Facility Controllers and Evaluators should complete Part A of Attachments 8.5.3.7 and 8.5.3.8 or equivalent.

8.5.2.4 Initiation and conduct of the drill or exercise:

1. Lead Facility Controllers should:

   a. Ensure distribution of applicable message cards and data packages to designated participants, in accordance with the timeline and Drill/Exercise Coordinator instructions.

   b. Control the sequence of events and the response of participants, as identified in the Controller/Evaluator briefing.

   c. Obtain concurrence of the Drill/Exercise Coordinator prior to permitting any significant deviation from the anticipated response.

   d. Ensure that participants, controllers, evaluators, and observers document their participation on appropriate facility rosters.

   e. Controllers should control the progress of the drill/exercise to maintain the scenario timeline and player response. Deviation from the scenario is not allowed unless authorized by the Drill/Exercise Coordinator.

8.5.2 (Continued)

2. Controllers assigned to simulate non-PROGRESS ENERGY activities, such as NRC, Mock Media, and so forth, should conduct their activities, in accordance with the instructions provided (Attachment 8.5.3.9, 8.5.3.10, 8.5.3.11, and 8.5.3.12 or equivalent instructions).

3. Evaluators should:

   a. Maintain a chronology of significant events and Participant responses in sufficient detail to provide an accurate record of activities.

   b. Use the evaluation criteria provided by the Drill/Exercise Coordinator to assess participant and/or facility performance.

   c. Inform facility lead controllers when scenario objectives are met.

4. Observers should comply with the instructions provided to them by the appropriate controller, ensuring that they do not interact with participants, or impact the conduct of the drill/exercise.

5. Participants should:

   a. Respond to the simulated sequence of events to the best of their ability.

   b. Comply with instructions provided by the appropriate controller.

   c. Note problems and recommendations for changes and bring them to the attention of Controller/Evaluator organization at the conclusion of the drill/exercise during the facility critique.

8.5.2 (Continued)

8.5.2.5 Termination of a drill or exercise will be coordinated through the Drill/Exercise Coordinator when any one (1) of the following conditions are met:

1. The drill or exercise timeline has been completed.

2. All Facility Lead Controllers have concurred with drill/exercise termination due to any of the following:

   a. Drill/exercise activities have been adequately evaluated.

   b. Problems or other unexpected occurrences warrant early termination.

   c. Performance of the drill or exercise is affecting plant, public, or personnel safety, or the occurrence of an actual emergency.

3. At the completion of the drill/exercise, Facility Lead Controllers and Facility Lead Evaluators should perform activities outlined on their checklists (Attachments 8.5.3.7 and 8.5.3.8 or equivalent) to assist with the conduct of the facility critique and restoration of the facilities and equipment.

4. The Drill/Exercise Coordinator should ensure that all emergency response facilities and equipment used during the drill/exercise are restored and the facilities are ready for activation (Attachment 8.5.3.6 or equivalent).

8.5.3 **ATTACHMENTS**

8.5.3.1 Scenario Development Team Assignments

8.5.3.2 Simulator Draft Scenario Phase

8.5.3.3 Simulator Materials Assembly Phase

8.5.3.4 Scenario Materials Completion Checklist

8.5.3.5 Scenario Review Form

8.5.3.6 Drill/Exercise Coordinator Checklist

8.5.3.7 Facility Lead Controller Checklist

8.5.3.8 Facility Lead Evaluator Checklist

8.5.3.9 NRC ENS/HPN Control Cell Checklist (Example)

8.5.3.10 Communications Control Cell Checklist (Example)

8.5.3.11 Mock Media Checklist (Example)

8.5.3.12 Concerned Citizen and Rumor Simulation Checklist (Example)

8.5.3.13 Controller/Evaluator Briefing (Example)

8.5.3.14 Participants' Briefing Sheet (Example)

Attachment 8.5.3.1
Page 1 of 1

Scenario Development Team Assignments

The below named personnel are responsible for RNP Emergency Preparedness Scenario development for the time period _____ through _____❶.

The responsibilities and expectations for the conduct of these duties are delineated in Section 8.5.1.1 of this procedure.

Core Team Responsibility:	Name:
Coordinator	
Lead Controller	
E&RC	
Plant Radiation	
Off-site Radiation	
Operations	
Operations Training	
Simulator Support	
Mechanical Maint.	
Elec/I&C Maint.	

Augment. Team Responsibility:	Name:
Fire Protection	
Info. Technology	
Engineering	
Security	
Public Information	
Other	

❶ A schedule of activities and tentative resource needs should be attached.

Team Composition Approval: _____

Simulator Draft Scenario Phase

_____ Initiate the simulator or development computer in the appropriate core life initial condition (IC).

_____ Establish malfunctions and other simulator instructions as needed.

_____ Establish a data capture routine on the simulator using the EP baseline group to initiate periodic log print function to obtain SPDS sheets for scenario specific parameters of interest.

_____ Extract training simulator captured data at 300-second intervals. This data can be downloaded into a computer spreadsheet or otherwise used to estimate, or bound, thermal hydraulic and chemistry related parameters of the scenario.

_____ Maintain a log of key activities performed as an aid in evaluation of data and development of the basic scenario time line.

_____ Print out alarms, instructor and operator logs as needed.

NOTE: *This checklist is for information only. No record retention requirements apply.*

Simulator Materials Assembly Phase

Simulator Related Activities:

_____ Initiate the training simulator exercise IC and verify ERFIS operation.

_____ Maintain a log of key activities performed as an aid in narrative of Control Room (CR) actions.

_____ Extract training simulator captured data at 300 second intervals. This data will be downloaded into a computer spreadsheet or otherwise used to estimate, or bound, thermal hydraulic and chemistry related parameters of the scenario.

_____ Print out alarms, instructor, and operator logs as needed.

_____ Insert substitute values in simulator program to feed ERFIS meteorological conditions for the drill.

STABILITY CLASS	DELTA-TEMP (DEG-C/100m)
A . . . 1	<.90
B . . . 2	-1.89 to -1.70
C . . . 3	-1.69 to -1.50
D . . . 4	-1.49 to -0.50
E . . . 5	- 0.49 to +1.50
F . . . 6	+1.51 to +4.00
G . . . 7	> 4.00

NOTE: *This checklist is for information only. No record retention requirements apply.*

Scenario Materials Completion Checklist

NOTE: This checklist is for information only. No record retention requirements apply.

DRILL/EXERCISE SCENARIO MANUAL:

☐ Review contents and verify compliance with current procedures and practices.

SECTION 1: INTRODUCTION

☐ Controller/evaluator organization specified.

☐ Participant briefing (extent of play, etc.)

SECTION 2: DRILL OBJECTIVES

SECTION 3: SCENARIO

☐ Scenario narrative and timeline - include major events, transitions, ERF activation, and emergency declarations.

☐ Scenario contains criteria for drill termination if applicable.

Subsection 3.1: Messages

Control Message Cards:

☐ Initial plant conditions and power history to be available to AAT-Reactor Engineer.

☐ Any external event not presented on the simulator.

☐ Any event occurrence observable in the plant.

☐ Contingency Emergency declaration cards.

☐ General Emergency card, and any other PAG exceeding events, provided reference to expected PARs.

☐ Each simulated action has been verified to have sufficient materials to provide participants with expected actions and communications, examples include:

- Message to Security that the ambulance has left the site
- Reports from HP tech that the patient is at the hospital
- Reports that contaminated materials are back in H.B. Robinson control following off-site medical treatment of a contaminated, injured patient
- State or County response actions such as park closings, school and day care closings (refer to State plan for actions)

- State or County news releases
- NRC response actions
- NRC news releases
- Accountability is complete
- Site evacuation is complete

☐ Key mock media or rumor control items.

☐ Message cards to used in the event that the simulator crashes - this includes radiation monitor alarms, information needed to insure operations personnel awareness of procedure usage/transitions to maintain consistency with back-up data sheets.

☐ Drill completion message cards:

- Collect attendance sheets
- Ensure external personnel notified of drill termination
- Verify that dosimetry is returned and logged back in
- Collect all qualification and re-qualification paperwork, logs, and records.
- Ensure that post use inventories of EP equipment and supplies are completed
- Conduct a player critique

Subsection 3.2: Plant Parameters

☐ SPDS Data available to provide information if the simulator fails during course of the drill.

Subsection 3.3: Meteorological Data

☐ Weather synopsis included.

☐ Data at 15-minute intervals.

☐ 1-hour, 3-hour, 24-hour, and three-day forecasts

Scenario Materials Completion Checklist

Subsection 3.4: Radiological and Damage Control Mission Information

Radiological aspects of scenarios including major releases, dose rate increases and/or classification/PAR changes.

Subsection 3.4a – Onsite Radiological Data

- ☐ On-site radiation data (normally should include each survey point, plume boundaries, and potential personnel transit paths).
- ☐ Verify consistency between on-site and off-site radiation data.
- ☐ Derivation or basis for the data is provided.
- ☐ Airborne concentrations, air sample results and contamination readings.
- ☐ Parameters altered from calculated are explained in basis.
- ☐ In-plant radiation, contamination and airborne radiation level maps.
- ☐ All expected activities are adequately addressed by the in-plant maps.
- ☐ In plant maps enable determination of ingress and egress routes to drill activities.
- ☐ Affects/information regarding opening of doors and affect on ventilation or radioactive material movement are included.
- ☐ Verify consistency between RMS data (15 minute printouts and data tables) and in-plant radiation maps.
- ☐ Derivation or basis for the data is provided.
- ☐ Continuous Air Monitor (CAM) and local Radiation Monitor readings are provided as applicable.
- ☐ Parameters altered from calculated are explained in basis.

Chemistry Data

- ☐ Normal, pre-event chemistry data is available.
- ☐ Table or overview provides time dependent RCS and secondary systems sample results include all indications and radiation readings needed to perform activity (includes a review of associated procedures).
- ☐ Table or overview provides time dependent PASS activity data.
- ☐ Data presentation sheets or forms for issuance to participants (mimic format and content of expected results of analysis).

Scenario Materials Completion Checklist

Chemistry Data (Continued):

- ☐ Verify consistency in Core Damage Assessment results and plant parameters (reactor water level and temperature vs. Chemistry vs. RMS).
- ☐ Locations are adequately addressed by the in-plant maps.
- ☐ In-plant maps enable determination of ingress and egress routes to drill activities.
- ☐ Description of the derivation or basis for the data.
- ☐ Parameters altered from calculated are explained in basis.

Subsection 3.4b – Offsite radiological data and maps showing plume exposure pathway.

- ☐ Data is adequate for scope for scenario and evaluation.
- ☐ Instrument types/ranges match those of the user (H.B. Robinson or state).
- ☐ Verify consistency between on-site and off-site radiation data.
- ☐ Compare dose projection results and environmental data, package ID's any major differences.
- ☐ Derivation or basis for the data is provided.
- ☐ Parameters altered from calculated are explained in basis.

Subsection 3.4c – Mission Cards

- ☐ Damage control missions are provided for applicable safety related equipment malfunctions.
- ☐ Damage control missions are provided for those non-safety related equipment malfunctions for which it is expected that the participants will dispatch teams.
- ☐ References list OEF items or other plant/industry events related to this malfunction, if applicable.
- ☐ Expected participant actions begin with determining the status of the equipment or system.
- ☐ Resultant indications present only that information which is obvious or available.
- ☐ Each successive participant action should be based on completion of the previous action.

Scenario Materials Completion Checklist

- ☐ Any limitations associated with resultant indications are included (for example, switch "A" must be held to the right while obtaining the reading) as an aid the controller assigned to the mission.
- ☐ Resultant indications do not include results of interpretation of the data. (assessment or resolution of the indicated condition is listed in "Controller Use only").
- ☐ Mock-ups, pictures, drawings or charts are included as needed to effectively present the symptoms.
- ☐ Information needed to assess the situation and proceed through repair, restoration, or determination that repairs are not feasible, is included.
- ☐ Locations are adequately addressed by the in-plant maps.
- ☐ In-plant maps enable determination of ingress and egress routes to drill activities.
- ☐ All major scenario events and transitions contain relevant information to guide personnel without providing prompting (instrument readings, audio/visual alarms, audio/visual indications).
- ☐ Verify operations data and damage control missions for consistency.

SECTION 4: CONTROLLER INSTRUCTIONS
SECTION 5: EVALUATOR INSTRUCTIONS
SECTION 6: SUPPLEMENTARY MATERIAL

Scenario Review Form

The below named personnel have reviewed the RNP Emergency Preparedness Scenario for the _____ Drill/Exercise.

By our signature, we certify acceptance of this document with changes or modifications annotated.

Area	Name:	Signature:	Comments:
General Information			
Drill Objectives			
Narrative Summary			
Radiological Summary			
Message Cards			
SPDS Data			
Maintenance Missions			
Off-Site Rad Data			
On Site Rad Data			
Met Data			
Chemistry Sample Data			
Area Rad Survey Maps			
Security			

❶ I have reviewed this scenario for accuracy and representation of expected plant responses. This scenario represents a sequence of events sufficient to exercise the identified drill/exercise objectives. This scenario does not attempt to describe actual or postulated real events for which the plant was specifically designed to mitigate. My review does not endorse the described events as real or projected. I understand that scenario confidentiality is important. I further agree not to describe the scenario details to anyone not on the development team.

_____

_____

_____

This information is for scenario validation only. No record retention requirements apply.

_____

Reviewed: Emergency Preparedness Supervisor / Date

Drill / Exercise Coordinator Checklist

PART A: LOGISTICAL AND PERSONNEL PREPARATIONS

Drill Date: _____

Greater than five weeks prior to the drill **Date:** _____

_____ Obtain Controller communication network (radios if appropriate)

_____ Review plant scheduled activities which are planned concurrent with the drill and resolve potential conflicts.

_____ Verify scheduling of resources for drill participation.

_____ If off-site agencies are participating, verify Site Communications is aware of the pending drill related activities.

_____ Obtain confirmation of level of support/interface from the following (as applicable):

_____ State and County Emergency Management

Agency	Response
Darlington County	
Chesterfield County	
Lee County	
State of South Carolina	

_____ State Department of Health and Environmental Services

_____ NRC Resident Inspectors

_____ Off-site fire, rescue, etc.

_____ Non-RNP resources

_____ Verify briefing, critique, and JIC room reservations.

_____ Determine the method of ERO notification (such as Pre-staged or Dialogic).

Three weeks prior to the drill **Date:** _____

_____ Distribute a site wide communication describing the date, time, and scope of the drill.

_____ Add drill dates and associated activities to the MRT Agenda.

Drill / Exercise Coordinator Checklist

PART A: LOGISTICAL AND PERSONNEL PREPARATIONS (CONTINUED)

_____ Compare the data obtained from the scenario validation and adjust the data obtained from the spreadsheet to agree with the RMS Data.

_____ Copy scenario materials for briefing with Controllers.

_____ Order meals, snacks and drinks for the drill (on-site and JIC).

_____ Prepare Controller/Evaluator Briefing materials. Ensure C/E packages include training rosters, on-call lists, drill phone numbers, feedback forms, etc.

_____ Verify commitment for Controllers and Evaluators.

_____ Obtain commitment for mock personnel, vehicles, etc.

_____ Coordinate level of support for drill activities prior to ERF activation (for example, Corporate/Site Communications, INPO, etc.).

_____ Obtain listing of I & C Maintenance, Mechanical Maintenance, Health Physics and Chemistry personnel who will be available as the "on-shift" staff at the start of drill.

_____ Coordinate required level of support/demonstration activities with Security.

_____ Remind designated ERO team personnel of the drill (i.e., via e-mail) and include pre-drill briefing materials.

_____ Coordinate needs of personnel to be qualified during the drill. Notify personnel via e-mail to bring qualification checklists with them.

<u>One week prior to the drill</u> **Date:** _____

_____ Coordinate arrangements with Access Control for individuals who will require badging or escorts, if applicable.

_____ Verify off-site agency and response personnel participation.

_____ Conduct a briefing with off-site agencies participating in the drill.

Drill / Exercise Coordinator Checklist

PART A: LOGISTICAL AND PERSONNEL PREPARATIONS (CONTINUED)

_____ If off-site personnel or equipment will be responding to the site, verify Security is notified of the need to evaluate planned response against the requirements of the Physical Security Safeguards Contingency Plan.

_____ Verify availability and preparations for pre-staging SCBAs, if applicable to the scenario. Make arrangements with HP for stocking the HP Kits in the Simulator and SCBAs in the AO work area.

_____ If the scenario is being driven from the simulator, when feasible, run the scenario on the simulator to verify no negative impact from any recent modeling changes.

_____ Notify Information Technology and Telecommunications to perform simulator setup per Attachment 10.3 of TAP-411 one hour prior to drill/exercise start.

_____ If applicable, define non-ERO required actions (such as accountability and identification of exempt personnel) and disseminate to the plant (via a routine communication method).

_____ Conduct Controller/Evaluator Briefing.

_____ Verify any Observers have been authorized and briefed.

_____ Verify pre-drill information has been disseminated to Participants.

_____ If 911 calls will be made as a part of the drill or exercise, contact the Darlington County Emergency Director/designee to alert them to the details and level of participation of off-site agencies.

Two (2) Days Prior to Drill **Date:** _____

_____ Charge Controller/Evaluator radios.

_____ Check facility locations for procedure quality and cleanliness.

_____ Notify Computer Support at the JIC to check the facility computers for proper operation.

Drill / Exercise Coordinator Checklist

One (1) Day Prior to Drill **Date:** _____

_____ Contact the State/Counties to remind them of drill date and times.

_____ Notify NRC Resident of drill.

_____ Notify Unit 1 (1284) and the Darlington County Plant (8 452-3397) about drill logistics.

_____ Check batteries in video system wireless microphones (9 volt).

Prior to Start of Drill:

_____ Brief Simulator Staff and crew. (see page 6)

_____ Brief Main Control Room Staff on Drill Scenario (see page 6)

_____ Verify computer terminals in the facilities are aligned to ERFIS.

_____ Verify Simulator Set-up per completed TAP-411, Attachment 10.3.

PART B: TERMINATION RELATED ACTIVITIES:

_____ Canvass each facility to ensure that all facility objectives have been met and issue the drill termination message via the EOF Lead Controller.

_____ Verify with the EOF Lead Controller that the drill termination message has been completed and transmitted offsite to the State/Counties prior to setting the simulator to freeze. (AR #57063)

PART C: POST DRILL OR EXERCISE RELATED ACTIVITIES:

_____ Notify the Main Control Room to announce drill termination.

_____ Contact Information Technology to return simulator to pre-drill setup per TAP-411, Attachment 10.3.

_____ Ensure facility inventory checklists have been completed.

Drill / Exercise Coordinator Checklist

PART C: POST DRILL OR EXERCISE RELATED ACTIVITIES:

_____ Coordinate completion of Draft Critique Report.

_____ Ensure Corrective Actions from critique report are entered into the Corrective Action Program.

_____ Drill/exercise documentation completed and filed as follows:

_____ Originals of drill rosters and drill package are submitted for transmittal to vault, as applicable.

_____ Ensure training roster information is updated.

_____ Maintain copies of rosters and other documentation to EP common files.

Drill / Exercise Coordinator Checklist

EP Drill/Exercise Briefing for Operations **Date** _____

Simulator Control Room

1. Discuss turnover information not included with scenario.
2. Provide name and phone number of Main Control Room contact, usually BOP Operator at 1443. BOP contact name _____
3. Discuss simulator setup
   - Phones/faxes swapped Yes/No
   - PA cross connected Yes/No ***If cross connected, use line 5***
4. Discuss items to be performed/simulated.
   - Local/site evacuation performed/simulated (circle one)
   - NRC Notification: Initial contact with the NRC resident and Operations Center are expected to be performed. **If the Resident/Ops Center choose not to participate, then further calls are to be made to the Mock NRC at 5095.**
   - Notify Chemistry of ≥ 15% power level changes. Prior to OSC activation, call **6248.** After OSC activation, notifications/requests should go through the TSC.
   - Prior to OSC Activation, call **HP at 6419, Maintenance at 6387, I&C at 6381.**
   - Other Drill Phone Numbers: **Operations** *(other than BOP)* **at 5004**
   - **Manual beeper activation will be used to set off the beepers.**
5. Training/Previous drill concerns

Main Control Room

1. Provide overview of drill scenario to Main Control Room CRSS/BOP.
2. Discuss expectations for broadcast of pre-scripted EP Drill messages and sounding of alarms following contact from Simulator Control Room ***or*** the Plant Operations Director (POD) in the TSC.
   - Calls will be made to the BOP from the Simulator Control Room ***or*** the Plant Operations Director (POD) in the TSC for drill scenario actions. Calls originating from any other point should be questioned. (AR #43155)

Facility Lead Controller Checklist

PART A: LOGISTICAL AND PERSONNEL PREPARATIONS:

One (1) day prior to the Drill or Exercise:

- ☐ Verify operability of Controller communications equipment.
- ☐ Walk through facility and verify all items are functional.
- ☐ Verify assigned Controllers are fluent with scenario materials and data to be presented.

Prior to start of drill:

- ☐ Test controller communications equipment.
- ☐ Check the PA volume and other facility communications equipment.
- ☐ Verify computer terminals in the facilities are aligned to ERFIS.
- ☐ Verify appropriate and adequate documentation is provided.
  - ☐ Participant Phone List
  - ☐ Facility Training Roster
  - ☐ Controller Phone List
  - ☐ EP Improvement Forms
- ☐ Verify Controllers and Evaluators are present, properly briefed, and identified.
- ☐ Notify Drill and Exercise Coordinator of readiness to begin the drill or exercise.
- ☐ Set up snacks, as applicable.

PART B: TERMINATION RELATED ACTIVITIES:

- ☐ Data presentation sheets or forms for issuance to participants (mimic format and content of expected results of analysis).
- ☐ Issue the Drill/Exercise termination message at direction of Drill and Exercise Coordinator.
- ☐ Ensure that all ERO members stay for the critique, including administrative and support personnel.
- ☐ After the termination message is complete and the facility logs have been printed ensure the simulator is reset. This can be done by notifying the Simulator Staff via the Drill / Exercise Coordinator.
- ☐ Verify that all Participants, Controllers, and Evaluators have signed in on the rosters.
- ☐ Assist Facility Leader with conduct of the Participant's Critique.

Facility Lead Controller Checklist

- ☐ Provide preliminary feedback to the Participants from the Controller/Evaluator perspective.
- ☐ Assemble the Controller/Evaluator staff from your facility.
- ☐ Debrief the Controllers and Evaluators in preparation for critique of the drill or exercise.
- ☐ Determine if any significant Deficiencies or Weaknesses appear to have been identified.
- ☐ Verify post-use inventories of Emergency Response Facility equipment are completed.
- ☐ Return the controller communications equipment to storage.
- ☐ Facilitate the Lead Evaluator Critique.

Facility Lead Evaluator Checklist

PART A: LOGISTICAL AND PERSONNEL PREPARATIONS:

Prior to the Drill:

The Facility Lead Evaluator should:

- ☐ Attend the Controller/Evaluator Briefing prior to the drill/exercise.
- ☐ Ensure a thorough understanding of the scenario.
- ☐ Perform a walk-down of their facility or area prior to the drill/exercise and review applicable procedures.

PART B: TERMINATION RELATED ACTIVITIES

Participant Critique

The Facility Lead Evaluator (SCR, TSC, OSC, EOF, JIC) should:

- ☐ Initiate the Participant Critique following termination of the drill/exercise.
- ☐ Turn over conduct of the critique to the Facility Leader.
- ☐ Collect all documentation from the drill/exercise (logs, records, forms) for transmittal to the Drill/Exercise Coordinator.

Controller/Evaluator Critique

The Facility Lead Evaluators should:

- ☐ Initiate the Controller/Evaluator Critique following the Participant Critique.
- ☐ Reconstruct timeline versus sequence of events in scenario, if necessary, to identify specific issues.
- ☐ Assess ERO performance and compare Controller/Evaluator evaluation with that of Participants.
- ☐ Complete the critique roll-up form for the affected facility using input from Participants, Controllers, and own observations.
- ☐ Identify objectives as either Met or Not Met.
- ☐ Consolidate and categorize identified critique items as Strengths, Issues, Weaknesses, or Items for Management Consideration in preparation for the Lead Evaluator Critique.

Facility Lead Evaluator Checklist

Lead Evaluator Critique

- ☐ The EP Supervisor (or designee) should chair the critique with Facility Lead Evaluators in attendance.
- ☐ The EP Supervisor (or designee) and Facility Lead Evaluators should:
  - a. Review Participant and Controller/Evaluator critique comments.
  - b. Validate/categorize critique items as:
    - Strengths
    - Issues
    - Weaknesses
    - Items for Management Consideration
- ☐ The Drill/Exercise Coordinator will begin development of the Drill/Exercise Critique Report per EPPRO-01.

NRC ENS/HPN Control Cell Checklist (Example)

- ☐ Verify blank copies of the NRC notification forms (AP-030, Attachment) are available for receipt of calls.
- ☐ Monitor simulator for significant plant changes. After the ERDS data link is established, the NRC has access to the parameters listed on the following page. Use this information to ask questions if you are notified of significant changes in plant status within a reasonable amount of time.
- ☐ After significant plant problems are known, or at least one fission product barrier is breached, coordinate with the Lead TSC Controller and inform the ENS Communicator that a site response team will be sent to the site, pick a number of personnel from 8 - 15, and a time of approximately 2-3 hours or near the end of the drill.
- ☐ After 2 or more fission product barriers are breached, coordinate with the Lead TSC Controller and inform the ENS Communicator that the site response team size is being increased to 45 - 60 to support 24 hour staffing.
- ☐ Simulated ENS (Event Notification System) communications should include plant response information. Refer to following excerpt from NRC IN 98-08 for example communication items:

The level of communication between NRC and the licensee will depend on the development and the significance of the event. The following is a list of sample questions, which are not exhaustive, that may be asked during an emergency:

1. Is there any change to the classification of the event? If so, what is the reason?
2. What is the ongoing/imminent damage to the facility, including affected equipment and safety features?
3. Have toxic or radiological releases occurred or been projected, including changes in the release rate? If so, what is the projected on-site and off-site releases, and what is the basis of assessment?
4. What are the health effect/consequences to on-site/off-site people? How many on-site/off-site people are/will be affected and to what extent?
5. Is the event under control? When was control established, or what is the planned action to bring the event under control? What is the mitigating action underway or planned?
6. What on-site protective measures have been taken or planned?
7. What off-site protective actions have been recommended to State/local officials?
8. What is the status of State/local/other Federal agencies? responses, if known?
9. If applicable, what is the status of public information activities, such as alarm, broadcast, or press releases (licensee/State/local/other Federal agencies)? Has a Joint Information Center been activated?

NRC ENS/HPN Control Cell Checklist (Example)

- ☐ Also on the simulated ENS, until the HPN phone is manned, obtain dose projections, environmental monitoring results, chemistry analysis, and source term determinations.
- ☐ If a release is occurring, or expected, request that the HPN (Health Physics Network) phone be manned, if you can handle communications on both lines (see next item).
- ☐ HPN information should include:
  - Meteorological conditions (current and projected)
  - Dose projection results

- Meteorological Conditions **Current:**
  Forecast:
- Dose Projection Results

	Site Boundary	1 Mi.	2 Mi.	5 Mi.	10 Mi.
TEDE					
CDE					

- Release pathway:
- Source term:
- Results of atmospheric / environmental monitoring (dose rates, contamination, isotopic analysis):

Communications Control Cell Checklist (Example)

- ☐ Review EPNOT-01 for conducting State and County notification activities.
- ☐ Verify blank copies of the State/County Emergency Notification Forms are available for receipt of calls.
- ☐ Verify availability of current Authentication Code Words.
- ☐ Verify drill/exercise use telephone(s) operational.
- ☐ Closely monitor and log the time of initiation and completion of each call or notification received.
- ☐ When responding to the roll - call for notifications, respond as each of the following:
    1. State of South Carolina
    2. Darlington County
    3. Lee County
    4. Chesterfield County
- ☐ When the Drill/Exercise Participant (Communicator) gets to line 4 of the Emergency Notification Form, he/she should request the State to provide an authentication number. When this occurs, or if not requested - when information from line 4 is read, notify the communicator that "the State requests authentication for Number _____." The Communicator should provide the proper word from the Authentication Code List.
- ☐ Each time a notification is received, use a different Authentication number.
- ☐ Monitor communications and Emergency Notification Forms for completeness, accuracy, and proper use of layman's terminology.
- ☐ Monitor to ensure that any of the following items are reported:
- ☐ Estimate of any surface radioactive contamination in plant, on-site or off-site.
    - ☐ RNP emergency response actions underway (for example, relocation of site personnel).
    - ☐ Any requests for assistance (for example, Rescue, Fire or Sheriff).
    - ☐ Monitor for proper use of Initial or Follow-up message designations and message numbering.
    - ☐ Monitor for notification of drill/exercise termination.

Mock Media Checklist (Example)

BADGING:

- ☐ Enter the media briefing area.
- ☐ Obtain a "mock media" badge from the Admin/Media Badging Specialist, located at the entrance to the news media briefing area, identify yourself as mock media.
- ☐ Wear the "mock media" badge at all times, it is important that drill/exercise participants know that you are participating as "mock media".
- ☐ Continue to check the media badging table if the Admin/Badging Specialist is not in place upon your arrival.
- ☐ Obtain copies of news releases and/or other available information from the Admin/Badging Specialist.
- ☐ When you leave the news media briefing area, return your badge to the Admin/Badging Specialist.

NEWS MEDIA BRIEFING AREA:

- ☐ Mock media will spend their time in this area.
- ☐ This is the area where spokespersons from all participating agencies will conduct news media briefings.
- ☐ News releases will be posted in this area.

MEDIA PHONES:

- ☐ Telephones for use by the actual media and/or "mock media" are located in the news media briefing area.
- ☐ Make calls to the JIC Public Information Specialists located in the Joint Information Center Support Room. This number(s) will be provided to you via a news release.

CONDUCT:

- ☐ When talking to drill or exercise participants, let them know who you are and what company/agency you are associated with (for example, CNN, ABC, NBC, API).

Mock Media Checklist (Example)

MAKING CALLS:

NOTES:

- Begin and end all telephone communications with **"THIS IS A DRILL"** message.
- Utilize only that information which you have been provided by the drill participants, or related simulated activity message cards. The media would not have access to the time line or other scenario development materials.
- Telephone calls are not to be initiated until after the JIC has released the telephone numbers, or as otherwise directed by the JIC Lead Controller.

1. It is your role to make calls to the specified telephone numbers and portray the news media. Please, be creative! Sample questions are provided on the following pages. Use these as guidance but also be creative and develop questions of your own.
2. It is preferred that many of the questions be based on recent news releases, EAS messages and Press Conferences (either actual, or message card driven).
3. Ask for clarification of any items that would not be clearly understood by someone with a 3rd grade education.
4. Ask for information regarding any of the following if not provided (when appropriate):
   - ❑ Current emergency conditions
   - ❑ Current emergency classification
   - ❑ How to maximize protection when sheltering
   - ❑ Instructions for transients without shelter
   - ❑ What to leave behind when evacuating
   - ❑ What to take when evacuating
   - ❑ Evacuation Routes
   - ❑ Location of Reception Centers
   - ❑ Info for parents of students impacted
   - ❑ Info for transportation-dependent individuals
   - ❑ Info for special populations
   - ❑ Rumor control telephone numbers
   - ❑ Information to address false or misleading rumors
   - ❑ Use of public information brochure and calendar
5. Monitor for:
   - ❑ Accurate Information
   - ❑ Clear and understandable language
   - ❑ Content consistent with public information brochures and calendar
   - ❑ Consistent information regarding information and instructions regarding protective action decisions
   - ❑ Clear differentiation between previous and current information and instructions
6. Up-to-date information

Mock Media Checklist (Example)

SAMPLE QUESTIONS to PROGRESS ENERGY:

NOTES:

- Begin and end all telephone communications with "**THIS IS A DRILL**" message.
- Utilize only that information which you have been provided by the drill participants, or related simulated activity message cards. The media would not have access to the time line or other scenario development materials.
- Telephone calls are not to be initiated until after the JIC has released the telephone numbers, or as otherwise directed by the JIC Lead Controller.

1. What is PROGRESS ENERGY doing to fix this problem?
2. Why did it occur?
3. Was this emergency due to personnel error?
4. Isn't it true that this is the worst nuclear power plant accident in the history of nuclear power? How could Robinson let this happen?
5. I've heard my neighbors discuss how bad it is at Robinson and how employees have such bad attitudes and are so overworked. Is that why this emergency occurred?
6. How will PROGRESS ENERGY replace the power that will be lost by the shutdown of Robinson? Will the shutdown be permanent?
7. What are your expectations for total cost for the emergency? Who will pay...rate payers? stockholders?
8. Is there a release of radiation? How much? Is it iodine? How do I explain this to my readers/listeners?
9. What is a dose projection? What is an actual reading? How do the two compare?
10. How do the actual field readings compare to what we receive everyday as background or manmade radiation?
11. Will the CEO be available for an interview? What about Robinson Senior Management?
12. What is the NRC doing? Are they at the plant? Are they taking over the response or do they agree with PROGRESS Energy's efforts?
13. How are you planning to clean up the radiation? What will be done with it?

Mock Media Checklist (Example)

SAMPLE QUESTIONS to the COUNTIES: (ask each county individually the following questions)

NOTES:

- Begin and end all telephone communications with "**THIS IS A DRILL**" message.
- Utilize only that information which you have been provided by the drill participants, or related simulated activity message cards. The media would not have access to the time line or other scenario development materials.
- Telephone calls are not to be initiated until after the JIC has released the telephone numbers, or as otherwise directed by the JIC Lead Controller.

1. What is _____ county doing to protect its residents, school children, pregnant women, and so forth?
2. Where are the reception centers (directions)? How many persons will each reception center hold? What time will the centers be open? Can we take pets? Then, what do we do with our pets?
3. How will you decontaminate vehicles, homes, property, people, animals, livestock? What will be done with the radiation/contamination?
4. What is being done with individuals in rest homes? Where will they go? Directions? How will they be cared for? How will their families find them?
5. What is being done at the schools? Where are they being taken?
6. What about the Lake Robinson? How are these people notified? What about their boats? How are these people and their property decontaminated? What is done with the radiation/contamination?
7. How can you be sure that individuals are being kept out of the area? Is law enforcement forcing people out of their homes?
8. How is it assured that homes and businesses are protected from looters? How can looters get into the area? Isn't law enforcement controlling access to the area?
9. What can we take to a reception center?
10. What does a person do to shelter in place?
11. Are you nuts! Do you think for one minute that I am not going to pick up my child? I am going to pick up my child now, so where is he/she? Boy, are you ever going to have a lawsuit on your hands!

Mock Media Checklist (Example)

NOTES:

- Begin and end all telephone communications with "**THIS IS A DRILL**" message.
- Utilize only that information which you have been provided by the drill participants, or related simulated activity message cards. The media would not have access to the time line or other scenario development materials.
- Telephone calls are not to be initiated until after the JIC has released the telephone numbers, or as otherwise directed by the JIC Lead Controller.

SAMPLE QUESTIONS to the STATE OF SC:

1. When will the governor be available for an interview?
2. How is the state responding to this emergency?
3. Do you agree with PROGRESS Energy's actions? Is PROGRESS ENERGY really keeping the state informed? How do you know? PROGRESS ENERGY could be hiding information from the state just like they do with the media and public?
4. What should farmers do?
5. What should the public do?
6. Are you obtaining radiation readings? What are they? Where are they? What do they mean? How do these compare with radiation received everyday?
7. How many agencies are involved from the state? Who are these agencies? What are they doing? Where are they located? How can they be contacted for interviews?
8. Is this a state of emergency/disaster? Is FEMA available? Will assistance be offered like after hurricanes or natural disasters?
9. Is the State helping the counties? How?

SAMPLE QUESTIONS to the NRC:

1. Do you agree with PROGRESS Energy's response to the emergency?
2. Will PROGRESS ENERGY receive a fine? If so, how much? When will you know?
3. Will Robinson be shut down permanently?
4. What is the NRC doing to respond? How many people are here with the NRC? Where are they?
5. Is the President's office involved? Will he be coming to the Robinson Plant?

Concerned Citizen and Rumor Simulation Checklist (Example)

It is your role to make calls to the specified telephone numbers and portray the role of the general public.

NOTES:

- Begin and end all telephone communications with **"THIS IS A DRILL"** message.
- Utilize only that information which you have been provided by the drill participants, or related simulated activity message cards. The media would not have access to the time line or other scenario development materials.
- Telephone calls are not to be initiated until after the JIC has released the telephone numbers, or as otherwise directed by the JIC Lead Controller.

1. In order to effectively evaluate or train on rumor control activities, there must be:
   - at least six (6) calls per hour received per participating agency, prior to JIC activation.
   - at least six (6) calls per hour received per staffed telephone following JIC activation.
2. Pre-planned rumors will be provided during the pre-drill briefing or by the JIC Lead Controller.
3. Refer to the Mock Media Checklist for additional sample questions.
4. Rumors which focus on radiation, worker fatalities, public fatalities, and economic implications are preferred.
5. Rumors should be:
   - recurrent, to allow the JIC staff to evaluate for important trends in rumor related activity; and
   - some should be obscure and isolated.
6. Any additional rumors need to be authorized by the JIC Lead Controller and Drill and Exercise Coordinator.

Controller/Evaluator Briefing (Example)

1. **Introduction** - Controller & Evaluator Introductions

2. **Controller / Evaluator Packages**

   - **Observer Guidelines** - Observers should talk only with a controller

   - **Rosters** - ensure everyone signs on a drill roster

     * C/Es get credit for the drill IF they are evaluating their ERO position AND they sign on the drill roster.

     * Observers sign roster as an observer to receive training credit.

     * Candidates should sign roster as a participant.

3. **Conducting a Training Drill**

   Coaching - Coaching is instructing a participant by answering questions. It is best to guide the participant in the right direction by answering a question with a question to allow the participant to acquire the answer on their own.

   Example -

   Participant: "How often should we notify off-site agencies?"

   Controller: "What procedure would you use to find that information?"

   Prompting - Prompting is directing a participant to perform an action that appears to have been overlooked. Prompting should occur only as a last resort to prevent negative training. If prompting, try to offer the instruction as a question for the participant to consider.

   Example - No communications with the JIC are apparent, and no activities are occurring to generate a news release in the EOF.

   Controller: "How are we keeping the media and public informed of these events?"

   Documentation - When prompting is required, it should be documented in the critique process..

4. **Drill Evaluation Criteria**

Use the Drill Evaluation Criteria to assist evaluating the drill against the Drill Objectives/Acceptance Criteria. Each facility has a checklist of a few pages long. By verifying the items are evaluated and successfully completed or not performed, the Objectives can be documented as Satisfactorily Met or Not Met. A Comment Sheet is in the back of the section for additional comments. This will be used for future documentation on the drill and to facilitate the Drill Critique process.

5. **Conduct of Critiques**

Participant Critique - Immediately following drill (In each facility) **Controller/Evaluator Critique** - Following Participant Critique (In each facility)

6. **Lead Controller/Evaluator Critique** - Wednesday, 1/16/02, at 1400 hours in Rm 216.

We will discuss major items that are observed during the drill. Each Facility Lead Evaluator should be prepared to discuss his/her facility in a presentation lasting **15-30** minutes. The discussion should center on major items. Items for consideration (minor equipment problems or suggestions for improvements) should be documented but not discussed. Order of Presentations: Control Room, TSC, OSC, EOF, JIC and Communications

7. **Drill/Exercise Package**

Objectives

Initial Conditions

Timeline

Communications Equipment (Radios, Cell Phones)

When discussing the drill on the radio remember to use **"This is a drill message."** Use Message numbers when possible to refer to events within the drill to prevent participants from overhearing information.

Controller/Evaluator Briefing (Example)

Radio Contact:

To keep all facilities current on the drill, please announce "To all drill controllers" any of the following:

1) Each message card as it is issued

2) As we approach and reach an EAL classification

3) Each OSC mission that is dispatched and when it returns

8. **Level of Play** Control Room, TSC, OSC and EOF Environmental Monitoring Teams will collect samples. Make all PA announcements. If Simulator fails, Lead Controllers will pass out SPDS data. All personnel should report to their assigned Emergency Response Facility at **0800 (NO call out)**. Candidates should report to their assigned Emergency Response Facility at 0800.

Simulations*

JIC will be a Control Cell*

PASS/Chemistry - dispatch team to perform sampling missions but simulate drawing a sample. Operations personnel in the Simulator should manipulate valves to allow drawing a sample.*

Notifications: 911 - Inform Lead Controller *

Simulate Fire Brigade response to fire events*

Simulate Site Evacuation and alarms

NOTE: Eating and Drinking ban will **NOT** be simulated.

9. Off-site Agency Participation (See Participant Phone List)

   Notify State/County EOCs. Warning Points will **not** participate. **Use Selective Signaling to call the EOCs.** If advised that an EOC can no longer support the drill, inform the Lead Controller or Communications Evaluator.

   PARTICPATING AGENCIES:

   Darlington County

   Lee County

   Chesterfield County

   South Carolina Emergency Management Division

   DHEC

   NRC notifications will be made to a controller (do **not** use ENS and HPN phone numbers).

   INPO & ANI - make calls per procedure

10. SAFETY:

    Ensure personnel safety first and foremost.

    Maintain good ALARA practices throughout the drill.

    Environmental Monitoring teams should be safety conscious on the highways.

11. Collect all drill paperwork including a copy of all logs at the conclusion of the drill. All Simulator logs (SEC and Emergency Communicator, etc.) must be included with the drill package.

12. At the conclusion of the drill, ensure all facility deactivation steps have been completed and facility is ready for immediate activation (Example: whiteboards are erased).

Controller/Evaluator Briefing (Example)

13. At the conclusion of the drill, have Admin Support personnel perform Inventory Checklists in EPPRO-02 (OSC/TSC/EOF/JIC) as appropriate to be collected by Lead Controller.

14. **Controller / Evaluator Arrival Times**

    Simulator – 0630

    TSC – 0730

    OSC – 0730

    EOF – 0730

    JIC – 0900

Closing Comments

Participants' Briefing Sheet (Example)

PARTICIPANT GUIDELINES

1. Maintain status boards, log books, communication forms, etc, in as much detail as possible. Document all actions. Remember, if the Evaluator does not see it, *you did not do it. Put it in writing.*

2. Periodically identify key actions and decisions to the Controller and Evaluators. Ensure that the Controllers and Evaluators are aware of reference to procedures; and that they can give you credit for your thought process. This may seem artificial, but it will assist in the evaluation process, and is the Participants' chance to excel.

3. Participants should play out their emergency response fully. Radiological monitoring teams, search and rescue teams, emergency repair teams, etc, ... should be deployed, as appropriate. Controllers will NOT provide information to Participants for use in determining response actions or resolving problems unless Participants take action necessary to obtain information through their own organization.

4. Participants may ask Controllers for information or clarification of scenario data.

   Examples are:

   - Initial condition of systems including: system status and availability valve line-ups, chemistry and radiological activity operating history, meteorological data, e.g., wind direction, speed, temperature, and forecasts.

   - Operational parameters and indication. Area radiation data. Airborne data at locations where sampling has been performed. Isotopic data resulting from sample analysis. Data normally obtainable from emergency response facility computers.

Participants' Briefing Sheet (Example)

NOTE: In order to comply with scenario time limits, analysis data may be provided sooner than analysis would normally take to complete. This is to permit actions/decisions to be made based on the analysis results.

5. Participants may **NOT** ask for the following from Controllers:

   - Information contained in procedures, drawings or instructions.
   - Determinations of which procedures to use.
   - Data not normally available.
   - Assistance in activating facilities.
   - Assistance in performing emergency response.
   - Assistance in repairing, replacing or substituting emergency response equipment, i.e., telephones, fax machines.
   - Explanation of scenario events.

6. Some Participants may insist that certain aspects of the scenario are unrealistic. Scenario events and timelines are designed to permit demonstration of specific objectives. It is NOT always possible to be realistic, but events are plausible.
7. Remember that the Emergency Plan requires a multitude of participants; and all facets of the organization must be tested. There may be some introduced artificiality's during the drills / exercises.
8. If you disagree with a Controller, you may request reconsideration or seek advice from the Lead Controller. Under NO circumstances are you to argue or indulge in theoretical discussions with the Controller.
9. You must **NOT** accept any data, message or instructions from Evaluators or Observers, including Federal Evaluators.
10. If Evaluators want to initiate actions, test individual abilities, or interject a "surprise", they must work through a Controller.

Participants' Briefing Sheet (Example)

11. If a Controller intervenes with emergency response actions, it is for a good reason.

12. Follow the Controller's direction at all times. This is essential for the overall success of the drill/exercise.

13. Participants must respond as if any radiation hazards presented by the scenario are actually present. This includes, but is not limited to, the following:

    - Wearing of dosimetry and protective clothing.
    - Observing good radiation protection practices.
    - Minimizing radiation exposures.
    - Responding to failed instruments in the field
    - Reporting radiological hazards to proper personnel
    - Proper contamination control, i.e., rad waste, eating, smoking, food deliveries
    - Moving upwind/crosswind from venting smoke or known airborne plumes.

14. Maintain a professional attitude throughout the drill/exercise. Dead times may arise when scenario events are exercising other areas of emergency response. Use this time to clean up work areas. Minimize socializing.

15. Intentional violations of Federal, State or local laws are NOT permitted. All local traffic laws, especially speed limits, must be observed.

16. Termination of drill/exercise activities will be authorized by the Drill/Exercise Coordinator.

17. Listen closely to all PA announcements.

18. One of the main purposes of the drill/exercise is to identify areas requiring improvement to increase the overall effectiveness of Emergency Preparedness at RNP.

19. Following termination of the drill/exercise, participate in the facility critique.

20. If any facility equipment is inoperable and requires attention to place in an operable or stand-by condition, report information to the Facility Lead Controller for follow-up.

21. *All* logs, journals, worksheets, checklists and other documentation completed during the drill/exercise must be retained and turned over to the Facility Lead Controller at the critiques.

SAFETY

1. Ensure personnel safety first and foremost.

2. All normal RNP rules and procedures will be followed when entering actual radiological controlled or radiation areas.

3. NO ONE, including Controllers, Evaluators and Observers, is exempt from normal site radiological practices and procedures.

4. Actual emergencies take precedence over all drill/exercise activities. If a real emergency occurs during the drill/exercise, the emergency will be reported to the Site Emergency Coordinator. If the decision is made to terminate the drill/exercise, the Lead Controller in the TSC should inform the Drill/Exercise Coordinator in the Control Cell who will then notify all other Controllers of the situation and decision to terminate. The situation may require the drill/exercise to be put on "hold" for a period of time and resumed when the emergency is terminated.

5. Personnel will be informed of status via the Plant Page system.

6. Participants would also be informed by their Controller.

7. Protection and safety of employees, the public and the environment shall be the primary concern at all times.

Participants' Briefing Sheet (Example)

8. Participants may be permitted liberal "free play" in their response. However, Controllers, after making note of actions to be taken, may prohibit certain actions to maintain the appropriate response within the planned scenario and timeline.

9. Some areas of emergency response may be limited to protect personnel and equipment.

10. Participants must not operate, manipulate, or implement repairs on installed plant equipment or valves.

11. Participants must not enter into actual High and Very High Radiation Areas.

12. Appropriate onsite Participants should demonstrate use of SCBAs once, but must not discharge air tanks.

13. Fire hoses must NOT be charged.

CONTROLLERS AND EVALUATORS

1. Controllers & Evaluators for the drill (See attached listing)

2. Participants should not talk with Evaluators or Observers.

3. Participants may ask questions of Controllers for drill-related information only. Questions should be limited to information normally available to ERO personnel in a real event.

4. Observers and Evaluators should not talk to Participants.

PARTICIPATING FACILITIES AND DRILL INFORMATION:

1. Simulator Control Room, TSC, OSC, EOF, and JIC. If Simulator fails, the Facility Lead Controller will pass out SPDS data in Simulator only.

2. Make all PA announcements on the Plant PA System. (Begin and end communications with "This is a drill message.").

Participants' Briefing Sheet (Example)

3. There will **NOT** be an actual Site Evacuation. If drill conditions warrant a Site Evacuation, the Site Evacuation alarm will be sounded . Accountability is expected to be performed

DRILL TIMES:

All ERO personnel should report to their facilities as directed by Plant PA or beeper activation.

OFF-SITE AGENCY PARTICIPATION

1. Participating Agencies: Darlington, Lee, Chesterfield Counties, State of South Carolina, DHEC. If advised that an offsite agency can no longer participate, inform the Lead Controller or Communications Evaluator.

2. NRC notifications: Make actual notifications to NRC Operations Center. There will be NRC Response Team members participating in the various facilities.

3. INPO & ANI: Make calls per procedure.

4. Weather Information: The simulator will provide ERFIS meteorology. Do **NOT** use live Met Tower readings

SIMULATIONS:

5. Participants may request and obtain additional data or information from Controllers that would normally be available upon completion of the appropriate actions.

6. All communications (public address announcements, telephone, facsimile, radio) and any notifications made to offsite agencies should begin and end with -This is a Drill-. This phrase should also be repeated at frequent intervals to ensure intercepted transmissions do not cause public alarm.

7. Note: Ensure use of correct radio channel when transmitting via radio. Unless authorized by a Controller, no actions may be simulated.

8. If authorized to simulate an action, tell the appropriate Controller or Evaluator how and when you would normally perform the simulation at the time of the action. Simulation involves identification and explanation of required actions and procedures.

Participants' Briefing Sheet (Example)

9. Actual performance involves deployment of resources and physical implementation of procedures.

10. Controllers use time-related messages as the mechanism of initiating, orchestrating, modifying and completing scenario events. Operational and radiological data are also issued through time-related messages. Accept these messages immediately. They may contain scenario information essential to your successful performance.

11. Participants are responsible for coordinating with their Controller before being dispatched into a facility or out into the field. The Controller may have data that *is* vital to scenario events. This is of paramount importance to the success of the drill/exercise.

12. PASS/Chemistry: Request OSC Rad. Controller to perform sampling missions.

13. Any building or Site Evacuation will be SIMULATED. All Evacuation Alarms will be initiated in the Main Control Room.

COMMUNICATIONS:

1. Remember to use "This is a drill message" for communications outside the facility or that could be heard by personnel outside the facility.

2. Refer to procedure and the ERO Phone Book for phone numbers not listed in Participant Phone List.

3. The Plant PA CANNOT be used to page the Control Room Simulator, use phones.

4. The ARD phones in facilities are live and can be used.

5. Challenge data and info that does not appear valid through established communications channels. If information is confirmed but does not appear correct, request clarification from Facility Lead Controller.

Participants' Briefing Sheet (Example)

DRILL CONCLUSION:

1. Sign the drill roster in each facility in which you participate. Observers should sign the roster as an observer to receive training credit.

2. Observers do NOT interface with participants. Observer questions should only be directed to a Controller.

3. Turn all drill paperwork over to the Lead Controller. This includes copies of logs.

4. Ensure all facilities are left clean (i.e. trash and drink cans placed in applicable containers), and facility re-arranged as it was prior to start of the drill.

5. Ensure all TSC, OSC, EOF, and JIC facility deactivation steps have been completed, and the facility is ready for immediate activation (Example: whiteboards are erased; equipment is re-stored in its proper location, etc,). Admin Staff Support personnel in the TSC/OSC/EOF/JIC will perform Inventory Checklists in EPPRO-02 and give to Lead Controller.

6. EP Improvement Forms should be used to document suggestions and general comments. The corrective action program should be used to document problems with equipment, processes or facilities.

CRITIQUES

1. Participant Critique immediately following the drill (led by facility leads; all participants should be included).
2. Controller/Evaluator Critique following Participant Critique in each facility
3. Lead Evaluator Critique on Wednesday, 0900 hours in the EOF.
4. **Presentation of Critique Findings to Management** will occur at Wednesday **Wednesday, 01/23/02** following MRT. Facility leaders are strongly encouraged to attend.

DRILL OBJECTIVES
Please review attached objectives.

INITIAL CONDITIONS (see attached) (Provide phone list to CR staff)

QUESTIONS AND COMMENTS

Progress Energy

R
Reference
Use

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 2

PART 5

EPRAD-03

DOSE PROJECTIONS

REVISION 13

SUMMARY OF CHANGES

STEP #	REVISION COMMENTS
Cover Page	Revised cover sheet to reflect Progress Energy logo and AP-007 requirements.
Attachment 8.3.5.11	Added nitrogen 16 radiation monitors R-24 to table in attachment.
Attachment 8.3.5.12	Updated drawing to reflect R-24 radiation monitors for the main steam lines
Attachment 8.3.5.16	Revised attachment to show differences between HBRDose and RASCAL 3.0 software for dose assessment activities.

TABLE OF CONTENTS

8.3.1 PURPOSE

This procedure provides instruction for performing dose projections in case of possible offsite emergencies from a release of airborne radioactivity.

8.3.2 RESPONSIBILITIES

1. Operations personnel under the direction of the Site Emergency Coordinator are responsible for performing the Control Room portion of this procedure until the Dose Projection Team is activated.

2. The Radiological Control Manager or the Dose Projection Team Leader is responsible for calculating the TEDE and the thyroid CDE, to be used by the Radiological Control Manager and the Emergency Response Manager in determining and evaluating possible off-site consequences from a release of airborne radioactivity.

NOTE: Due to the complexity and branching nature of this procedure a slightly different numbering convention from other Emergency Procedures (EP) is used.

Additionally, this section contains several Attachments to assist the user that are not specifically referenced in the body of the section.

8.3.3 INSTRUCTIONS

1. USE OF THE DOSE PROJECTION PROGRAM IN THE CONTROL ROOM

   1.1 Accessing The Dose Projection Computer Program.

NOTE: This section represents a systematic approach to access the dose projection computer program. Steps must be followed in order and you must be logged into EDS with an event declared. Any problems in accessing the program must be promptly reported to Information Technology personnel for resolution.

1.1.1 IF the ERFIS terminal to be used is initially aligned to the site LAN, THEN align the terminal to the ERFIS system.

NOTE: Inability to link with the ERFIS host is indicated by the following:

IF initially in ERFIS during the failure

an "ERR11 COMMUNICATIONS TIMED OUT!!!" message on the top line of the man machine interface, and

the EDS icon in the upper right corner will turn red.

IF initially in the site LAN during the failure

Error text on the screen and a login prompt.

1.1.2 IF the ERFIS terminal was in the site LAN at the time of the failure and error text and a login prompt are displayed, THEN proceed to Step 1.1.5 for "local mode" operations.

1.1.3 IF the ERFIS terminal to be used is aligned and linked to ERFIS, THEN dose projection may be accessed by typing the turn on code "hbrdose" in the man-machine interface or alternately, from the main menu select the "EP" Menu, then choose "hbrdose."

1. IF the dose projection program is accessed, THEN proceed to Section 1.2 "Control Room Dose Projection."

2. IF the dose projection program is not accessed, THEN proceed to the next step.

8.3.3 (Continued)

1.1.4 IF the ERFIS terminal to be used is aligned but **not** linked to ERFIS, THEN dose projection **may** still be used, however, radiological and meteorological data must be manually entered.

1. Type the turn on code "hbrdose" in the man-machine interface.

2. Notify Information Technology personnel of problems as soon as practical.

3. IF the dose projection program is accessed, THEN proceed to Section 1.2 "Control Room Dose Projection."

4. IF the dose projection is not accessed, THEN proceed to the next step.

1.1.5 IF the ERFIS terminal to be used can not be aligned to ERFIS, THEN continue in this section to configure the ERFIS terminal for "local mode."

NOTE: As long as the ERFIS terminal has power the following sub-steps should align the terminal to perform dose projection in "local mode." This method will require manual entry of radiological and meteorological data.

1. Reboot the ERFIS terminal by depressing CTRL, ALT, SHIFT, DEL (numeric keypad delete must be used) simultaneously. The computer may take up to 10 seconds to respond to this key sequence.

2. Choose ERFIS/EDS from the System Commander.

3. IF a grey QNX window appears, THEN press the right mouse button to get the menu, choose "exit," and confirm the exit choice. Otherwise skip this step and proceed to the next step.

4. When the cursor is displayed, possibly after various system messages, press "ENTER" if the login prompt is not displayed. A "Login" prompt should appear.

1.1.5 (Continued)

NOTE: The login and password prompts are case sensitive and must be entered in lower case.

5. At the login prompt type "hbrdose" and press "Enter."

6. At the password prompt type "hbrdose" and press "Enter." Hbrdose will automatically start after this step.

7. Do not attempt to print or make electronic notifications in "local mode," as this will further degrade execution of the program.

8. IF "local mode" worked, go to Section 1.2, "Control Room Dose Projection."

   – Contact Information Technology personnel for instructions to return the ERFIS terminal to normal when dose projections are complete.

1.1.6 IF "local mode" did not work on the initial ERFIS terminal, THEN repeat Step 1.1.5 on another ERFIS terminal, and request that Information Technology personnel immediately bring a computer to the Control Room with a current version of the dose projection program installed.

1. Information Technology personnel will provide instructions on accessing the program.

2. Proceed to Section 1.2, "Control Room Dose Projection."

1.2 Control Room Dose Projection:

NOTE: IF at any time the computer locks up while performing the following steps, THEN depress CTRL, ALT, DEL simultaneously, or if that is unsuccessful depress CTRL, ALT, SHIFT, DEL (numeric keypad delete must be used) simultaneously, AND GO TO step 1.1.

1.2.1 With the mouse, left click the Projection menu item.

1.2.2 Left click the Control RM menu item.

NOTE: Within each release pathway, the left mouse button can be used to move the cursor to the desired field. Depressing the left mouse button will also select or deselect any of the monitors.

CAUTION

DO NOT USE radiation monitors that are out-of-service for dose projections. Verify that ERFIS data is correct by comparing it to the control room readouts if the RMS/ERFIS interface multiplexer is in alarm.

When manually entering data in hbrdose do not leave blank spaces between characters, (e.g., use 3,000,000 or 3E6 NOT 3 E6).

1.2.3 CONTAINMENT ⇒ ENVIRONMENT Group

a. IF no monitor in the CONTAINMENT⇒ENVIRONMENT group is in alarm, Make sure that none of the check boxes are selected. You can deselect any monitor by pressing the left mouse button on the desired monitor. Go to step 1.2.4.

1.2.3 (Continued)

NOTE: When performing the following step be aware that R-2 is in units of mR/hr while R-32 A&B are in R/hr.

b. IF R-32A OR R-32B OR R-2 are in alarm, THEN select the alarming monitor that has the highest radiation level AND GO TO step 1.2.3.e.

c. IF R-12 is in alarm and is aligned to the CV, THEN select R-12 AND GO TO Step 1.2.3.e.

d. IF R-12 is in alarm AND is aligned to the plant vent, THEN GO TO Step 1.2.4.

e. IF a bad quality code OR no data is being displayed for the selected monitor, THEN manually enter the reading from the radiation monitor drawer.

NOTE: The default CV release flow of 1.5 CFM is based on the CV design leak rate at design basis CV pressure.

f. IF containment integrity is maintained, THEN go to step 1.2.4.

g. IF containment integrity is not maintained, THEN enter the leakrate that is escaping through an unmonitored pathway in the FLOW field (next to R-32A).

1.2.4 PLANT VENT STACK Group

a. IF no monitors in the PLANT VENT STACK group are in alarm, THEN GO TO Step 1.2.5.

b. IF R-14E is above 50 cpm, THEN select R-14E AND GO TO Step 1.2.4.f.

c. IF R-14D is above 12 cpm, THEN select R-14D AND GO TO Step 1.2.4.f.

d. IF R-14C is in alarm, THEN select R-14C AND GO TO Step 1.2.4.f.

e. IF R-21 is in alarm, THEN select R-21.

f. IF a bad quality code OR no data is being displayed for the selected monitor, THEN manually enter the reading from the radiation monitor drawer.

g. IF R-21 was selected, THEN GO TO Step 1.2.5.

h. IF a good quality code is provided for stack FLOW THEN GO TO Step 1.2.4.i.

i. Select the ventilation units which are operating.

1.2.5 R-12

a. IF R-12 is not in alarm THEN GO TO Step 1.2.6.

b. IF R-12 is aligned to the CV THEN GO TO Step 1.2.6.

c. IF R-14C OR R-14D OR R-14E were selected in Step 1.2.4 THEN GO TO Step 1.2.6.

1.2.5 (Continued)

d. IF R-21 was selected in Step 1.2.4 AND HVE-15 is the only release pathway THEN GO TO Step 1.2.6.

e. Select R-12.

f. IF a bad quality code OR no data is being displayed for R-12, THEN manually enter the reading from the radiation monitor drawer.

NOTE: The groups of HVE units in the PLANT VENT STACK group or Attachment 8.3.5.8, Flow Rates, can be used to determine the following flowrate.

g. Move the cursor to the plant vent stack flow field and enter the flow that is going up the plant vent stack.

1.2.6 LOWER FHB ⇒ ENVIRONMENT Group

a. IF no monitors in the Lower FHB ⇒ ENVIRONMENT group are in alarm, THEN GO TO Step 1.2.7.

b. IF R-20 is in alarm AND has not failed high, THEN select R-20 AND GO TO Step 1.2.6.d.

c. IF R-20 has failed high, THEN select R-30.

d. IF a bad quality code OR no data is being displayed for the selected monitor, THEN manually enter the reading from the radiation monitor drawer.

1.2.7 SECONDARY RELEASE

a. IF NO R-31 monitors are above one mrem/hr, THEN GO TO Step 1.2.8.

b. IF steam/water from the Main Steam Line that has a monitor above one mrem/hr is escaping through a faulted Main Steam System outside containment, THEN GO TO step 1.2.7.d.

c. IF NO PORVs AND NO SRVs are open, THEN GO TO Step 1.2.8.

d. Select PORV/SRV.

e. IF a bad quality code OR no data is being displayed for the selected monitor, THEN manually enter the reading from the radiation monitor drawer.

f. IF the release is due to a Main Steam System fault as described in Step 1.2.7.b., THEN using the Main Steam indications on the RTGB and Attachment 8.3.5.8 to compare flowrates, enter the PORV and SRV combination that would produce the same flow rate as the fault, in the fields below the monitor(s) in alarm, AND GO TO Step 1.2.7.1.i.

g. IF the PORV on the Main Steam Line(s) that has the monitor(s) in alarm are open, THEN enter 1 in the PORV field below the monitor(s)in alarm.

h. IF any SRV(s) on the Main Steam Line(s) that has(have) the monitor(s) in alarm are open, THEN enter the number open in the SRV field below the monitor(s) in alarm.

i. IF a bad quality code OR no data is being displayed in the SG Press field(s) below the monitor(s) in alarm, THEN manually enter the correct pressure as obtained from control room readouts.

1.2.8 STEAM ⇒ CONDENSER

a. IF R-15 is not in alarm, THEN GO TO Step 1.2.9.

b. IF R-14C OR R-14D OR R-14E were not selected in the Plant Vent Stack group OR R-12 was not selected in Step 1.2.5.f, THEN select Steam ⇒ Condenser.

c. IF R-15 is in alarm and not failed high THEN select STEAM⇒CONDENSER AND go to 1.2.8.d.

d. IF a bad quality code OR no data is being displayed for R-15, THEN manually enter the reading from the radiation monitor drawer.

e. IF only one vacuum pump is running, THEN select 310 CFM flow AND GO TO Step 1.2.9.

f. IF two vacuum pumps are running, THEN select 610 CFM flow.

1.2.9 Left click the Done button.

1.2.10 SPECTRUM DETERMINATION

NOTE: The core uncovery time will be the time that a RED status occurs on the CORE COOLING critical safety function status tree until the tree conditions return to yellow status (core covered and core exit thermocouples $< 700^0$ F). This determination can be performed on the TV monitor or on the manual board.

a. IF the incident does not involve the reactor (i.e. spent fuel, waste gas, old spent fuel), THEN GO TO step 1.2.10.f

b. IF the incident involves the reactor AND the core has not been uncovered, THEN GO TO step 1.2.10.e.

c. Select the time that the core has been uncovered:

- < 30 minutes
- 0.5 - 1.8 hours (30 minutes - 1 hour 48 minutes)
- > 1.8 hours (1 hour 48 minutes)

d. GO TO step 1.2.11.

e. IF the incident involves mechanical damage to fuel in the reactor, THEN select '< 30 minutes' AND GO TO step 1.2.11.

f. IF the incident involves a Waste Gas Decay Tank, THEN select WASTE GAS AND GO TO step 1.2.11.

1.2.10 (Continued)

NOTE: Spent fuel that is being shipped or is in preparation for shipment should be classified as OLD SPENT FUEL. Assume that the spent fuel has been out of the reactor core for less than three years if the true time is unknown.

g. IF the incident is a fuel handling accident AND involves spent fuel that has been out of the reactor core for less than three years THEN select SPENT FUEL AND GO TO step 1.2.11.

h. IF the incident is a fuel handling accident AND involves spent fuel that has been out of the reactor core for more than three years THEN select OLD SPENT FUEL.

1.2.11 FILTRATION/CV SPRAYS/PARTITIONING

NOTE: Attachment 8.3.5.5, Accident Mitigation Systems, of this procedure describes if Filtration/CV Sprays/Partitioning are "Effective" or "Not Effective".

a. IF Filtration OR CV Sprays OR Partitioning are effective, THEN select Effective AND GO TO Step 1.2.12.

b. IF Filtration OR CV Sprays OR Partitioning are not effective, THEN select Not Effective.

1.2.12 METEOROLOGY

CAUTION

If direct access to the meteorological tower has failed, the data will appear colored red in the input fields. DO NOT USE THIS DATA.

a. IF meteorological data with a good quality code is being displayed, THEN GO TO Step 1.2.12.m.

b. IF a bad quality code OR no data is being displayed for meteorological data, THEN left click the REFRESH button to make a second attempt to acquire meteorological data from ERFIS.

c. IF the computer makes the connection to the meteorological tower AND the meteorological data is properly updated (in accordance with Caution Statement above), THEN GO TO Step 1.2.12.m.

d. IF meteorological data is not available from the control room computer, THEN manually update the meteorological data.

e. Call the PGN offsite meteorological contact (See the ERO Phone Book for number).

f. IF meteorological data is available from the PGN offsite meteorological contact, THEN manually update the meteorological data AND GO TO Step 1.2.12.k.

NOTE: If the Florence Airport or the National Weather Service office is called, the only information that can be obtained is the wind direction, wind speed, and ambient temperature. Stability factor must be obtained from Step 1.2.12.k of this procedure. If wind speed and direction are only supplied for one point enter these values in both the elevated and ground fields. Do not enter wind gust as the wind speed, and if no Delta T is supplied do not enter one.

g. Call the Florence Airport: (See the ERO Phone Book for numbers)

1.2.12 (Continued)

h. IF meteorological data is available from the Florence Airport, THEN manually update the meteorological data AND GO TO Step 1.2.13.

i. Call the National Weather Service office in Columbia, South Carolina: (See the ERO Phone Book for numbers)

j. IF meteorological data is available from the National Weather Service, THEN manually update the meteorological data.

k. IF there is no stability class data available, THEN make an estimate of the current Atmospheric Stability Class by visual observation, using the following table:

	Rain, Day or Night	Sunny Day	Cloudy Day	Cloudy Night	Clear Night
light wind or calm (< 11.5 mph)	D	B	C	E	F
moderately strong wind(≥ 11.5 mph)	D	C	D	D	D

l. Enter the stability class in the appropriate field.

m. Left click the Shutdown time field.

1.2.13 REACTOR SHUTDOWN TIME

a. IF the reactor is not shutdown, THEN GO TO Step 1.2.14.

b. IF the reactor is shutdown AND the shutdown time is not displayed OR is not correct, THEN manually enter the date and time of shutdown in the space provided.

1.2.14 RELEASE DURATION

NOTE: The estimated release duration should be from the start of the release until the projected time that the release should stop. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, CV Sump, or Steam Generator is below 200° F.

a. IF the release duration is known, THEN manually enter the release duration in the field provided AND go to Step 1.2.15.

b. IF the release duration is unknown AND an estimate is available, THEN enter the estimated time in the field provided AND go to Step 1.2.15.

c. IF the release duration is unknown AND no estimate is available, THEN enter 1 in the field provided AND go to Step 1.2.15.

1.2.15 Left click the Done button.

1.2.16 The dose projection will be given on the screen.

1.2.17 Using the information supplied notify the government officials as per the requirements of EPNOT-01.

2. USE OF THE DOSE PROJECTION PROGRAM BY THE DOSE PROJECTION TEAM

2.1 Access the software using Section 1.1 of this procedure as a guideline, and return to this section instead of the Control Room Dose Projection section.

2.2 The main menu screen will appear. The items in this menu can be accessed by clicking the left button on any of these items.

2.3 Six menu topics are available for use. They are listed here along with the section in this procedure which explains their use.

Projection	2.4
Contingency	2.5
Int Phase	2.6
Graphics	2.7
Utilities	2.8
Exit	2.9

NOTE: The Dose Projection Program should be used to calculate the "Total Dose" from the start of the release until the projected end. To do so conservatively, the Dose Projection Team may decide to use the estimated peak release rate throughout the release period. If no information is available, the current release rate should be considered constant throughout the release period.

2.4 PROJECTION

This menu item should be used to perform early phase dose projections based on plant radiation monitors, plant samples, or environmental samples.

2.4.1 Control Room

This function should be used by control room personnel. Its use is described in Step 1.2 of this procedure.

2.4.2 RMS

This function should be used by the dose projection team to perform dose projections when adequate data is available from the plant effluent monitors. The following steps are for guidance and are not required to be performed in entirety or in the order in which they are given.

2.4.2.1 The first screen that will appear when this menu option is selected is the ROBINSON EFFLUENT MONITORS screen. The following items should be considered when using this screen:

CAUTION

DO NOT perform an official dose projection using data obtained from a radiation monitor that is out-of-service. The control room may be contacted to determine any monitors that are out-of-service that may have good quality codes on ERFIS. This could occur when the RMS/ERFIS interface multiplexer fails.

When manually entering data in hbrdose do not leave blank spaces between characters, (e.g., use 3,000,000 or 3E6 NOT 3 E6).

NOTE: Attachment 8.3.5.12, RMS Monitored Systems can be used to determine the relationship between radiation monitors and effluent pathways.

- Data that is on this screen will have quality codes in Attachment 8.3.5.3, Quality Codes of this procedure.

2.4.2.1 (Continued)

- Dose projections for more than one release pathway can be performed using this program. The monitors are grouped on this screen according to the release pathway that they monitor. Therefore, only one monitor from each group can be selected each time the dose projection program is executed.

- The Containment to Environment release path is a valid release path in most situations even when no containment leakage has been identified. The 1.5 cfm flow is the design basis release rate when the CV is pressurized to design basis pressure. If containment leakage is into the Auxiliary Building and the release is monitored by a stack monitor a dose projection using the containment monitors is not necessary.

NOTE: If a projection is made using R-12 aligned to the plant vent it will be based on a ground level release pathway instead of a mixed mode release.

- R-12 is usually lined up to the containment atmosphere. If a dose projection is performed using R-12, ensure that it aligned the way that it is being used.

- R-12 can be used to perform a dose projection when it is aligned to the plant vent. In order to accomplish this the R-12 plant vent flowrate must be manually entered into the containment monitors flowrate field. If this is performed, then it can not be accomplished at the same time that a dose projection is being performed based on containment leakage. For this reason, if a projection is needed based on both release paths, they must be performed separately and manually added together.

2.4.2.1 (Continued)

- The flow rate for the R-14 monitors will be automatically updated by ERFIS to reflect the plant vent stack when ERFIS is available.

- R-21 has a default flow rate which is equivalent to the flow of HVE-15. This default value should normally be used, because this is the effluent volume that this detector is monitoring.

- R-20 and R-30 have a default flow rate which is equivalent to the flow of HVE-14.

- R-31A, 31B, and 31C should not normally be used if they are below 1 mrem/hr. However, if they are, they must be background corrected and manually entered. Obtain the latest valid normal reading from the weekly background/alarm setpoint check or other source (Attachment 8.3.5.11, Typical RMS Data, may be used) and subtract the normal reading from the control room readout and enter this value.

- If a release is due to a faulted steam line, a dose projection can be performed by selecting the number of SRV's and PORV that would approximate the release (use Attachment 8.3.5.8, Flow Rates). The UNKNOWN MIX under the CONTINGENCY menu can be used to perform a dose projection under this condition using Attachment 8.3.5.7, Source Term Determination, Part E.

2.4.2.1 (Continued)

NOTE: If a dose projection is performed using R-15 and the release is due to a break in the line between the condenser vacuum pumps and the plant vent stack, the projection will be based on a mixed mode release, instead of a ground level release.

– The program will allow you to perform dose projections using the R-15 monitor and the plant vent monitors at the same time. However, this should only be done under the following circumstances:

- R-15 is above background and the line from the condenser vacuum pumps to the plant vent is allowing leakage, OR

- R-15 is above background and NEITHER R-14C, R-14D, R-14E, NOR R-12 when it is aligned to the plant vent, are being used for a dose projection.

2.4.2.2 Once selections have been made on this screen select the DONE field.

2.4.2.3 The SPECTRUM DETERMINATION screen is the next screen that will appear. Several characteristics of the incident must be entered on this screen in order to identify the source term.

NOTE: Only one of the following conditions can exist for each execution of the Dose Projection Program. If more than one of the following conditions exist, execute the projection more than once using the appropriate effluent monitors to accurately quantify the effluent.

- If the incident involves the reactor, the time that the reactor core has been uncovered must be selected using the guidelines in Attachment 8.3.5.4, Core Uncovery Time Determination of this procedure.
- If the incident involves Spent Fuel, regardless of the location, you must identify if the fuel is Spent Fuel or Old Spent Fuel. Old Spent Fuel is fuel that has <u>not</u> been in the reactor while critical for three years or more.
- If the incident involves a Waste Gas Decay Tank select the Waste Gas option.

NOTE: The estimated release duration should be from the start of the release until the projected time that the release should stop. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, CV Sump, or Steam Generator is below 200° F.

- The RELEASE DURATION should be determined and entered in the appropriate field. If an estimate of the time is not known one hour can be used here until better information is available.

2.4.2.3 (Continued)

NOTE: A Plant Operations Advisor, SRO on the Accident Assessment Team, or the Shift Technical Advisor should be consulted to determine whether these mitigation systems are operable.

- The effectiveness of FILTRATION/CV SPRAYS/PARTITIONING should be determined. Use the guidelines in Attachment 8.3.5.5, Accident Mitigation Systems, of this procedure to make this determination.

- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using Attachment 8.3.5.6, Obtaining and Updating Meteorological Data, of this procedure for guidance.

- If the plant has SHUTDOWN enter the shutdown date and time in the appropriate fields. Otherwise, these fields can be left as they appear.

- The DONE field should be selected when all of the information on this screen has been entered.

2.4.2.4 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.4.3 PLANT SAMPLE

This function is for use by the dose projection team to perform dose projections based on plant samples of the effluent stream. It should be used as needed by the dose projection team.

2.4.3.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

- Enter the activity of each nuclide that is listed on the screen that is available from the plant sample analysis.

- Identify the release height of the effluent. Select mixed if the release is through the plant vent regardless of the wind speed. Select ground if the release is by any other pathway, or if the pathway is unknown.

- The time from sample to release is provided to correct the sample activity for any radioactive decay that has occurred in the sample effluent between the time the sample was collected and the time of the release. DO NOT enter a value in this field unless you wish to decay correct the effluent stream.

- Enter the flowrate in cfm of the effluent stream. Care should be taken to understand where the sample was obtained, and ensure that the FLOW field data corresponds with the flow of the sampled air with no further dilution. A flowrate can be manually entered using the flowrates in Attachment 8.3.5.8, Flow Rates, as a reference, or a flow can be selected by selecting the FLOWS field.

2.4.3.1 (Continued)

NOTE: The estimated release duration should be from the start of the release until the projected time that the release should stop. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, CV Sump, or Steam Generator is below 200° F.

- The release duration should be determined and entered in the appropriate field. If an estimate of the time is not known, one hour can be used until better information is available.

- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using Attachment 8.3.5.6, Obtaining and Updating Meteorological Data of this procedure for guidance.

- If the plant has shutdown, enter the shutdown date and time in the appropriate fields.

- The DONE field should be selected when all of the information on this screen has been entered.

2.4.3.2 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.4.4 ENVIRONMENTAL SAMPLE

This function is for use by the dose projection team to perform dose projections based on environmental samples. It should be used as needed by the dose projection team.

NOTE: Protective action recommendations are required to be made within 15 minutes of obtaining environmental sample results. (AR #48774)

2.4.4.1 The screen that will appear when this menu option is selected is titled as the ENVIRONMENTAL MONITORING TEAM. It should be completed with the help of the following guidelines.

– Enter the closed window dose rate (in mrem/hr) that is obtained at a height of approximately one meter above the ground. The value should be obtained from the Environmental Monitoring Team Leader and should reflect the most recent data that is available from near the centerline of the plume.

– For the air sample dose rate select the CART field, and enter data in the appropriate fields using the following guidance:

- Enter the sample volume in cubic feet.

- Select whether count rate or dose rate will be entered.

- Enter the count rate or dose rate on contact with the iodine cartridge. This data should be obtained from the Environmental Monitoring Team Leader and should reflect the most recent data that is available from the centerline of the plume.

- Select the DONE field and the program will calculate the Thyroid Committed Dose Rate. (This calculation is based on Attachments in EPRAD-01, Environmental Monitoring.)

- Select the CANCEL field to exit this window or click the mouse outside of the window.

2.4.4.1 (Continued)

- Enter the downwind distance from the plant stack to the sample collection location.
- Enter the direction from the plant that the sample was collected in degrees.
- The release duration should be determined and entered in the appropriate field. If the time is not known one hour should be used here until better information is available.
- Identify the release height of the effluent. Select mixed if the release is through the plant vent regardless of the wind speed. Select ground if the release is by any other pathway, or if the pathway is unknown.
- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using step Attachment 8.3.5.6, Obtaining and Updating Meteorological Data, of this procedure for guidance.
- If the plant has shutdown enter the shutdown date and time in the appropriate fields.
- The DONE field should be selected when all of the information on this screen has been entered.

2.4.4.2 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.5 CONTINGENCY

Contingency calculations are typically "what if" types of calculations that allow the Dose Projection Team to make predictions of off-site dose based on a projected event. However, they can be used to make actual dose projections.

2.5.1 KNOWN MIX

This function allows the user to input the isotopic analysis of the release in order to perform a dose projection.

2.5.1.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

- Enter the activity of each nuclide that is listed on the screen which could be in a postulated release.
- Identify the release height of the effluent. Select mixed if the release is through the plant vent regardless of the wind speed. Select ground if the release is by any other pathway, or if the pathway is unknown.
- Enter the time from when the activities were determined until the release could begin. This is not required, it should only be entered when it is expected that the activity has decayed since the sample was pulled.
- Enter the number of Curies that could be released. Attachment 8.3.5.7, Source Term Determination, of this procedure can be used to help determine this value.

2.5.1.1 (Continued)

- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using Attachment 8.3.5.6, Obtaining and Updating Meteorological Data, of this procedure for guidance.

- If the plant has shutdown enter the shutdown date and time in the appropriate fields.

- The DONE field should be selected when all of the information on this screen has been entered.

2.5.1.2 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.5.2 UNKNOWN MIX

This function allows the user to project what the offsite dose to the public would be due to a release if the total activity of the release is known but the isotopic abundances are not known.

2.5.2.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

NOTE: Only one of the following conditions can exist for each execution of the Dose Projection Program. If more than one of the following conditions exist, execute the projection more than once using the appropriate effluent monitors to accurately quantify the effluent.

- If the incident involves the reactor core the time that the reactor core has been uncovered or could be uncovered must be selected. Use Attachment 8.3.5.4, Core Uncovery Time Determination, to help make this determination.

2.5.2.1 (Continued)

- If the incident involves Spent Fuel, regardless of the location, you must identify if the fuel is Spent Fuel or Old Spent Fuel. Old Spent Fuel is fuel that has not been in the reactor while critical for three years or more.

- If the incident involves a Waste Gas Decay Tank select the Waste Gas option.

- Enter the number of Curies that could be released. Attachment 8.3.5.7, Source Term Determination, of this procedure can be used to help determine this value.

- Identify the release height of the effluent. Select mixed if the potential release is through the plant vent regardless of the wind speed. Select ground if the release is by any other pathway, or the pathway is unknown.

- The effectiveness of Filtration/CV Sprays/Partitioning should be determined. The guidelines in Attachment 8.3.5.5, Accident Mitigation Systems, of this procedure should be used to make this determination.

- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using Attachment 8.3.5.6, Obtaining and Updating Meteorological Data, of this procedure for guidance.

- If the plant has shut down enter the shutdown date and time in the appropriate fields.

- The DONE field should be selected when all of the information on this screen has been entered.

2.5.2.2 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.5.3 DEFAULTS

CAUTION

Calculated dose using defaults are EXTREMELY conservative and may assume all of the core activity is released, depending on the spectrum determination.

This function allows the user to hypothesize what the offsite dose to the public would be due to a postulated release if plant conditions are unknown. A default should only be used when neither the total activity nor the isotopic analysis of the potential release are known.

2.5.3.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

NOTE: Only one of the following conditions can exist for each execution of the Dose Projection Program. If more than one of the following conditions exist, execute the projection more than once using the appropriate effluent monitors to accurately quantify the effluent.

- If the incident involves the reactor core the time that the reactor core has been uncovered or could be uncovered must be selected. Use Attachment 8.3.5.4, Core Uncovery Time Determination, to make this determination.

- If the incident involves Spent Fuel, whether in the containment or in the Fuel Handling Building, you must identify if the fuel is Spent Fuel or Old Spent Fuel. Old Spent Fuel is fuel that has not been in the reactor while critical for three years or more.

2.5.3.1 (Continued)

- If the incident involves a Waste Gas Decay Tank select the Waste Gas option.

- Identify the release height of the effluent. Select mixed if the potential release is through the plant vent regardless of the wind speed. Select ground if the release is by any other pathway, or the pathway is unknown.

- The effectiveness of Filtration/CV Sprays/Partitioning should be determined. The guidelines Attachment 8.3.5.5, Accident Mitigation Systems, of this procedure should be used for making this determination.

- If the quality codes for the meteorology data are good they may be used. If the quality codes are bad or there is other reason to question them, complete this section using Attachment 8.3.5.6, Obtaining and Updating Meteorological Data, of this procedure for guidance.

- If the plant has shutdown enter the shutdown date and time in the appropriate fields.

- The DONE field should be selected when all of the information on this screen has been entered.

2.5.3.2 The Projection Screen is the final screen to appear. It is explained in Step 3 of this procedure.

2.6 INTERMEDIATE PHASE

Intermediate phase calculations are used during the intermediate phase of an emergency to project the one year, two year, and fifty year committed dose to the public due to exposure from contamination deposited on the ground. The calculations are based on environmental data.

2.6.1 DOSE RATE

This function is used to calculate the projected doses using dose rate data from environmental monitoring teams.

2.6.1.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

- It should be determined if weathering (radioactive decay is also included in this factor) will be considered when performing this function. To do this select the UTILITIES function from the main menu, and follow the guidelines in Step 2.8.1 of this procedure.

- Enter the closed window dose rate in mrem/hr taken at approximately one meter from the ground in the 1 meter dose rate field.

- Enter the straight line distance in miles or fractions of miles from the plant vent that the sample was taken.

- Enter the bearing in degrees from the plant for the sample location.

2.6.1.1 (Continued)

NOTE: If no data has been entered under the "Sample" then the "Average Spectrum" choice will not appear, and only the Default Spectrum can be used.

- Select if the Default Spectrum or the Average Spectrum should be used to perform the projection. The Average Spectrum should be selected here when adequate data has been entered in the "Sample" screen (Step 2.6.2).

- Select the DONE field when complete and the dose will be given.

2.6.2 Sample

This function is used to calculate the projected dose using isotopic analysis of samples collected by environmental monitoring teams.

2.6.2.1 The screen that will appear when this menu option is selected should be completed with the help of the following guidelines.

- It should be determined if weathering (radioactive decay is also included in this factor) will be considered when performing this function . To do this select the UTILITIES function from the main menu, and follow the guidelines in Step 2.8.1 of this procedure.

- Enter the activity of each nuclide that is present in the sample that is listed on this screen. These activities should be entered in units of pCi/m^2. The nuclides that are listed on this screen are the only ones in RNP's anticipated source term that have a long enough half-life to contribute significant dose.

2.6.2.1 (Continued)

- Enter the sample identification number. This will normally be our radiochemistry form number.
- Determine if the sample should be added to the sample data base from which the average deposition is calculated. Choosing this option will also include the sample in the average spectrum function of the DOSE RATE option.
- Enter the straight line distance in miles or fractions of miles from the plant vent that the sample was taken.
- Enter the direction in degrees from the plant for the sample location.
- Select the DONE field when complete and the dose will be given.

2.7 GRAPHICS

This menu item provides a graphic display of the 10 mile and 50 mile Emergency Planning Zones. It should be used as an aid by the Dose Projection Team to help with Protection Action Recommendations, and determining the adequacy of the environmental monitoring efforts.

NOTE: The latest graphics of the 10 MILE ISOPHLETHS and the 10 MILE PARs are automatically saved to a disk file. They can be printed using the Microsoft Paintbrush program.

2.7.1 10 MILE ISOPLETHS

This function provides a display of the isopleths within the 10 mile Emergency Planning Zone where the TEDE and Thyroid CDE limits are exceeded. If isopleths do not appear the EPA PAGs are not exceeded by the latest dose projection.

2.7.2 10 MILE PARS

This function displays the evacuation Protective Action Recommendations for the 10 Mile Emergency Planning Zone. This display consist of a five mile radius with a two mile keyhole superimposed on the map. The two mile keyhole applies to only the two mile sector (A0). Any of the five mile sectors (A1, B1, C1, D1, and E1) that are intersected by the five mile radius keyhole should be evacuated. If the dose at the centerline of the plume exceeds the EPA PAGs at any distance five miles or beyond, then the radius of the keyhole is extended to ten miles. Any of the ten mile sectors (A2, B2, C2, D2, and E2) which are intersected by the ten mile keyhole should be evacuated.

2.7.3 10 MILE EMT POINTS

This function provides a method to enter and display Environmental Monitoring Team Data in the 10 mile EPZ.

- Click the mouse on the map location were the sample was taken.
- Enter the closed window dose rate taken at approximately one meter above the ground. Use units of mrem/hr and depress the enter key when complete.
- The computer will update the sample point with a color coded circle depending on the dose rate recorded at the location. These color codes are given in the upper right hand corner of the screen.

2.7.4 50 MILE INT PHASE

This function provides a method to enter Environmental Monitoring Team Data in the 50 mile EPZ, and calculate and display the 1, 2, and 50 year committed doses along with the skin dose.

- Click the mouse on the map location were the sample was taken.
- Enter the closed window dose rate taken at approximately one meter above the ground. Use units of mrem/hr and depress the enter key when complete.
- The computer will update the sample point with a color code that represents if the program is above the EPA limits, above normal background, at background level. It will also calculate the 1, 2, and 50 year committed doses along with the skin dose.

2.8 UTILITIES

This menu item is provided to assist the Dose Projection Team. These functions can be used at any time they are needed while using the program.

2.8.1 WEATHERING

This function is used when performing an Intermediate Phase Dose Projection to account for reductions in the source term due to weathering and radioactive decay.

2.8.2 PRINTING SETUP

This function can be used to configure printing from this application. The user can configure custom printers and enable or disable the automatic printing of dose projection screens.

2.8.3 DISTANCES

This function allows the user to adjust the distances from the plant that dose projections are calculated. This is done by identifying the maximum distance from the plant and the increment between each distance that is desired. This function is especially useful in determining distances close in to the site or beyond 10 miles.

2.8.4 NOTIFICATION

This function will automatically print out a State Notification Form in the proper format with the dose projection information completed when it is selected.

2.8.5 MANUAL SCREEN PRINT

Use this menu item to print the currently displayed dialog or screen. The printout will be directed to the default printer for the workstation unless a custom printer has been selected.

2.9 EXIT

This menu item will exit the dose projection program when it is selected.

3. INTERPRETATION OF THE DOSE PROJECTION SUMMARY TABLE

This summary table appears on the screen after the dose projection calculation has been completed.

3.1 The first column at the top of this table is the distance from the plant. These distances default to Site Boundary, 2 Miles, 5 Miles, and 10 Miles. The distance along the centerline of the plume is identified in the Max row.

3.2 The second column at the top of this table is the TEDE in mrem. This will give the value that is entered on the Notification Form in the appropriate location.

3.3 The third column at the top of this table is the Thyroid CDE in mrem. This will give the value that is entered on the Notification Form in the appropriate location.

3.4 The next three columns give the Effective Dose Equivalent due to Immersion in the plume, the Committed Effective Dose Equivalent due to inhalation, and the Effective Dose Equivalent due to ground deposition. These columns are provided for information only.

3.5 The final column at the top of the table gives the X/Q value in s/m^3. This value should be provided to the State and Federal Emergency Response Officials when requested. For stability classes E, F, and G in MIXED MODE RELEASES, the X/Q is extremely small at the site boundary when compared with the other X/Q values.

3.6 The Dose Projection Summary Table also contains the Dose Projection Meteorology Data.

3.7 The reactor shutdown time is also found on this table.

3.8 The Projection Time which the Notification Form refers to is listed on the table as the Calculation Time.

NOTE: The following two steps are very important for proper correlation between the dose projections performed by HBR's Dose Projection Team and the projections performed by State personnel. The Xe-133 Equivalent Release and the I-131 Equivalent Release values are used by South Carolina Department of Health and Environmental Control for input into their dose assessment program.

3.9 The Xe-133 Equivalent Release is provided on this table and it is the value that should be entered as the Noble Gas Activity on the Notification Form. If any results are questionable, then Attachment 8.3.5.17 should be used to calculate this value.

3.10 The I-131 Equivalent Release is provided on this table and it is the value that should be entered as the Iodine Activity on the Notification Form. If any results are questionable, then Attachment 8.3.5.17 should be used to calculate this value.

3.11 The Dosimeter Correction Factor that is provided on this table should only be used when the Radiological Control Manager has directed that a Dosimeter Correction Factor is necessary, and there is not adequate data to calculate one using environmental data.

NOTE: The Emergency Action Level provided by the dose projection program is for INFORMATION ONLY. All Emergency Classifications shall be made by using the EAL procedures.

3.12 Emergency Action Levels

If an Emergency Action Level due to a dose projection is exceeded, the output screen will indicate the appropriate classification. Evaluate the EAL Flow Charts and compare the dose calculation against the EAL's to determine the Emergency Classification. Notify the RCM of all Emergency Action Levels that the program recommends.

3.13 HBRDOSE/RASCAL

Attachment 8.3.6.16, HBRDOSE/RASCAL Comparison Matrix can be used to discuss differences in plant dose projections and those performed using the NRC's RASCAL program.

8.3.4 **RECORDS**

N/A

8.3.5 **ATTACHMENTS**

8.3.5.1 Definitions and Abbreviations

8.3.5.2 General Information

8.3.5.3 Quality Codes

8.3.5.4 Core Uncovery Time Determination

8.3.5.5 Accident Mitigation Systems

8.3.5.6 Obtaining and Updating Meteorological Data

8.3.5.7 Source Term Determination

8.3.5.8 Flow Rates

8.3.5.9 Detector Sensitivities

8.3.5.10 Measuring Radiation Level on Main Steam Lines

8.3.5.11 Typical RMS Values

8.3.5.12 RMS Monitored Systems

8.3.5.13 Weather Service Data

8.3.5.14 Onsite Meteorological Data

8.3.5.15 Meteorological Forecast Form

8.3.6.16 HBRDOSE/RASCAL Comparison Matrix

DEFINITIONS/ABBREVIATIONS

Definitions:

Atmosphere Dispersion Factor (X/Q) - the fraction of activity released that will reach the point of interest (sec/m^3).

Committed Dose Equivalent- The dose equivalent to organs or tissue of reference that will be received from an intake of radioactive material by an individual during the 50 year period following the intake.

Committed Effective Dose Equivalent - The sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues.

Core Uncovery Time - The time that inadequate core cooing occurs until the time that adequate core cooling is restored. (See Attachment 8.3.5.4).

Early Phase - The period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required, and must be based primarily on predictions of radiological conditions in the environment. This phase may last from hours to days. For the purpose of dose projection, it is assumed to last for four days.

Effective Dose Equivalent - The sum of the products of the dose equivalent to each organ and a weighting factor, where the weighting factor is the ratio of the risk of mortality from delayed health effects arising from irradiation of a particular organ or tissue to the total risk of mortality from delayed health effects when the whole body is irradiated uniformly to the same dose. This unit is considered equivalent to be the Deep Dose Equivalent for the purposes of dose projections because the external exposures are considered to be uniform across the whole body.

DEFINITIONS/ABBREVIATIONS

Intermediate Phase - The period beginning after the incident source and releases have been brought under control and reliable environmental measurements are available for use as a basis for decisions on additional protective actions and extending until these protective actions are terminated. This phase may overlap the early and late phases and may last from weeks to many months. For the purpose of dose projection, it is assumed to last for one year.

Late Phase - The period beginning when recovery action designed to reduce radiation levels in the environment to permanently acceptable levels are commenced, and ending when all recovery actions have been completed. This period may extend from months to years (also referred to as the recovery phase).

Release Duration - The period of time from the beginning of the release until the end of the release or the projected end of the release. This can be determined by estimating the completion of a damage control mission, performance of a repair to stop the release, or the estimated time until the RCS, CV Sump, or Steam Generator temperature is below 200° F.

Release Rate (Q) - The term in the dose projection which describes the amount of activity that is being released. This is recorded in Curies per second. The total curies released may be calculated from the release rate (Q) and the release duration in seconds.

Total Effective Dose Equivalent - The sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent(for internal exposures).

Weathering/Weathering Factor - The fraction of radioactivity remaining after being affected by average weather conditions for a specified period of time.

Abbreviations:

1. ALARA - As Low As is Reasonably Achievable
2. BSEP - Brunswick Steam Electric Plant
3. CDE - Committed Dose Equivalent
4. CFM - Cubic Feet per Minute
5. CPM - Counts Per Minute
6. CV - Containment Vessel
7. EAL - Emergency Action Level
8. EMT - Environmental Monitoring Team
9. EOF - Emergency Operations Facility
10. ERFIS - Emergency Response Facility Information System
11. ERO - Emergency Response Organization
12. GPM - Gallons Per Minute
13. HNP - Harris Nuclear Project
14. LAN - Local Area Network
15. LOCA - Loss Of Coolant Accident

DEFINITIONS/ABBREVIATIONS

16. PORV - Power Operated Relief Valve
17. RCS - Reactor Coolant System
18. RMS - Radiation Monitoring System
19. SDS - Satellite Display System
20. SRO - Senior Reactor Operator
21. SRV - Safety Relief Valve
22. STA - Shift Technical Advisor
23. TEDE - Total Effective Dose Equivalent

GENERAL INFORMATION

Backup Capability:

If ERFIS or a computer with the dose projection program are not available, contact computer support personnel and request that they provide a computer with the current revision of the dose projection software installed on it.

R-14 C, D, and E operate as follows:
R-14C is the Normal range Noble Gas monitor.
R-14D is the Intermediate range Noble Gas monitor.
R-14E is the High range Noble Gas monitor.
R-14D and R-14E normally read between 10 and 11 CPM.

R-14C when increasing will reach its predetermined alarm setpoint. Further increase will cause R-14C to reach its predetermined swap-over setpoint. When the swap-over setpoint is reached, R-14C will fail to 1 Meg (1M) which also will cause R-14D and R-14E to activate and start providing intermediate and high range noble gas readings. If R-14C is reading 1 Meg, this SHOULD NOT be used as a valid reading and RMS data SHOULD BE obtained from R-14D and R-14E.

Special attention should be paid to the quality code of the data on the program. Quality code color schemes are given in Attachment 8.3.5.3.

In order to select an item when performing the dose projection press the space bar. Pressing the space bar will also deselect the item if it had already been selected.

The help menu may be accessed at any time while using the dose projection program. This can be accomplished by pressing the F1function key. The function can be exited by clicking the mouse on the EXIT field or by pressing the F1 key.

Messages are displayed at the bottom of each screen to describe the function that the cursor is on.

Attachments 8.3.5.14, Onsite Meteorological Data, and 8.3.5.15, Meteorological Forecast Form, can be used to record weather conditions and forecast.

QUALITY CODES

Color of Data	Meaning	Action
Red Stars	Computer Entered Bad Data	**Do Not** Use This Data
Green	Computer Entered Good Data Normal Level	This Data May Be Used
Yellow	Computer Entered Good Data Alert Level	This Data May Be Used
Red	Computer Entered Good Data Alarm Level	This Data May Be Used
White	Manually Entered Data	This Data May Be Used

CORE UNCOVERY TIME DETERMINATION

NOTE: The time determination below is based upon the core level and temperature that the core cooling is insufficient to prevent the cladding from overheating and failing. This basis is conservative for all fuel damage scenarios which result from core uncovery. This time can be determined by consulting a SRO or RO with access to plant data.

- Core uncovery time is defined for dose projection purposes to be the point in time that inadequate core cooling occurs until the time that adequate core cooling is restored. For the purposes of dose projection core uncovery time will be the time that a RED status occurs on the CORE COOLING critical safety function status tree until the tree conditions return to YELLOW status (core covered and core exit thermocouples < 700° F).

- There are other possible accidents that may result in fuel damage. These events could be initiated by core flow blockage from debris or by localized melting from a rod ejection accident, pump failures, etc. as analyzed by the UFSAR. In this case, judgment may be applied using the bases information for CORE UNCOVERY TIME DETERMINATION above to most closely describe the fuel damage situation. In general choice of "uncovery < 30 min", corresponding to a release of 100% of the gap activity will conservatively account for most mechanical and miscellaneous fuel damage situations.

ACCIDENT MITIGATION SYSTEMS

The capability to take credit for accident release mitigation systems is built into the dose projection program. Credit is given one of three ways, charcoal filtration, containment sprays, and water partitioning in the steam generator.

> **NOTE:** It is important to note that if the release is mitigated by **ANY** of the following: Charcoal Filtration, CV Sprays, or Partitioning, then assume mitigating effects are **EFFECTIVE** unless information is known to be otherwise. Only if the release pathway is direct to the environment without mitigation, should **NOT EFFECTIVE** be selected.

- Filtration

  Various fans can be aligned to cleanup effluent from leaking systems. When the release is passing through any one of the following fans, filtration can be considered effective. The general area(s) where the fan draws a suction is listed in parenthesis.

  - HVE-1A or HVE-1B (Containment Purge)
  - HVE-3 or HVE-4 (Containment Air, In pre-purge mode)
  - HVE-5A or HVE-5B (Auxiliary Building Exhaust)
  - HVE-15A (Spent Fuel Pit during refueling)

- The CV Spray System

  The CV Spray System is designed to remove radioiodine from containment in the event a radioactive release (typically a LOCA) occurs inside containment. If such a release occurs and the CV Spray System (with NaOH added) is operating, then the CV Sprays are considered effective.

- Water Partitioning

  Occurs during a release through the steam generators (e.g., a tube leak or tube rupture) and level in the affected steam generator is above the top of the tubes. Partitioning is effective for removing iodines and some particulates when the steam generator level is greater than 10% on the Narrow Range Steam Generator Level Indicator.

OBTAINING AND UPDATING METEOROLOGICAL DATA

In the manual data entry mode, meteorological data may not be available from ERFIS. Determine wind direction, wind speed, and atmospheric stability class using one of six methods listed in preferred order of use.

> **NOTE:** Meteorological data will normally display a green value and an "OK" quality code. If the values are displayed in white, or the quality code is "BAD", DO NOT USE THIS DATA.

1. If operable, use the data from control room readouts to obtain the atmospheric stability class, wind speed, and wind direction.

OR

2. Call the PGN offsite meteorological contact (See ERO Phone Book for number).

> **NOTE:** If The Florence Airport or the National Weather Service office is called, the only information that can be obtained is the wind direction, wind speed, and ambient temperature. Stability factor must be obtained from Step 5 of this Attachment.
>
> If wind speed and direction are only supplied for one point enter these values in both the elevated and ground fields. Do not enter wind gust as the wind speed, and if no Delta T is supplied do not enter one.

3. Call the Florence Airport for Weather Information (See ERO Phone Book for number).

OR

4. Call the National Weather Service office in Columbia, South Carolina, for daily weather information or in Wilmington, North Carolina, for severe weather information. Use Attachment 8.3.5.13 to document this: (See ERO Phone Book for number)

OR

5. If there is no stability class data readily available, a general estimate of the current Atmospheric Stability Class can be made by visual observation, using the following table:

	Rain, Day or Night	Sunny Day	Cloudy Day	Cloudy Night	Clear Night
light wind or calm (< 11.5 mph)	D	B	C	E	F
moderately strong wind(≥ 11.5 mph)	D	C	D	D	D

OR

6. A manual method may be used to acquire data from the meteorological tower. The following method may be used to manually obtain this data:

   A. Obtain the Meteorological Tower Building key from E&RC or Plant Security.

   B. Locate the Met Tower recorder inside the building.

   C. Locate the Upper Display key on the recorder.

   D. Depress the Upper Display key one or more times until the Upper Display is placed in manual control. "MAN" will be displayed in the Lower Display of the recorder.

   E. Locate the Channel Up (CH Up) and Channel Down (CH Down) keys on the recorder.

   F. Using the Channel Up (CH Up) and Channel Down (CH Down) keys, scroll through the recorder channels to obtain the necessary information required on the "Manual Meteorological Collection Data Sheet" included in this attachment.

   G. Using the Differential Temperature values obtained from the recorder, determine the Stability Class as per the table included in this attachment.

EXAMPLE OF RECORDER CHANNEL SELECTIONS

CH 01 LT1 - Lower Temperature #1 (ambient temperature)
CH 02 DT1 - Differential Temperature #1
CH 03 DT2 - Differential Temperature #2
CH 04 LWS - Lower Wind Speed
CH 05 LWD - Lower Wind Direction
CH 06 UWS - Upper Wind Speed
CH 07 UWD - Upper Wind Direction
CH 08 DPT - Dew Point

MANUAL METEOROLOGICAL COLLECTION DATA SHEET

WIND SPEED

UPPER WIND SPEED _____ MPH

LOWER WIND SPEED _____ MPH

WIND DIRECTION

UPPER WIND DIRECTION _____ DEGREES

LOWER WIND DIRECTION _____ DEGREES

AMBIENT TEMPERATURE

TEMPERATURE _____ DEGREES F

DIFFERENTIAL TEMPERATURE

DT1 = _____ C/100M

DT2 = _____ C/100M

STABILITY CLASS

$\frac{DT1 + DT2}{2}$ = _____C/100M

OBTAINING AND UPDATING METEOROLOGICAL DATA

STABILITY CLASS (circle one)	DIFFERENTIAL TEMP. C/100M
A	<-1.9
B	-1.9 TO -1.7
C	-1.7 TO -1.5
D	-1.5 TO -0.5
E	-0.5 TO +1.5
F	+1.5 TO +4.0
G	>+4.0

SOURCE TERM DETERMINATION

Part A - Determination of Curies in Containment Atmosphere

This calculation can be performed by obtaining the activity in the containment from the RCD or E&RC lead technician, or by calculating it using the radiation monitor data and their sensitivities. When calculations are performed utilizing radiation levels obtained from R-2, consideration should be given to background correcting the radiation level.

1) Containment atmospheric activity:

- As determined by sampling CV atmosphere: _____ µCi/cc
- Calculation of atmospheric activity from a CV radiation monitor:

Monitor	Reading		Sensitivity*		CV Activity
R-12	_____cpm	/	_____cpm/(µCi/cc)	=	_____µCi/cc
R-2	_____mrem/hr	/	_____(mrem/hr)/(µCi/cc)	=	_____µCi/cc
R-32A/B	_____rem/hr	/	_____(rem/hr)/(µCi/cc)	=	_____µCi/cc

2) Equation for determining curies in containment:

Curies in containment[1] = (CV activity [µCi/cc]) (5.7 x 10^4 [Ci-cc/µCi])

= (_____[µCi/cc]) (5.7 x 10^4 [Ci-cc/µCi])

= _____ Ci

* This value can be determined by referencing Attachment 8.3.5.9, Table 2. Ensure that the sensitivity that corresponds to the correct accident and shutdown time are used.

[1] Containment volume as calculated per RNP-C/CONT-1002, Determination of Containment Heat Sink, is 2.013 x 10^6 cubic feet (5.7 x 10^{10} cc). The value of 5.7 x 10^4 is used to account for µCi to Ci conversion.

SOURCE TERM DETERMINATION

Part B - Determination of Curies in the Reactor Coolant System (RCS)

Obtain the RCS activity from the RCD or the E&RC lead technician to perform this calculation.

1) RCS activity: _____ µCi/ml

2) Equation for determining curies in the RCS:

Curies in RCS = (RCS activity [µCi/ml]) (2.65 x 10^2 Ci-ml/µCi)

= (_____[µCi/ml]) (2.65 x 10^2 Ci-ml/µCi)

= _____ Ci

Part C - Determination of Sump Source Term

Obtain the sump activity and the sump volume from the RCD or the E&RC lead technician in order to perform this calculation.

1) Quantity of liquid in sump _____ gal

2) Sump activity _____ µCi/cc

3) Equation for determining curies in sump:

Curies in the sump =

(volume of liquid in sump [gal]) (activity of sump [µCi/ml]) (3.79 x 10^{-3})

= (_____ [gal]) (_____[µCi/ml]) (3.79 x 10^{-3} Ci-ml/µCi-gal)

= _____ Ci

Part D - Determination of Primary to Secondary Leakage Source Term

Obtain the primary to secondary leak rate and RCS activity in order to perform this calculation.

1) Primary to Secondary Leakage _____ gal/min

2) Source Term (Ci) = (Leakrate gal/min)(6.3E-5)(RCS Activity µCi/cc)

= (_____ gpm)(6.3E-5)(_____ µCi/cc)

= (_____ Ci/sec)(_____ hrs)(3600 sec/hr)

= _____ Ci

SOURCE TERM DETERMINATION

Part E - Determination of Source Term Released Due To Secondary Leakage

Determine the leakrate from the PORV or SRVs using Attachment 8.3.5.8. If the leak is due to a faulted Main Steam System obtain an estimate of the leakrate can be obtained from the Accident Assessment Team.

1) Secondary Leakrate _____ cc/sec

2) Source Term (Ci) =

_____ mrem/hr x _____ hr x _____ cc/sec x 3.6E-03 Ci-sec/μCi-hr
R-31 Rad Level Duration Leakrate
_____ (mrem/hr)/(μCi/cc)
*R-31 Sensitivity
= _____ Ci

* This value can be determined by referencing Attachment 8.3.5.9, Table 2. Ensure that the sensitivity that corresponds to the correct accident and shutdown time are used.

Part F - Determination of Source Term Released Through Main Steam Using Direct Survey

Request that the RCD dispatch a member of the plant monitoring team with an extendable probe survey instrument to a location one level below the Main Steam lines as indicated by Attachment 8.3.5.10. The probe should be extended to a position adjacent to the low point of each steam line (or as directed by the Dose Projection Teamleader or RCD) to determine the contact dose rate. The status (open/closed) of the PORV and SRVs on the monitored lines should also be noted.

1) Contact radiation level on Steam Line: _____ mrem/hr

2) Flow Rate:_____ cc*/sec (Attachment 8.3.5.8 or Accident Assessment Team)

3) Detector Sensitivity from Attachment 8.3.5.9, Table 1: _____ (mrem/hr)/(μCi/cc*)

4) Source Term (Ci) =

_____ mrem/hr x _____ hr x _____ cc*/sec x 3.6E-03 Ci-sec/μCi-hr
Rad Level Duration Flow Rate
_____ (mrem/hr)/(μCi/cc*)
Detector Sensitivity
= _____ Ci

* Substitute ml for cc when calculations are performed for water filled main steam lines.

SOURCE TERM DETERMINATION

Part G - Determination of Source Term Released Plant Vent Stack

Request that the RCD dispatch a member of the plant monitoring team with an extendable probe survey instrument to obtain a contact radiation level on the side of the plant stack (an instrument with a remote probe can also be used). The measurement should be made inside the shielded orifice which is approximately 4 feet above the Auxiliary Building roof on the south side of the stack.

1) Contact radiation level on Plant Vent Stack: _____ mrem/hr

2) Release rate = (Use Attachment 8.3.5.8)

= (Stack Flow Rate [cfm]) (28320 [cc/ft^3]) (60 [min/hr])
= (_____ cfm) (28320 cc/ft^3) (60 min/hr)
= _____ cc/hr

3) Detector Sensitivity from Attachment 8.3.5.9, Table 1: _____ (mrem/hr)/(μCi/cc)

4) Source Term (Ci) =

_____ mrem/hr x _____ hr x _____ cc/hr x 1E-06 Ci/μCi
Rad Level Duration Release Rate
_____ (mrem/hr)/(μCi/cc)
Sensitivity
= _____ Ci

FLOW RATES

R-11, R-12, R-14

HVE-2A/B ..... 4.4×10^4 cfm

HVE-2A/B and HVE-15/15A. ..... 5.5×10^4 cfm

HVE-2A/B and HVE-1A/B ..... 6.2×10^4 cfm

HVE-2A/B and HVE-1A/B & HVE-15/15A ..... 7.2×10^4 cfm

R-15, Air Ejector - Noble Gas

Flow Rate = 3.10×10^2 cfm (for one vacuum pump running)

Flow Rate = 6.10×10^2 cfm (for two vacuum pumps running)

R-20, R-30, Fuel Building Basement Exhaust - Low and High Range Noble Gas

Flow Rate = 1.0×10^4 cfm

R-21, Fuel Building UPPER Level Exhaust

Flow Rate = 1.34×10^4 cfm

R-31A, R-31B, R-31C - Steam-Line Monitors (at 800 psi)

PORV (100% lift)..... 1.92E06 cc/sec (4.57E05 lbm/hr)

PORV and 1 SRV ..... 4.00E06 cc/sec (9.51E05 lbm/hr)

PORV and 2 SRV ..... 6.11E06 cc/sec (1.45E06 lbm/hr)

PORV and 3 SRV ..... 9.19E06 cc/sec (2.19E06 lbm/hr)

FLOW RATES

R-31A, R-31B, R-31C - Steam-Line Monitors (Filled with Water)

PORV (100% lift) ..... 7.32E04 ml/sec

PORV AND 1 SRV ..... 1.56EO5 ml/sec

PORV AND 2 SRV ..... 2.42EO5 ml/sec

PORV AND 3 SRV ..... 3.68EO5 ml/sec

R-2, R-32A, R-32B - Containment Radiation Monitors

Containment isolated with no discharge via plant vent ..... 1.5 CFM[1]

Containment vented via plant vent .....2500 CFM

[1] Design basis leakage for containment at 0.1% containment volume per day.

FLOW RATES

STEAM LINE FLOW RATE CALCULATION FOR A DRY STEAM GENERATOR

1.0

1. RCS Leak Rate (RCS_{LR}) _____ gpm
2. RCS Temperature _____ °F
3. RCS Pressure _____ psig
4. S/G Pressure _____ psig
5. S/G Temp _____ °F

2.0 1. From the Steam Tables determine the specific volume of RCS Fluid (RCS_{SV}) at conditions in 1.0 _____ ft^3/lb

2. From the Steam Tables determine the specific volume of S/G Fluid (SG_{SV}) at condition in 1.0 _____ ft^3/lb

3.0 Determine the RCS Mass Release Rate (RCS_{MRR}) into S/G by using the following formula:

$$\frac{RCS_{LR}\ (gal/^{min})}{(7.48\ gal/ft^3)\ (RCS_{SV}\ ft^3/lb)} = lb/min$$

$$\frac{(\_\_\_\_RCS_{LR}\ gal/^{min})}{(7.48\ gal/ft^3)\ (\_\_\_\_\_RCS_{SV}\ ft^3/lb)} = \_\_\_\_\_\ lb/min$$

4.0 Determine the steam flow rate using the following formula:

$$RCS_{MRR}\ (lb/min)\ SG_{SV}\ (ft^3/lb)\ \frac{(472\ cc/sec)}{ft^3/min} = cc/sec$$

$$\frac{(\_\_\_\_\_)}{RCS_{MRR}\ (lb/min)}\ \frac{(\_\_\_\_\_)}{SG_{SV}\ (ft^3/lb)}\ \frac{(472\ cc/sec)}{ft^3/min} = \frac{\_\_\_\_\_}{cc/sec}$$

5.0 Performed by: _____

Verified by: _____

FLOW RATES

CONVERSION OF STEAM MASS FLOW RATE TO VOLUMETRIC FLOW RATE [1]

1. Obtain and record the steam mass flow rate in lbs/hr from the Accident Assessment Team.

   _____ lbs/hr [1]

2. Obtain and record the main steam pressure in psig.

   _____ psig

3. Use the figure on the following page to determine the specific volume (cc/lb) for the pressure determined in step 2.

   _____ cc/lb [2]

4. Determine the volumetric flow rate using the following formula:

   (lbs/hr) (1 hr/3600 sec) (cc/lb) = cc/sec

   (_____ lb/hr) (1 hr/3600 sec) (_____ cc/lb) = _____ cc/sec
   [1] [2]

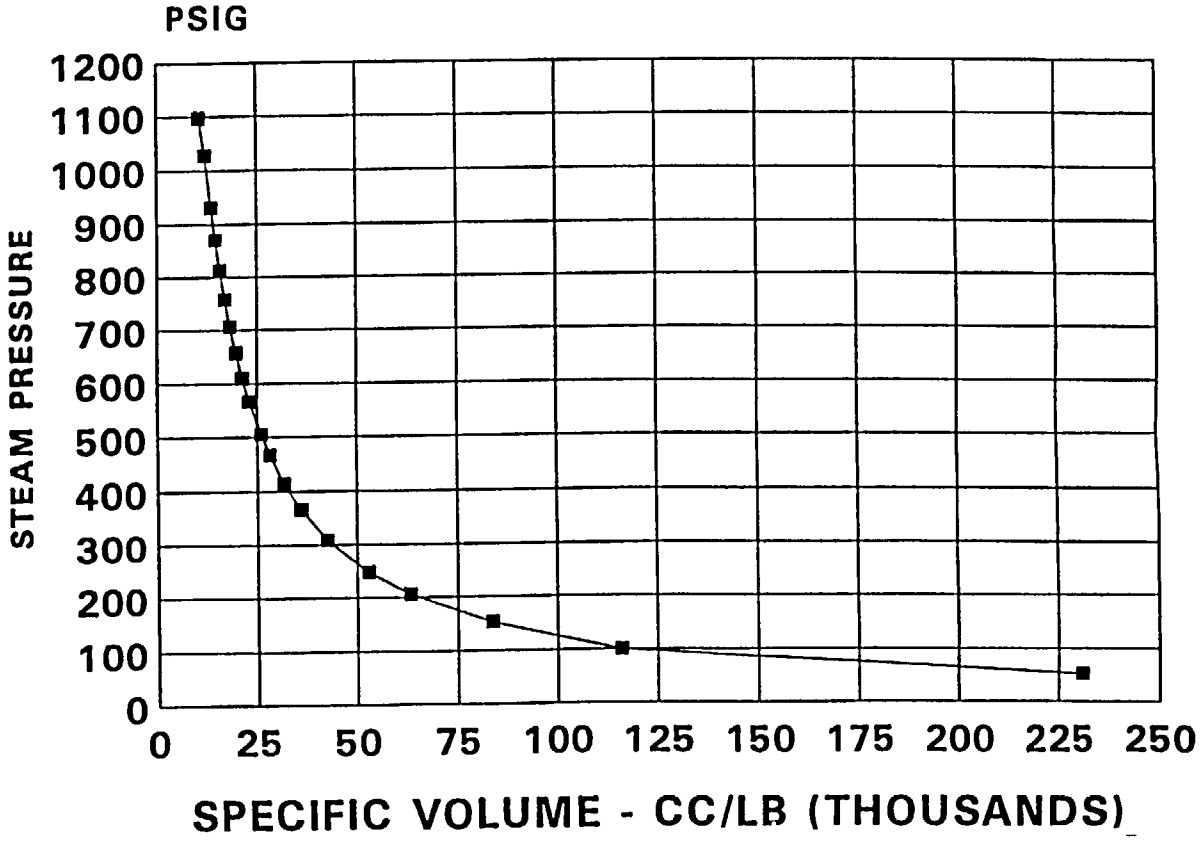
Performed by: _____ _____/_____
Date Time

Verified by: _____ _____/_____
Date Time

[1] For use with R-31 readings under any conditions.

STEAM PRESSURE VS SPECIFIC VOLUME

PSIG VS CC PER POUND



DETECTOR SENSITIVITIES

Determine the appropriate accident scenario classification (1-10) utilizing the following table.

ACCIDENT SCENARIO	PLANT CONDITIONS	FILTRATION/PARTITIONING/SPRAYS
1	Core not uncovered	Effective or Not Effective
2	Core uncovered <30 minutes	Effective
3	Core uncovered <30 minutes	Not Effective
4	Core uncovered 0.5 - 1.8 hours	Effective
5	Core uncovered 0.5 - 1.8 hours	Not Effective
6	Core uncovered > 1.8 hours	Effective
7	Core uncovered > 1.8 hours	Not Effective
8	New Spent Fuel	Effective or Not Effective
9	Old Spent Fuel	Effective or Not Effective
10	Waste Gas Decay Tank	Effective or Not Effective

Determine the sensitivity of the appropriate detector using the following tables and accident scenarios. (The sensitivities in Table 1 below are based on nuclide mixes at reactor shutdown). Table 2 provides detector efficiencies(sensitivities) for eight (8) designated accident categories and time steps for each accident sequence.

Table 1

ACCIDENT SCENARIO	PLANT VENT STACK(mrem/hr)/(μCi/cc)	STEAM FILLEDMAIN STEAM LINE(mrem/hr)/(μCi/cc)	WATER FILLED MAIN STEAM LINE(mrem/hr)/(μCi/ml)
1	3.28E+02	1.49E+01	4.51E+00
2	1.42E+03	7.11E+01	2.15E+01
3	2.63E+03	9.66E+01	2.35E+01
4	1.40E+03	7.08E+01	2.16E+01
5	1.98E+03	7.94E+01	2.09E+01
6	1.40E+03	7.08E+01	2.15E+01
7	2.20E+03	8.24E+01	2.06E+01
8	2.80E+03	N/A	N/A
9	5.44E+00	N/A	N/A
10	2.48E-01	N/A	N/A

DETECTOR SENSITIVITIES

Table 2: Summary of Detector Sensitivities(Efficiencies) for Designated Accident Scenarios

Accident Time step	R-14C cpm per uCi/cc	R-14D cpm per uCi/cc	R-14E cpm per uCi/cc	R-12 cpm per uCi/cc	R-20 cpm per uCi/cc	R-21 cpm per uCi/cc	R-15 cpm per uCi/cc	R-02 mR/hr per uCi/cc	R-30 mR/hr per uCi/cc	R-31A,B,C mR/hr per uCi/cc	R-32A R/hr per uCi/cc	R-32B R/hr per uCi/cc
Accident 1 Normal RCS												
t=0	1.50E+07	3.94E+03	2.58E+00	3.03E+07	3.17E+07	3.25E+07	4.42E+05	9.2E+03	6.1E+01	1.1E+01	9.2E+00	9.2E+00
t=0.5	1.41E+07	3.71E+03	2.43E+00	2.76E+07	2.90E+07	2.97E+07	3.54E+05	6.9E+03	3.6E+01	6.3E+00	6.9E+00	6.9E+00
t=1	1.38E+07	3.63E+03	2.38E+00	2.68E+07	2.81E+07	2.87E+07	3.23E+05	6.2E+03	2.9E+01	4.9E+00	6.2E+00	6.2E+00
t=2	1.36E+07	3.57E+03	2.34E+00	2.61E+07	2.74E+07	2.80E+07	2.97E+05	5.4E+03	2.0E+01	3.4E+00	5.4E+00	5.4E+00
t=4	1.33E+07	3.50E+03	2.29E+00	2.54E+07	2.66E+07	2.73E+07	2.64E+05	5.0E+03	1.5E+01	2.5E+00	5.0E+00	5.0E+00
t=8	1.31E+07	3.43E+03	2.25E+00	2.47E+07	2.59E+07	2.65E+07	2.20E+05	4.3E+03	8.4E+00	1.3E+00	4.3E+00	4.3E+00
t=16	1.29E+07	3.38E+03	2.21E+00	2.41E+07	2.53E+07	2.59E+07	1.73E+05	4.0E+03	4.5E+00	6.6E-01	4.0E+00	4.0E+00
t=32	1.29E+07	3.40E+03	2.23E+00	2.41E+07	2.53E+07	2.59E+07	1.36E+05	3.8E+03	3.3E+00	5.0E-01	3.8E+00	3.8E+00
Accident 2 Core uncovered < 30 minutes/ mechanical damage with sprays/filtration effective												
t=0	3.26E+07	8.59E+03	5.62E+00	6.42E+07	6.74E+07	6.90E+07	3.41E+06	4.2E+04	4.0E+02	7.2E+01	4.2E+01	4.2E+01
t=0.5	3.10E+07	8.16E+03	5.34E+00	5.33E+07	5.60E+07	5.73E+07	3.70E+06	3.3E+04	3.0E+02	5.4E+01	3.3E+01	3.3E+01
t=1	3.04E+07	8.00E+03	5.24E+00	4.84E+07	5.08E+07	5.20E+07	3.87E+06	2.8E+04	2.5E+02	4.4E+01	2.8E+01	2.8E+01
t=2	3.01E+07	7.91E+03	5.18E+00	4.44E+07	4.66E+07	4.77E+07	4.07E+06	2.4E+04	2.0E+02	3.6E+01	2.4E+01	2.4E+01
t=4	2.98E+07	7.85E+03	5.14E+00	4.02E+07	4.22E+07	4.32E+07	4.33E+06	1.9E+04	1.4E+02	2.5E+01	1.9E+01	1.9E+01
t=8	2.96E+07	7.78E+03	5.10E+00	3.53E+07	3.70E+07	3.79E+07	4.63E+06	1.3E+04	8.0E+01	1.3E+01	1.3E+01	1.3E+01
t=16	2.94E+07	7.73E+03	5.06E+00	3.05E+07	3.20E+07	3.27E+07	4.90E+06	9.0E+03	3.6E+01	4.7E+00	9.0E+00	9.0E+00
t=32	2.92E+07	7.69E+03	5.04E+00	2.67E+07	2.80E+07	2.87E+07	5.11E+06	7.7E+03	2.0E+01	1.8E+00	7.7E+00	7.7E+00

Detector sensitivities derived from Calculation No. RNP-M/MECH 1746.

DETECTOR SENSITIVITIES

Table 2: Summary of Detector Sensitivities(Efficiencies) for Designated Accident Scenarios

Accident Time step	R-14C cpm per uCi/cc	R-14D cpm per uCi/cc	R-14E cpm per uCi/cc	R-12 cpm per uCi/cc	R-20 cpm per uCi/cc	R-21 cpm per uCi/cc	R-15 cpm per uCi/cc	R-02 mR/hr per uCi/cc	R-30 mR/hr per uCi/cc	R-31A,B,C mR/hr per uCi/cc	R-32A R/hr per uCi/cc	R-32B R/hr per uCi/cc
Accident 3 Core uncovered < 30 minutes/ mechanical damage with sprays/filtration NOT effective												
t=0	1.55E+07	4.08E+03	2.67E+00	7.03E+07	7.38E+07	7.55E+07	1.62E+06	7.3E+04	7.4E+02	1.3E+02	7.3E+01	7.3E+01
t=0.5	1.34E+07	3.53E+03	2.31E+00	6.60E+07	6.93E+07	7.09E+07	1.60E+06	6.7E+04	6.8E+02	1.2E+02	6.7E+01	6.7E+01
t=1	1.30E+07	3.42E+03	2.24E+00	6.39E+07	6.71E+07	6.86E+07	1.65E+06	6.2E+04	6.2E+02	1.1E+02	6.2E+01	6.2E+01
t=2	1.32E+07	3.47E+03	2.27E+00	6.15E+07	6.45E+07	6.60E+07	1.79E+06	5.4E+04	5.3E+02	9.1E+01	5.4E+01	5.4E+01
t=4	1.37E+07	3.59E+03	2.35E+00	5.82E+07	6.11E+07	6.25E+07	1.98E+06	4.4E+04	4.2E+02	7.2E+01	4.4E+01	4.4E+01
t=8	1.42E+07	3.72E+03	2.44E+00	5.38E+07	5.65E+07	5.78E+07	2.21E+06	3.4E+04	3.2E+02	5.4E+01	3.4E+01	3.4E+01
t=16	1.50E+07	3.95E+03	2.59E+00	4.81E+07	5.05E+07	5.17E+07	2.50E+06	2.5E+04	2.3E+02	3.8E+01	2.5E+01	2.5E+01
t=32	1.63E+07	4.28E+03	2.81E+00	4.10E+07	4.30E+07	4.40E+07	2.84E+06	1.9E+04	1.6E+02	2.5E+01	1.9E+01	1.9E+01
Accident 4 Core uncovered 0.5 < 1.8 hours with sprays/filtration effective												
t=0	3.32E+07	8.74E+03	5.72E+00	6.40E+07	6.71E+07	6.87E+07	3.47E+06	4.2E+04	4.0E+02	7.2E+01	4.2E+01	4.2E+01
t=0.5	3.17E+07	8.34E+03	5.46E+00	5.28E+07	5.54E+07	5.67E+07	3.78E+06	3.3E+04	3.0E+02	5.4E+01	3.3E+01	3.3E+01
t=1	3.11E+07	8.18E+03	5.35E+00	4.78E+07	5.01E+07	5.13E+07	3.96E+06	2.8E+04	2.5E+02	4.4E+01	2.8E+01	2.8E+01
t=2	3.07E+07	8.07E+03	5.29E+00	4.37E+07	4.59E+07	4.70E+07	4.16E+06	2.4E+04	2.0E+02	3.6E+01	2.4E+01	2.4E+01
t=4	3.04E+07	7.99E+03	5.23E+00	3.95E+07	4.14E+07	4.24E+07	4.41E+06	1.9E+04	1.4E+02	2.5E+01	1.9E+01	1.9E+01
t=8	3.01E+07	7.92E+03	5.18E+00	3.46E+07	3.63E+07	3.72E+07	4.71E+06	1.3E+04	8.0E+01	1.3E+01	1.3E+01	1.3E+01
t=16	2.98E+07	7.84E+03	5.14E+00	2.99E+07	3.13E+07	3.21E+07	4.97E+06	9.0E+03	3.6E+01	4.7E+00	9.0E+00	9.0E+00
t=32	2.96E+07	7.79E+03	5.10E+00	2.63E+07	2.76E+07	2.82E+07	5.17E+06	7.7E+03	2.0E+01	1.8E+00	7.7E+00	7.7E+00

Detector sensitivities derived from Calculation No. RNP-M/MECH 1746, (EC 49849, Set-Point, Declaration Evaluation for EP)

DETECTOR SENSITIVITIES

Table 2: Summary of Detector Sensitivities(Efficiencies) for Designated Accident Scenarios

Accident Time step	R-14C cpm per uCi/cc	R-14D cpm per uCi/cc	R-14E cpm per uCi/cc	R-12 cpm per uCi/cc	R-20 cpm per uCi/cc	R-21 cpm per uCi/cc	R-15 cpm per uCi/cc	R-02 mR/hr per uCi/cc	R-30 mR/hr per uCi/cc	R-31A,B,C mR/hr per uCi/cc	R-32A R/hr per uCi/cc	R-32B R/hr per uCi/cc
Accident 5 Core uncovered 0.5 < 1.8 hours with sprays/filtration NOT effective												
t=0	2.26E+07	5.94E+03	3.89E+00	6.67E+07	7.00E+07	7.16E+07	2.36E+06	5.9E+04	5.9E+02	1.0E+02	5.9E+01	5.9E+01
t=0.5	2.03E+07	5.33E+03	3.49E+00	5.97E+07	6.26E+07	6.41E+07	2.42E+06	5.3E+04	5.2E+02	9.0E+01	5.3E+01	5.3E+01
t=1	1.97E+07	5.18E+03	3.39E+00	5.64E+07	5.92E+07	6.06E+07	2.51E+06	4.8E+04	4.7E+02	8.1E+01	4.8E+01	4.8E+01
t=2	1.97E+07	5.19E+03	3.40E+00	5.32E+07	5.58E+07	5.71E+07	2.67E+06	4.1E+04	4.0E+02	6.8E+01	4.1E+01	4.1E+01
t=4	2.00E+07	5.26E+03	3.44E+00	4.93E+07	5.18E+07	5.30E+07	2.90E+06	3.3E+04	3.0E+02	5.2E+01	3.3E+01	3.3E+01
t=8	2.03E+07	5.34E+03	3.50E+00	4.45E+07	4.67E+07	4.78E+07	3.18E+06	2.4E+04	2.1E+02	3.5E+01	2.4E+01	2.4E+01
t=16	2.09E+07	5.49E+03	3.60E+00	3.90E+07	4.09E+07	4.19E+07	3.48E+06	1.8E+04	1.4E+02	2.2E+01	1.8E+01	1.8E+01
t=32	2.18E+07	5.72E+03	3.75E+00	3.32E+07	3.49E+07	3.57E+07	3.80E+06	1.3E+04	8.9E+01	1.4E+01	1.3E+01	1.3E+01
Accident 6 Core uncovered > 1.8 hours with sprays/filtration effective												
t=0	3.29E+07	8.64E+03	5.66E+00	6.38E+07	6.70E+07	6.85E+07	3.43E+06	4.2E+04	4.0E+02	7.2E+01	4.2E+01	4.2E+01
t=0.5	3.13E+07	8.22E+03	5.38E+00	5.28E+07	5.54E+07	5.66E+07	3.73E+06	3.3E+04	3.0E+02	5.4E+01	3.3E+01	3.3E+01
t=1	3.06E+07	8.06E+03	5.27E+00	4.78E+07	5.01E+07	5.13E+07	3.90E+06	2.8E+04	2.5E+02	4.4E+01	2.8E+01	2.8E+01
t=2	3.02E+07	7.95E+03	5.21E+00	4.37E+07	4.59E+07	4.70E+07	4.10E+06	2.4E+04	2.0E+02	3.6E+01	2.4E+01	2.4E+01
t=4	2.99E+07	7.88E+03	5.16E+00	3.95E+07	4.15E+07	4.24E+07	4.35E+06	1.9E+04	1.4E+02	2.5E+01	1.9E+01	1.9E+01
t=8	2.97E+07	7.80E+03	5.11E+00	3.46E+07	3.64E+07	3.72E+07	4.64E+06	1.3E+04	8.0E+01	1.3E+01	1.3E+01	1.3E+01
t=16	2.94E+07	7.73E+03	5.06E+00	2.99E+07	3.14E+07	3.21E+07	4.90E+06	9.0E+03	3.6E+01	4.7E+00	9.0E+00	9.0E+00
t=32	2.92E+07	7.68E+03	5.03E+00	2.62E+07	2.75E+07	2.82E+07	5.10E+06	7.7E+03	2.0E+01	1.8E+00	7.7E+00	7.7E+00

Detector sensitivities derived from Calculation No. RNP-M/MECH 1746, (EC 49849, Set-Point, Declaration Evaluation for EP).

DETECTOR SENSITIVITIES

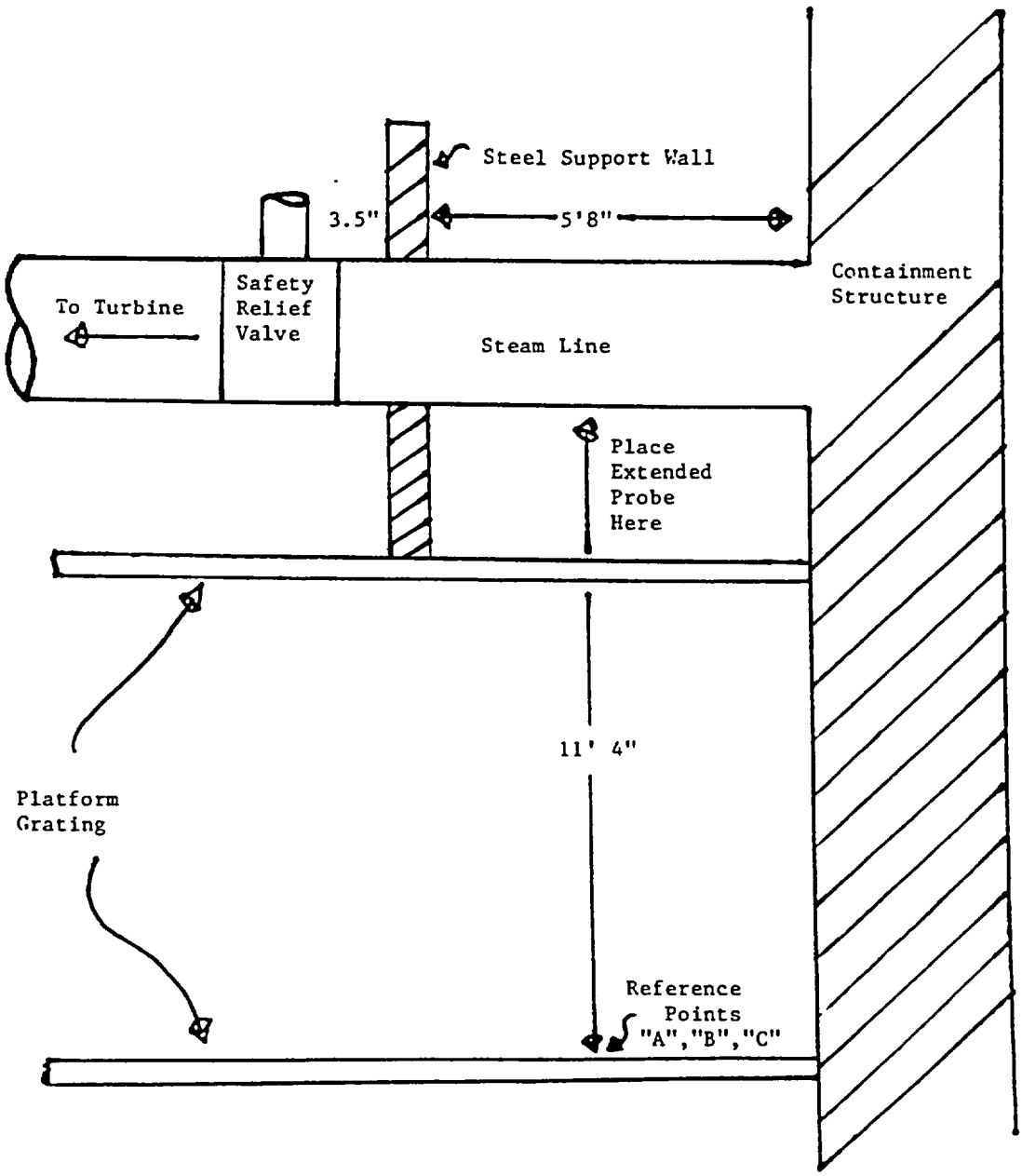
Table 2: Summary of Detector Sensitivities(Efficiencies) for Designated Accident Scenarios

Accident Time step	R-14C cpm per uCi/cc	R-14D cpm per uCi/cc	R-14E cpm per uCi/cc	R-12 cpm per uCi/cc	R-20 cpm per uCi/cc	R-21 cpm per uCi/cc	R-15 cpm per uCi/cc	R-02 mR/hr per uCi/cc	R-30 mR/hr per uCi/cc	R-31A,B,C mR/hr per uCi/cc	R-32A R/hr per uCi/cc	R-32B R/hr per uCi/cc
Accident 7 Core uncovered > 1.8 hours with sprays/filtration NOT effective												
t=0	1.75E+07	4.60E+03	3.01E+00	6.32E+07	6.63E+07	6.78E+07	1.83E+06	6.6E+04	6.6E+02	1.1E+02	6.6E+01	6.6E+01
t=0.5	1.51E+07	3.98E+03	2.60E+00	5.70E+07	5.98E+07	6.12E+07	1.80E+06	6.0E+04	5.6E+02	1.0E+02	6.0E+01	6.0E+01
t=1	1.45E+07	3.82E+03	2.50E+00	5.40E+07	5.67E+07	5.80E+07	1.85E+06	5.5E+04	5.1E+02	9.4E+01	5.5E+01	5.5E+01
t=2	1.45E+07	3.81E+03	2.49E+00	5.09E+07	5.34E+07	5.46E+07	1.96E+06	4.8E+04	4.7E+02	8.0E+01	4.8E+01	4.8E+01
t=4	1.46E+07	3.84E+03	2.51E+00	4.70E+07	4.93E+07	5.04E+07	2.12E+06	3.8E+04	3.7E+02	6.3E+01	3.8E+01	3.8E+01
t=8	1.47E+07	3.88E+03	2.54E+00	4.22E+07	4.43E+07	4.53E+07	2.31E+06	2.9E+04	2.6E+02	4.5E+01	2.9E+01	2.9E+01
t=16	1.51E+07	3.98E+03	2.61E+00	3.67E+07	3.85E+07	3.94E+07	2.53E+06	2.1E+04	1.7E+02	3.0E+01	2.1E+01	2.1E+01
t=32	1.59E+07	4.17E+03	2.73E+00	3.08E+07	3.23E+07	3.30E+07	2.77E+06	1.6E+04	1.2E+02	1.9E+01	1.6E+01	1.6E+01
Accident 8 Spent Fuel Assembly (Gap)												
t=0	3.26E+07	8.59E+03	5.62E+00	6.42E+07	6.74E+07	6.90E+07	N/A	4.2E+04	4.0E+02	N/A	4.2E+01	4.2E+01
t=0.5	3.10E+07	8.16E+03	5.35E+00	5.33E+07	5.60E+07	5.73E+07	N/A	3.3E+04	3.0E+02	N/A	3.3E+01	3.3E+01
t=1	3.04E+07	8.00E+03	5.24E+00	4.84E+07	5.08E+07	5.20E+07	N/A	2.8E+04	2.5E+02	N/A	2.8E+01	2.8E+01
t=2	3.01E+07	7.91E+03	5.18E+00	4.44E+07	4.66E+07	4.77E+07	N/A	2.4E+04	2.0E+02	N/A	2.4E+01	2.4E+01
t=4	2.98E+07	7.85E+03	5.14E+00	4.02E+07	4.22E+07	4.32E+07	N/A	1.9E+04	1.4E+02	N/A	1.9E+01	1.9E+01
t=8	2.96E+07	7.78E+03	5.10E+00	3.53E+07	3.70E+07	3.79E+07	N/A	1.3E+04	8.0E+01	N/A	1.3E+01	1.3E+01
t=16	2.94E+07	7.73E+03	5.06E+00	3.05E+07	3.20E+07	3.27E+07	N/A	9.0E+03	3.6E+01	N/A	9.0E+00	9.0E+00
t=32	2.92E+07	7.69E+03	5.04E+00	2.67E+07	2.80E+07	2.87E+07	N/A	7.7E+03	2.0E+01	N/A	7.7E+00	7.7E+00

Detector sensitivities derived from Calculation No. RNP-M/MECH 1746, (EC 49849, Set-Point, Declaration Evaluation for EP)

ATTACHMENT 8.3.5.10
Page 1 of 1

MEASURING RADIATION LEVEL ON MAIN STEAM LINES



TYPICAL RMS VALUES

The background and alarm setpoint for radiation monitors should be obtained from the control room or other current sources if they are needed to perform dose projections. The following two tables provide the typical values for the background and alarm setpoints for radiation monitors, however **these values should not be used for performing dose projections unless no other data is available.** Table 1 contains all of the radiation monitors that are used for dose projections, while Table 2 contains other monitors that may be of interest to the dose projection team.

TABLE 1:

RADIATION MONITOR	CHANNEL DESCRIPTION	TYPICAL* BKG/SETPOINT	SCALE
R2	CV LOW RANGE AREA	~ 10 / 100 mR/HR	0.1 - 10,000 mR/HR
R12	CV AIR GAS	~ 1 K / 2.2 K CPM = 1.8 times BKG	10 -10,000,000 CPM
R14C	PLANT VENT GAS LOW Default 1 M in high range.	30-60/~10,000 CPM switch to high range ~ 700 k CPM	10 - 1,000,000 CPM or 10 M at monitor all R-14 channels
R14D	PLANT VENT GAS MID Default 10 in low range	10-11 / 130 CPM	10 - 1,000,000 CPM
R14E	PLANT VENT GAS HIGH Default 10 in low range	10-11 / BKG + 17 CPM	10 - 1,000,000 CPM
R15	CONDENSER AIR EJECTOR	10-15 /100+BKG CPM	10 - 1,000,000 CPM
R20	LOWER FUEL HANDLING BUILDING low range	10-40 / 9,800 CPM	10 -10,000,000 CPM
R21	UPPER FUEL HANDLING FUEL HANDLING	10-25 / 9,730 CPM	10 -10,000,000 CPM
R30	LOWER FUEL HANDLING BUILDING high range	~ 0.5 / 18+BKG mR/HR	1 - 100,000 mR/HR
R31A	MAIN STEAM LINE A	~ 0.3 / 12 mR/HR	1 - 100,000 mR/HR
R31B	MAIN STEAM LINE B	~ 0.4 / 12 mR/HR	1 - 100,000 mR/HR
R31C	MAIN STEAM LINE C	~ 0.6 / 12 mR/HR	1 - 100,000 mR/HR
R32A	CV HIGH RANGE	<1/ 10&1,000 R/HR	1-10,000,000 R/HR
R32B	CV HIGH RANGE	<1/ 10&1,000 R/HR	1-10,000,000 R/HR

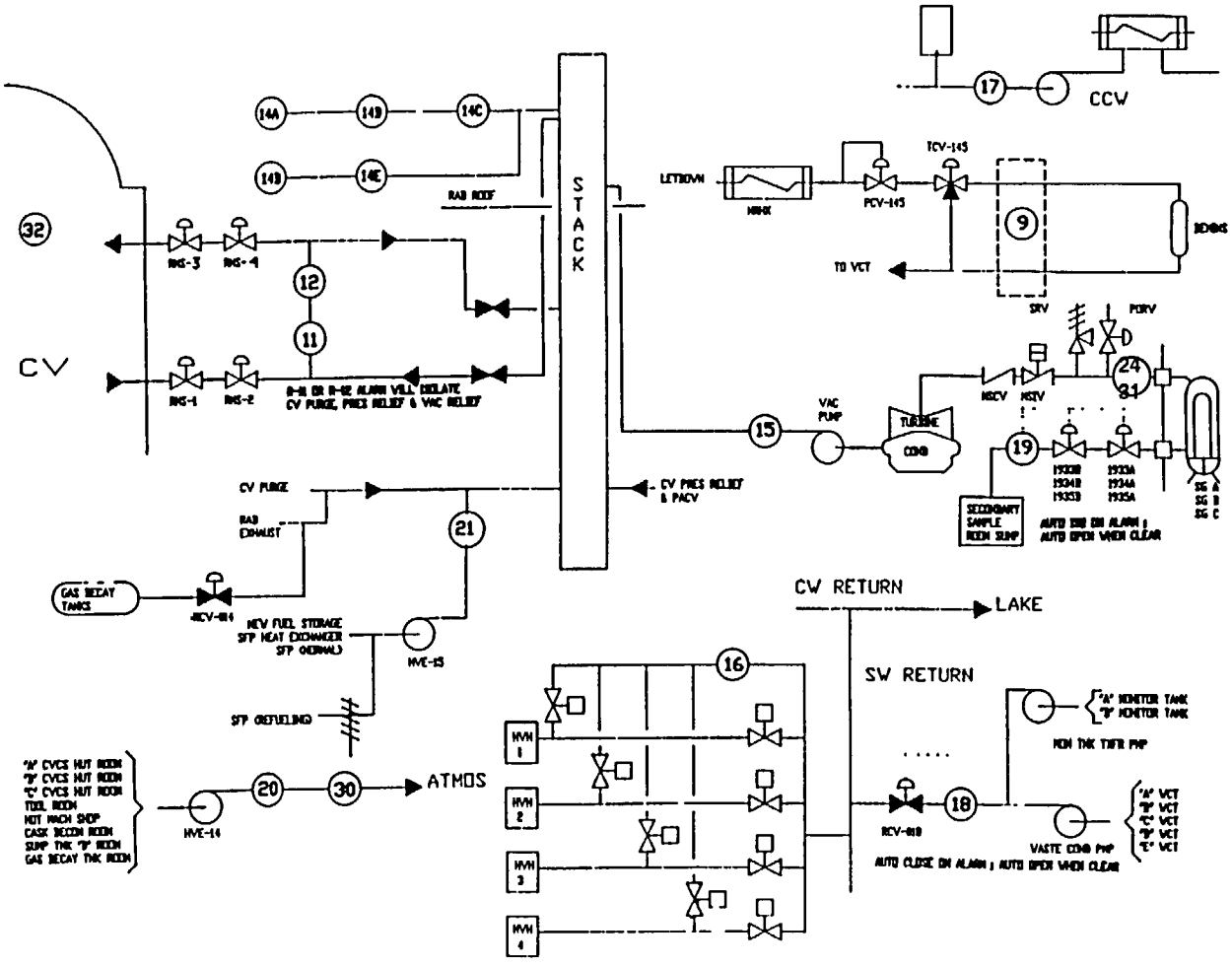
* A printscreen can be performed on either the EDS terminal or ERFIS at the onset of an accident to provide more current backgrounds for monitors that are not yet being effected by the accident.

TYPICAL RMS VALUES

TABLE 2:

RADIATION MONITOR	CHANNEL DESCRIPTION	TYPICAL BKG/SETPOINT	SCALE
R1	CONTROL ROOM AREA	<1 / 2.5 mR/HR	0.1 - 10,000 mR/HR
R3	PASS PANEL AREA	0.1-0.3/ 20 mR/HR	0.1 - 10,000 mR/HR
R4	CHARGING PUMP AREA	~4 / 50 mR/HR	0.1 - 10,000 mR/HR
R5	SPENT FUEL BLDG. AREA	<1 / 50 mR/HR	0.1 - 10,000 mR/HR
R6	SAMPLING ROOM AREA	<1 / 50 mR/HR	0.1 - 10,000 mR/HR
R7	IN-CORE INSTRUMENT AREA	~4 / 200 mR/HR	0.1 - 10,000 mR/HR
R8	DRUMMING ROOM	1-2 / 50 mR/HR	0.1 - 10,000 mR/HR
R9	LETDOWN LINE AREA	10-40/ 3000 mR/HR	1 - 100,000 mR/HR
R11	CV AIR PARTICULATE	~20 K / 3.6E4 CPM = 1.8 times BKG	10 - 1,000,000 CPM
R14A	PLANT VENT PARTICULATE	~500 / 2E6 CPM	10 - 1,000,000 CPM
R14B	PLANT VENT IODINE	~10 / 90,000 CPM	10 - 1,000,000 CPM
R16	HVH COOLING WATER	~300 / 1,900 CPM	10 - 1,000,000 CPM
R17	COMPONENT COOLING WATER	~300 / 830 CPM	10 - 1,000,000 CPM
R18	LIQUID WASTE DISPOSAL	~18,500/ VARIES	10 - 1,000,000 CPM
R19A	SG "A" BLOWDOWN	<2,000/ ~10 K CPM	10 -10,000,000 CPM
R19B	SG "B" BLOWDOWN	<1,000/ ~8 K CPM	10 -10,000,000 CPM
R19C	SG "C" BLOWDOWN	<2,000/ ~10 K CPM	10 -10,000,000 CPM
R22P	E&RC BLDG. PARTICULATE	~300 / 10,000 CPM	1 - 1,000,000 CPM
R22I	E&RC BUILDING IODINE	~15 / 300 CPM	1 - 1,000,000 CPM
R22NG	E&RC BUILDING NG	~40 / 1,000 CPM	1 - 1,000,000 CPM
R23P	RADWASTE BLDG. PART.	~60 / 9,700 CPM	1 - 1,000,000 CPM
R23I	RADWASTE BLDG. IODINE	<10 / 1090 CPM	1 - 1,000,000 CPM
R24A	N-16 MAIN STEAM LINE A	1/5 GPD	1 - 150 GPD
R24B	N-16 MAIN STEAM LINE B	1/5 GPD	1 - 150 GPD
R24C	N-16 MAIN STEAM LINE C	1/5 GPD	1 - 150 GPD
R23NG	RADWASTE BLDG. NG	~20 / 387 CPM	1 - 1,000,000 CPM
R33	MONITOR BLDG. AREA	<1 / 10 mR/HR	1 - 100,000 mR/HR
R37	COND. POLISHER	~100 /18,500 CPM	10 -10,000,000 CPM
R38P	EOF PARTICULATE	~900 / 32,000 CPM	10 - 1,000,000 CPM
R38I	EOF IODINE	~10 / 802 CPM	10 - 1,000,000 CPM
R38NG	EOF NOBLE GAS	~25 / 935 CPM	10 - 1,000,000 CPM

RMS MONITORED SYSTEMS



WEATHER SERVICE DATA

1. Call the Weather Service at the Florence Airport , Columbia, South Carolina or Wilmington, North Carolina. Ask for the forecaster on duty and identify yourself by saying, "This is (your name) at the Progress Energy (PGN) H. B. Robinson Nuclear Plant. This is an emergency (or emergency drill). May I have the last hour surface weather observation from Florence, South Carolina?" If the last hour data is not available from Florence, then request the last hour surface weather observation from Columbia. The following data should be obtained:

   1-Hour Forecast

   - Station for which data is given _____
   - Wind Speed (MPH) _____
   - Cloud Cover (in tenths of total) _____
   - Cloud Ceiling (feet above ground) _____
   - Wind Direction (from N,S,E,W,etc.) _____
   - Wind Direction Trends (steady, shifting, variable) _____
   - Precipitation Activity _____
   - Probability of Precipitation _____

2. Also, obtain a 3 hour forecast for Florence from the meteorologist on duty.

   3-Hour Forecast

   - Station for which data is given _____
   - Wind Speed (MPH) _____
   - Cloud Cover (in tenths of total) _____
   - Cloud Ceiling (feet above ground) _____
   - Wind Direction (from N,S,E,W,etc.) _____
   - Wind Direction Trends (steady, shifting, variable) _____
   - Precipitation Activity _____
   - Probability of Precipitation _____

3. Other Information: _____

_____

_____

_____

_____

Date:_____ Time:_____ Name:_____

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ONSITE METEOROLOGICAL DATA

Date:_____

Time	_____	_____	_____	_____
Ground Wind Speed (mph)	_____	_____	_____	_____
Elevated Wind Speed (mph)	_____	_____	_____	_____
Ground Wind Dir. (From)	_____	_____	_____	_____
Elevated Wind Dir. (From)	_____	_____	_____	_____
AMB Temp. (°F)	_____	_____	_____	_____
ΔT (°0/100m)	_____	_____	_____	_____
Stability Class	_____	_____	_____	_____

Time	_____	_____	_____	_____
Ground Wind Speed (mph)	_____	_____	_____	_____
Elevated Wind Speed (mph)	_____	_____	_____	_____
Ground Wind Dir. (From)	_____	_____	_____	_____
Elevated Wind Dir. (From)	_____	_____	_____	_____
AMB Temp. (°F)	_____	_____	_____	_____
ΔT (°0/100m)	_____	_____	_____	_____
Stability Class	_____	_____	_____	_____

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METEOROLOGICAL FORECAST FORM

Date:_____ Time Issued:_____

Issued By:_____ Received By:_____

Forecast Location:_____

A) Next 1 Hour

1) Wind Direction: Sector_____ Deg._____

2) Winds Should Remain (Steady; Shifting; Variable)
2a) Variation Should Be_____ Deg.

3) Wind Velocity:_____ to _____ (MPH)

4) Stability Class_____

5) Precipitation Activity Will Be (None, Scattered, Steady)

6) Precipitation Type (Rain, Rainshowers, Thunderstorms, Ice, Snow)

7) Precipitation Intensity (Light, Moderate, Severe)

B) Next 3 Hours:

_____

_____

C) Next 3 Days:

_____

_____

_____

D) Remarks: _____

_____

_____

_____

HBRDOSE/RASCAL COMPARISON MATRIX

	HBRDOSE	RASCAL	DIFFERENCES/COMMENTS	EFFECTS
EPA 400 Dose factors	Yes	Partial	See Note 1	HBRDOSE will give higher ground exposure doses. Rascal will give higher external doses. TEDE may be affected in either direction.
Reg Guide 1.145 X/Qs	Yes	No	RASCAL uses a single equation with non site-specific wake factors. Also, probably doesn't use plume meander default. RASCAL cap on Sigma z is 500 m. R.G. 1.145 shows 3000 m.	RASCAL generally will use higher X/Q values, especially for ground level releases at closer distances. When using default cap on Sigma z, Rascal will calculate higher doses during unstable met conditions.
Deposition	No	Yes	RASCAL calculates deposition as a separate dose quantity, which does not effect TEDE.	NONE
Depletion	No	No		NONE
Wet Deposition	No	Yes	RASCAL uses a mass balance for wet deposition.	RASCAL immersion and inhalation doses will be lower than HBRDOSE. RASCAL ground doses will be higher.
Finite Model	Yes	Yes	RASCAL converts to a semi-infinite model at Sigma y = 400 m. HBRDOSE uses Sigma y = 500 m. RASCAL uses horizontal dispersion coefficient only in determining plume size. HBRDOSE uses average Sigma.	Conversion point of finite model, semi-infinite model will cause negligible difference. RASCAL use of Sigma y instead of an average sigma as described in "Meteorology and Atomic Energy" may cause a big difference in the calculated gamma dose for non-isotropic plumes.
Decay for TAS	Yes	Yes		NONE
Downwind Decay	No	No		NONE

HBRDOSE/RASCAL COMPARISON MATRIX

	HBRDOSE	RASCAL	DIFFERENCES/COMMENTS	EFFECTS
Daughter Ingrowth	No	Yes	RASCAL calculates ingrowth of daughter decay products.	HBRDOSE may underestimate doses, particularly inhalation doses.
Source Term	RTM-96	NUREG-1228	Different isotopes, RASCAL can dynamically calculate spectrum based on particular accident sequence.	During LOCA sequences, Spent Fuel accidents, or Waste Gas Decay Tank rupture, there should be little difference. Other sequences may cause large differences.
Uses monitor reading for source term	Yes	Yes	RASCAL calculates source term based on user defined parameters and the maximum expected readings for core-damage states. NRC will probably be doing worst case analysis based on specific accident and PRA instead of actual release.	NRC predicted dose may be higher. PGN should consider a method of providing gross noble gas, iodine, and particulate release rates to the NRC. THE EQUIVALENT RELEASE RATES VALUES CALCULATED BY HBRDOSE SHOULD NOT BE REPORTED TO THE NRC.
Source term based on EMT samples	Yes	Yes	HBRDOSE uses gross (cpm or mrem/hr) inputs. RASCAL requires isotopic analysis.	NRC results will not be available for several hours, but may be more accurate.
Intermediate Phase Calculations	Yes	Yes	The FMDose module in RASCAL 3.01 computes doses, derived intervention levels (DILs), and emergency worker turn-back guidance for identified measurement locations.	NONE

Note 1: Dose factors for thyroid are identical between the two models. For external dose, RASCAL includes the contribution of short lived daughters in the external dose factors, which EPA-400 does not do. Similarly, RASCAL includes short lived daughter products in the inhalation and ground exposure dose factors. The most obvious result of this is that some of the noble gases (i.e. Kr-88), are included in inhalation and ground exposure dose in RASCAL. Ground exposure dose factors are calculated in RASCAL assuming a 0.3 cm/s deposition rate and further correction factor of 0.5 to account for rough ground. EPA-400 dose factors assume a deposition velocity of 1 cm/s for iodines and 0.1 cm/s for particulates with no correction factor.

MANUAL CALCULATION OF CURIES RELEASED (FOR DOSE PROJECTION TEAM USE)

Use this manual calculation for stability classes E, F, and G in MIXED MODE RELEASES when X/Q is extremely small at the site boundary when compared with the other X/Q values.

The Xenon Dose Equivalent and the Iodine Dose Equivalent are the source term values used by South Carolina Department of Health and Environmental Control for input into their dose assessment program.

Use the following formula, and the data from the most reasonable distance, to calculate **Q** in Curies.

$$\mathbf{Q} = [3600(\mathbf{D})] / [(1000)(X/\mathbf{Q})(\mathbf{DCF})]$$

where:

Q = the calculated Dose Equivalent source term in Curies,
3600 converts the release from Ci/sec to Curies
1000 = millirem - rem conversion
D = TEDE or thyroid CDE in mRem, both from the dose projection program printout,
X/Q = the dispersion factor (from the same distance as the dose, **D**),
DCF = the dose conversion factor (Rem per uCi - cm^{-3} - hr); 20 for Xenon dose equivalent **or** 1.3 E +06 for Iodine dose equivalent.

$$\mathbf{Q} = [3600(\mathbf{D})] / [(1000)(X/\mathbf{Q})(\mathbf{DCF})]$$
$$\mathbf{Q} = [3.6(\mathbf{D})] / [(X/\mathbf{Q})(\mathbf{DCF})]$$

Q(Xe) = [3.6( )] /[( )(20)] = Curies Xe-133 Dose Equivalent

Q(I) = [3.6( )] / [( ) (1.3E+06)] = Curies Iodine Dose Equivalent