



H. B. Barron
Vice President

Duke Energy Corporation

McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-9340
(704) 875-4800 OFFICE
(704) 875-4809 FAX

March 30, 2000

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

Re: McGuire Nuclear Station Unit 1 Docket No. 50-369
McGuire Nuclear Station Unit 2 Docket No. 50-370
Changes to Emergency Plan Implementing Procedures

Attached to this letter are a revised Emergency Plan Implementing Procedure (EPIP) Index and a number of revised Emergency Plan Implementing Procedures. These procedure changes were evaluated pursuant to the requirements of 10 CFR 50.54 (q). These changes do not constitute a reduction in the effectiveness of the emergency plan and continue to meet the requirements of 10 CFR 50.47 (b) and 10 CFR 50.54 Appendix E. As such, these changes do not require NRC approval prior to implementation. Revision bars in each individual procedure indicate the procedure changes. The following index and procedure changes have been implemented:

EPIP Index Page 1	RP/0/B/5700/023
EPIP Index Page 2	SH/0/B/2005/001
EPIP Index Page 3	

There are no new regulatory commitments in this document. Duke is also supplying two copies of this submittal to the Regional Administrator of Region II. Questions on this document should be directed to Steve Mooneyhan at (704) 875-4646.

Very truly yours,

H. B. Barron
Vice President, McGuire Nuclear Station
Duke Energy Corporation

HBB:jcm

Attachments

A045

U.S. Nuclear Regulatory Commission
March 30, 2000
Page 2

xc: (w/attachment)
Mr. Luis Reyes,
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

(w/o attachment)
NRC Resident Inspector

Frank Rinaldi, USNRC

Lee Keller (EC050)

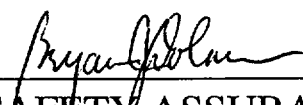
Electronic Licensing Library (EC050)

EP File 111

DUKE

McGUIRE NUCLEAR SITE

EMERGENCY PLAN IMPLEMENTING PROCEDURES

APPROVED: 
SAFETY ASSURANCE MANAGER

DATE APPROVED 3/20/00

EPIP Index Page 1
EPIP Index Page 2
EPIP Index Page 3
RP/0/B/5700/023
SH/0/B/2005/001

Dated 03/20/2000
Dated 03/20/2000
Dated 03/20/2000
Dated 03/20/2000
Issued 03/16/2000

EMERGENCY PLAN IMPLEMENTING PROCEDURES INDEX

<u>PROCEDURE #</u>	<u>TITLE</u>	<u>REVISION NUMBER</u>
RP/0/A/5700/000	Classification of Emergency	Rev. 004
RP/0/A/5700/001	Notification of Unusual Event	Rev. 012
RP/0/A/5700/002	Alert	Rev. 012
RP/0/A/5700/003	Site Area Emergency	Rev. 012
RP/0/A/5700/004	General Emergency	Rev. 012
RP/0/A/5700/05	Care and Transportation of Contaminated Injured Individual(s) From Site to Offsite Medical Facility	DELETE
RP/0/A/5700/006	Natural Disasters	Rev. 005
RP/0/A/5700/007	Earthquake	Rev. 006
RP/0/A/5700/008	Release of Toxic or Flammable Gases	Rev. 003
RP/0/A/5700/09	Collisions/Explosions	Rev. 000
RP/0/A/5700/010	NRC Immediate Notification Requirements	Rev. 010
RP/0/A/5700/011	Conducting a Site Assembly, Site Evacuation or Containment Evacuation	Rev. 005
RP/0/A/5700/012	Activation of the Technical Support Center (TSC)	Rev. 017
RP/0/A/5700/013	Activation of the Emergency Operations Facility (EOF)	DELETE
RP/0/A/5700/14	Emergency Telephone Directory	DELETE
RP/0/A/5700/015	Notifications to the State and Counties from the EOF	Rev. 008
RP/0/A/5700/16	EOF Commodities and Facilities Procedure	DELETE
RP/0/A/5700/17	Emergency Data Transmittal System Access	DELETE
RP/0/A/5700/018	Notifications to the State and Counties from the TSC	Rev. 005
RP/0/A/5700/019	Core Damage Assessment	Rev. 003
RP/0/A/5700/020	Activation of the Operations Support Center (OSC)	Rev. 010
RP/0/A/5700/21	EOF Access Control	DELETE
RP/0/A/5700/022	Spill Response Procedure	Rev. 009
RP/0/A/5700/024	Recovery and Reentry Procedure	Rev. 001
RP/0/A/5700/026	Operations/Engineering Technical Evaluations in the Technical Support Center (TSC)	Rev. 001
RP/0/B/5700/023	Community Relations Emergency Response Plan	Rev. 001
OP/0/B/6200/090	PALSS Operation for Accident Sampling	Rev. 010

EMERGENCY PLAN IMPLEMENTING PROCEDURES INDEX

<u>PROCEDURE #</u>	<u>TITLE</u>	<u>REVISION NUMBER</u>
HP/0/B/1009/002	Alternative Method for Determining Dose Rate Within the Reactor Building	Rev. 002
HP/0/B/1009/003	Recovery Plan	Rev. 002
HP/0/B/1009/05	Initial Evaluation of Protective Action Guides Due to Abnormal Plant Conditions	DELETED
HP/0/B/1009/006	Procedure for Quantifying High Level Radioactivity Releases During Accident Conditions	Rev. 004
HP/0/B/1009/010	Releases of Radioactive Effluents Exceeding Selected Licensee Commitments	Rev. 005
HP/1/B/1009/015	Unit 1 Nuclear Post-Accident Containment Air Sampling System Operating Procedure	Rev. 003
HP/2/B/1009/015	Unit 2 Nuclear Post-Accident Containment Air Sampling System Operating Procedure	Rev. 003
HP/0/B/1009/016	Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release	Rev. 001
HP/0/B/1009/020	Manual Procedure for Offsite Dose Projections	DELETED
HP/0/B/1009/021	Estimating Food Chain Doses Under Post-Accident Conditions	Rev. 001
HP/0/B/1009/022	Accident and Emergency Response	Rev. 002
HP/0/B/1009/023	Environmental Monitoring for Emergency Conditions	Rev. 002
HP/0/B/1009/024	Personnel Monitoring for Emergency Conditions	Rev. 001
HP/0/B/1009/029	Initial Response On-Shift Dose Assessment	Rev. 004
SH/0/B/2005/001	Emergency Response Offsite Dose Projections	Rev. 001
SH/0/B/2005/002	Protocol for the Field Monitoring Coordinator During Emergency Conditions	Rev. 000
SR/0/B/2000/01	Standard Procedure for Public Affairs Response to the Emergency Operations Facility	Rev. 001
SR/0/B/2000/002	Standard Procedure for EOF Commodities and Facilities	Rev. 001
SR/0/B/2000/003	Activation of the Emergency Operations Facility	Rev. 003

EMERGENCY PLAN IMPLEMENTING PROCEDURES INDEX

<u>PROCEDURE #</u>	<u>TITLE</u>	<u>REVISION NUMBER</u>
McGuire Site Directive 280	Site Assembly/Accountability and Evacuation/Containment Evacuation	DELETED
EP Group Manual	Section 1.1 Emergency Organization	Rev. 017
MNS RP Manual:	Section 18.1 Accident and Emergency Response	DELETED
	Section 18.2 Environmental Monitoring for Emergency Conditions	DELETED
	Section 18.3 Personnel Monitoring for Emergency Conditions	DELETED
	Section 18.4 Planned Emergency Exposure	DELETED

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. RP/O/B/5700/023

Revision No. 001

PREPARATION

(2) Station **McGuire Nuclear Station**(3) Procedure Title **Community Relations Emergency Response Plan**(4) Prepared By *J. M. R. [Signature]* Date 3/7/00

(5) Requires 10CFR50.59 evaluation?

☒ Yes (New procedure or revision with major changes)☐ No (Revision with minor changes)☐ No (To incorporate previously approved changes)(6) Reviewed By *J. M. R. [Signature]* (QR) Date 3/8/2000Cross-Disciplinary Review By _____ (QR) NA *J. M. R. [Signature]* Date 3/8/2000Reactivity Mgmt. Review By _____ (QR) NA *J. M. R. [Signature]* Date 3/8/2000

(7) Additional Reviews

Reviewed By *Samuel C. [Signature]* Date 3/9/2000

Reviewed By _____ Date _____

(8) Temporary Approval (if necessary)

By _____ (SRO/QR) Date _____

By _____ (QR) Date _____

(9) Approved By *[Signature]* Date 3/20/00**PERFORMANCE** (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification

☐ Yes ☐ N/A Check lists and/or blanks initialed, signed, dated or filled in NA, as appropriate?☐ Yes ☐ N/A Listed enclosures attached?☐ Yes ☐ N/A Data sheets attached, completed, dated and signed?☐ Yes ☐ N/A Charts, graphs, etc. attached, dated, identified, and marked?☐ Yes ☐ N/A Procedure requirements met?

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

(14) Remarks (attach additional pages, if necessary)

Duke Power Company McGuire Nuclear Station Community Relations Emergency Response Plan Reference Use	Procedure No. RP/0/B/5700/023
	Revision No. 001
	Electronic Reference No. MP00706T

Community Relations Emergency Response Plan

1. SYMPTOMS

Conditions exist such that the Public Affairs Organization has been activated. The EnergyExplorium can be staffed at the discretion of the Community Relations Manager. In all cases, the Community Relations emergency response plan will be activated at an Alert or higher emergency classification.

2. IMMEDIATE ACTIONS

2.1 Community Relations emergency response plan activation during normal working hours:

2.1.1 Community Relations Manager/designee will serve as the Onsite News Manager.

2.1.2 The nuclear site Vice President/alternate will serve as the Onsite Public Spokesperson.

2.1.3 Community Relations Manager/designee will determine staffing for the EnergyExplorium during emergency conditions.

2.2 Community Relations emergency response plan activation after hours, holidays and weekends:

2.2.1 The Community Relations duty person is responsible for the following:

- Emergency planning pager
- Fitness for duty during rotation
- Contacting Community Relations Manager/designee
- Reporting to EnergyExplorium

2.2.2 The Community Relations Manager/designee will determine staffing of the EnergyExplorium and activate the call trees as necessary.

3. SUBSEQUENT ACTIONS

Respond as required by enclosures designated for the individual position.

4. ENCLOSURES

- 4.1 Onsite News Manager
- 4.2 Onsite Public Spokesperson
- 4.3 McGuire Community Relations Duty Person
- 4.4 McGuire Community Relations Staff
- 4.5 Procedure for Accessing Forms
- 4.6 Procedure for Accessing Data Information Forms
- 4.7 Procedure for Accessing News Releases

**ONSITE NEWS MANAGER
ACTIVATION CHECKLIST**

Initial

- _____ **SIGN** staffing sheet.
- _____ **PUT** on position badge.
- _____ **REVIEW** contents of the Emergency Notification message form.
- _____ **DETERMINE** if Media Relations duty person has been provided the Emergency Notification Form.
- _____ **DETERMINE** if contact with the EOF Technical Liaison has been made.
- _____ **DETERMINE** staffing requirements and call-ins.

NOTE: Telephone numbers for the EOF and JIC are included in the Joint Information Center telephone directory located in the emergency file drawer.

- _____ **CALL** the Public Information Manager at the JIC to request another spokesperson if the Site Vice President is known to be unavailable, or hasn't reported within 75 minutes.
- _____ **REQUEST** additional resources, if needed, from the Public Information Manager.
- _____ **SERVE** as Company Spokesperson for media exchanges until relieved by the Onsite Public Spokesperson/alternate.

NOTE: Enclosures 4.5 and 4.6 provide instructions for accessing forms and data information forms.

- _____ **ASSIST** Onsite Public Spokesperson in preparing for media interviews by providing the following:
 - Copies of all approved talking points and rumor information
 - Copies of all news releases
 - Copies of emergency notification forms
 - Completed media interview form
- _____ **SERVE** as moderator for stand-up interview if media are present.
- _____ **ACCESS** EOF Bridge to resolve rumors identified during media briefings and interviews.
- _____ **DOCUMENT** all decision making, phone calls and key contacts on log sheets.

**ONSITE PUBLIC SPOKESPERSON
ACTIVATION CHECKLIST**

Initial

- _____ **SIGN** staffing sheet.
- _____ **PUT** on position badge.
- _____ **REVIEW** the Emergency Notification message.

NOTE: See "Telephone Numbers" folder in the emergency file drawer for bridge and TSC phone numbers.

- _____ **ACCESS** the EOF Bridge to obtain current information if the Onsite News Manager is not available.
- _____ **WORK** with News Manager to complete media interview form.

CAUTION: Any reference to dose is to be based on actual dose at the site boundary.

- _____ **MONITOR** plant status, radiological information and other information via the TSC and EOF bridge lines.
- _____ **REVIEW** media interview forms, all approved statements, news releases and escalated rumor information prior to each stand-up interview. Carry information to each stand-up interview.
- _____ **ADDRESS** significant rumors about plant status and/or any misinformation revealed by media questions during stand-up interview.
- _____ **DOCUMENT** decision making, phone calls and key contacts on log sheets.

Enclosure 4.3
McGUIRE COMMUNITY RELATIONS
DUTY PERSON

RP/0/B/5700/023
Page 1 of 1

ACTIVATION CHECKLIST

Initial

- _____ **SIGN** staffing sheet.
- _____ **PUT** on position badge.
- _____ **CONTACT** Community Relations Manager and confirm their response to the Center.
- _____ **SERVE** as Onsite News Manager until Community Relations Manager arrives.
- _____ **SERVE** as Onsite News Manager if the Community Relations Manager is not available.

NOTE: JIC bridge numbers are shown in the Joint Information Center telephone directory located in the emergency file drawer.

- _____ **CONTACT** the Public Information Manager in JIC to request a back-up Onsite News Manager, if Community Relations manager is unavailable.
- _____ **NOTIFY** Media Relations Duty person on status of Onsite News Manager's response.
- _____ **ENSURE** all bridge lines are connected and the Technical Support Center (TSC) phone is on mute.

NOTE: The emergency planner bridge is to be used for clarifying information on emergency notification forms (ENFs) to ensure accuracy prior to stand-ups and news release approvals.

- _____ **ENSURE** bridge line is established with the TSC emergency planner via headset.
- _____ **CHECK** FAX machine for copy of emergency notification form.
- _____ **DETERMINE** 24-hour staffing requirements.
- _____ **ASSIGN** EnergyExplorium activation activities to available staff.
- _____ **DISPATCH** a staff person to the Technical Support Center if it becomes difficult to get information about the event from the TSC Offsite Communicator or Emergency Planner.
- _____ **ENSURE** status board is updated as needed.

**McGUIRE COMMUNITY
RELATIONS STAFF****ACTIVATION CHECKLIST**

Initial

- _____ **SIGN** staffing sheet.
- _____ **PUT** on position badge.
- _____ **PREPARE** EnergyExplorium upstairs as staff work area.

NOTE: Bridge numbers are located in the Joint Information Center telephone directory in the emergency file drawer.

- _____ **ACCESS** appropriate links using bridge lines.
- _____ **CALL** Industrial Security or Commodities and Facilities duty person to have building alarm disarmed, if necessary.

NOTE: Ensure both Site and Industrial Security understand that any media they come in contact with is to be directed and/or escorted to the EnergyExplorium.

- _____ **EVALUATE** the need to contact Site Security and **REQUEST** Industrial Security place barricades and signage directing media to the EnergyExplorium.

CAUTION: EPZ diagram and Reception Center Location charts are to be used only by State of North Carolina or EPZ county officials if present.

- _____ **SET** up auditorium for stand-up interviews. This includes:
 - microphone
 - podium
 - white board and markers
 - plant schematic (slide, Powerpoint or framed copy)
 - EPZ diagram and chart stands (have available, but not set up)
 - Reception Center Locations chart (have available, but not set up)
- _____ **LOOK** at EnergyExplorium calendar and evaluate rescheduling groups.
- _____ **ASSEMBLE** the following information (to be used in media kits, if requested):
 - McGuire Emergency Planning calendar
 - McGuire Brochure
 - Schematic Fact Sheet

**McGUIRE COMMUNITY
RELATIONS STAFF**

ACTIVATION CHECKLIST

CAUTION: Do not allow media to enter EnergyExplorium office area.

- _____ **ASSIGN** staff members to greet and log in media, and provide visitor badges and media kits.
- _____ **ASSIST** with media upon arrival.
- _____ **INFORM** Regional Communications Coordinator when the EnergyExplorium is activated and available for media.

NOTE: Instructions for accessing forms and data information forms are shown as enclosures 4.5 and 4.6. These forms are also available as hard copies in the emergency file drawer.

- _____ **OBTAIN** data information forms and forms from the JIC drive.

NOTE: Instructions for forwarding phones to the Customer Service center are located in the emergency file drawer.

- _____ **DETERMINE** when, or if, EnergyExplorium public telephone lines should be forwarded to the Customer Service Center.

NOTE: Onsite News Manager and the Public Spokesperson will relocate to the EOF or JIC (as needed) once the need to evacuate the Onsite Media Center/EnergyExplorium is determined.

- _____ **BE PREPARED** to leave the Onsite Media Center/EnergyExplorium should plant conditions require personnel to be evacuated.

Enclosure 4.5
REFERENCE FOR
ACCESSING FORMS

RP/0/B/5700/023
Page 1 of 1

LOG on computer

DOUBLE-CLICK JIC drive (icon)

DOUBLE-CLICK on "Forms" under directories

NOTE: A backup diskette containing the Community Relations procedure, news release templates, data information templates, and tip sheets is located in the procedure folder.

CLICK on the form you wish to view

- News Conference Form (newconf.doc)
- Agenda for News Conference (agenda.doc)

PRINT form by clicking print icon

Enclosure 4.6
REFERENCE FOR ACCESSING
DATA INFORMATION FORMS

RP/0/B/5700/023
Page 1 of 1

TURN on computer

DOUBLE-CLICK JIC drive (icon)

DOUBLE-CLICK on the Data Info folder

SELECT the file you wish to read

PRINT a copy of the forms (if needed) by clicking on the print icon

Enclosure 4.7
REFERENCE FOR
ACCESSING NEWS RELEASES

RP/0/B/5700/023
Page 1 of 1

TURN on computer

DOUBLE-CLICK JIC drive (icon)

DOUBLE-CLICK on the appropriate nuclear site (cns, mns, ons) in the directories section

DOUBLE-CLICK on "newsrele" under directories

CLICK on "drill" or "emer"

NOTE: News releases are read only and cannot be changed by the reader.

CLICK on the news release you want to view (e.g., nr1, nr2, nr3, etc.)

PRINT a copy of the news release by clicking on the print icon

Duke Power Company
**PROCEDURE PROCESS RECORD
 FOR STANDARD PROCEDURES**

(1) ID No. SH/O/B/2005/001Revision No. 001**PREPARATION**(2) Procedure Title: Emergency Response Offsite Dose Projections(3) Prepared By Duham T Johnson Date 2-1-00

(4)	Applicable To:	☐ ONS	☒ MNS	☒ CNS
(5)	Technical Advisor	<u>Gary J. Durrell</u>		<u>W. J. Fanning</u>
(6)	Requires 10CFR50.59 Evaluation?	☐ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No
		YES = New procedure or revision with major changes at applicable site NO = Revision with minor changes NO = To incorporate previously approved changes		
(7)	Review (QR)	By _____ Date _____	By <u>Gary J. Durrell</u> Date <u>2/23/00</u>	By <u>W. J. Fanning</u> Date <u>2/28/2000</u>
	Cross-Disciplinary Review (QR)	By _____ NA _____ Date _____	By _____ NA <u>gr</u> Date <u>3/1/00</u>	By <u>Gary L. Mitchell</u> NA _____ Date <u>2/21/2000</u>
	Reactivity Mgmt. Review (QR)	By _____ NA _____ Date _____	By _____ NA <u>gr</u> Date <u>3/1/00</u>	By <u>GLM</u> Date <u>2/21/2000</u>
(8)	Additional Reviews	By _____ Date _____ By _____ Date _____	By <u>K. L. Murray</u> Date <u>3-1-00</u> By <u>J. J. Muehlen</u> Date <u>3/8/2000</u>	By _____ Date _____ By _____ Date _____
(9)	Approved	By _____ Date _____	By <u>William T. Byrum</u> Date <u>3/8/2000</u>	By <u>Michael J. Byrum</u> Date <u>2/29/00</u>
(10)	Use Level	Reference Use		

PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

(11) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(12) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(13) Procedure Completion Verification

☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?☐ Yes ☐ NA Listed enclosures attached?☐ Yes ☐ NA Data sheets attached, completed, dated, and signed?☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(14) Procedure Completion Approved _____ Date _____

(15) Remarks (Attach additional pages, if necessary.)

Duke Power Company Catawba and McGuire Nuclear Stations Emergency Response Offsite Dose Projections Reference Use	Procedure No. SH/0/B/2005/001
	Revision No. 001
	Electronic Reference No. MP0070PF

Emergency Response Offsite Dose Projections

1. Purpose

To provide instruction to Emergency Response Organization (ERO) dose assessors for determining source term and calculating the projected offsite dose to the public using Raddose 5 (Earth Tech TM Windows© based computer program); and to provide dose assessment guidance for completion of Emergency Notification form.

NOTE: This procedure is an Emergency Plan Implementing Procedure (EPIP) to be used for Catawba and McGuire Nuclear Stations. Emergency Planning must be notified of any changes to this procedure.

2. References

- 2.1 Earth Tech Raddose 5 Operator's Manual, Detailed Design Manual, System Design Specification, Verification and Validation Report Vol 1 and 2
- 2.2 Station specific procedures for alternate method of determining Reactor Building dose rate:

CNS - HP/0/B/1009/006	Alternative Method for Determining Dose Rate Within the Reactor Building
MNS - HP/0/B/1009/002	Alternative Method for Determining Dose Rate Within the Reactor Building
- 2.3 Station specific procedures for post accident gas sampling:

CNS - HP/0/B/1009/017	Post Accident Containment Air Sampling System
MNS - HP/1/B/1009/015 (Unit 1)	Nuclear Post-Accident Containment Air Sampling System Operating Procedure
MNS - HP/2/B/1009/015 (Unit 2)	Nuclear-Post Accident Containment Air Sampling System
- 2.4 Station specific procedure for abnormal unit vent sampling:

CNS - HP/0/B/1009/021	Abnormal Unit Vent Sampling
MNS - HP/0/B/1009/006	Procedure for Quantifying High Level Radioactivity Releases During Accident Conditions

- 2.5 EPA 400-R-92-001 Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
- 2.6 Letter from F.G. Hudson, September 20, 1985, Re: Release Rate Information for McGuire and Catawba Nuclear Stations (File: GS-750.25, NUC-0306)
- 2.7 Letter from H.B. Tucker, November 30, 1989, Re: Follow-up on McGuire Alert (March 7 - 8, 1989) Critique Action Items
- 2.8 U.S. Nuclear Regulatory Commission Response Technical Manual (RTM-93)
- 2.9 Station specific procedures for classification of emergencies:
 - CNS - RP/0/A/5000/001 Classification of Emergency
 - MNS - RP/0/A/5700/000 Classification of Emergency

3. Limits and Precautions

- 3.1 Use this procedure during abnormal or emergency conditions (including exercises and drills).
- 3.2 This procedure may be performed in sections or parts, using steps in any sequential order, to evaluate and/or assess offsite radiological conditions.
- 3.3 Verify all data, both automatic and manual, prior to using in dose assessments.

4. Procedure

- 4.1 Use Raddose 5 program to calculate Total Effective Dose Equivalent (TEDE) exposure, Committed Dose Equivalent (CDE) Thyroid exposure, and Effective Dose Equivalent (EDE) exposure in ten mile Emergency Planning Zone (EPZ).
 - Provide information for offsite dose exposure and projected offsite dose rate results, from any radioactive material(s) released offsite, to ERO Management.
- 4.2 Access the Raddose 5 software.
 - 4.2.1 Click on the Raddose 5 icon.
 - 4.2.2 A dialog box will appear stating the "DAS Workstation configuration" (EOF or TSC). Click on "OK" to access the DAS (Dose Assessment Software) Desktop.

4.2.3 Change the DAS configuration if needed as follows:

- At the DAS Desktop, click on **FILE**.
- Click on **DAS Configuration**.
- Click on appropriate Work Station Type (EOF or TSC) and Mode (Production or Training).
- Restart Raddose 5 for changes to take affect.

4.2.4 Select the appropriate Station and Unit from the DAS Desktop.

4.2.5 Select **Accident mode** or **Drill mode** appropriate to ERO response.

- Select **Automatic** mode for program query or fifteen minute average data from Operator Aided Computer (OAC).
- Select **Manual** for keyboard entry of data.

NOTE: Use option **Begin New Incident** for initial program operation; or the option **Continue Previous Incident** may be selected for continuation of a program using previously entered data with previous dose assessment calculations.

4.2.6 Select **Begin New Incident** and enter information (e.g., reactor trip date, reactor trip time, release date and release time); or proceed to Step 4.2.7 if previous dose assessment files are to be used.

- **IF** the reactor did not trip, and shutdown is in progress, **THEN** use current time in the blank for reactor trip time.
- Release time (estimated or known).
- Enter operator initials and use the mouse to accept and/or cancel.

NOTE: Option **Continue Previous Incident** may be selected where previously calculated data files from local computer hard drive and a local server are used; or the option **Network Data** may be selected to continue using network files from either Technical Support Center (TSC) or Emergency Operations Facility (EOF) server.

4.2.7 Select **Continue Previous Incident** if previous TSC or EOF files are valid.

- Select **Local Data** to access and write results to local hard drive and server.
- Select **Network Data** which provides pop up message and overwrites local drive with dose assessment files transferred from **TSC** or **EOF**.
- Use single mouse click for **OK** or **Cancel**.

4.3 Select **Enter/Edit Meteorological Data** from program selection and input data for current meteorological conditions.

NOTE: Use actual site meteorology for assessment of a release, until it is appropriate to use forecasted data provided by a meteorologist. **IF** site meteorology cannot be obtained from meteorological tower systems, refer to Enclosure 5.1 (Meteorology).

4.3.1 Enter meteorological data, or **Requery** for automatic meteorological input.

4.3.1.1 If manual meteorological data entries are required use Enclosure 5.1 (Meteorology) as necessary.

- Enter wind speed in miles per hour (mph).
- Enter wind direction; where wind direction is from **North** ($N=0^{\circ}$).
- Enter Delta temperature gradient (ΔT) in degrees centigrade ($\Delta T = C^{\circ}$).
- Enter air temperature in degrees centigrade (Temperature in C°).
- Enter precipitation occurring (inches per fifteen minute period).
- Mean mixing height (in meters) is computer calculated using ΔT and air temperature.
- Manually overwrite meteorological data or **Requery** for data that is acceptable.

- Refer to Enclosure 5.2 (Protective Action Zones Determination Table) for determination of affected downwind Protective Action Zones (PAZs).

4.3.2 Follow menu options; **Accept** data, by single mouse click for computer calculations of meteorological data; or **Requery** for automatic OAC data; or **Add Time Step** for additional time of release; or **Cancel** entry.

4.4 Select **Enter/Edit Source Term Data** for accident type selection and input of source term data for a time step and release path(s).

4.4.1 Select accident type and corresponding noble gas monitor (NG method) for each selected path in a time step.

NOTE: Consult with ERO personnel (e.g., TSC Operations Engineering and/or EOF Accident Assessment) prior to using “gap release” or “core melt” accident types.
--

- LOCA - Loss of coolant (normal coolant) - leaks released into containment with those fission products normally found in coolant.
- LOCAG - Loss of coolant gap release - coolant leaks into containment of fission products in the fuel pin gap after fuel cladding has failed (e.g., core being uncovered, fuel pin heat up, and/or if mechanical fuel pin damage has occurred).
- LOCAM - Loss of coolant core melt - coolant leaks released into containment of fission products expected to be released from a core that is partially melted after being uncovered for some period of time.
- SGTR - Steam generator tube rupture (normal coolant) - steam generator release accidents with those fission products normally found in coolant.
- SGTRG - Steam generator tube rupture gap release - steam generator tube release accidents that release fission products in the fuel pin gap after fuel cladding has failed (e.g., core uncover or fuel pin heat up and/or after mechanical fuel pin damage has occurred).
- SGTRM - Steam generator tube rupture core melt - steam generator tube release accidents that release fission products expected to be released from a core that is partially melted after being uncovered for some period of time.

- LOCO - LOCA outside containment (normal coolant) - leaks released directly from containment to outside environment (e.g., Annulus or Auxiliary Building) with fission products normally found in reactor coolant.
- LOCOG - LOCA outside containment gap release - leaks released directly from containment to outside environment (e.g., Annulus or Auxiliary Building) with fission products in the fuel pin gap after fuel cladding has failed (e.g., core uncover or fuel pin heat up and/or after mechanical fuel pin damage has occurred).
- LOCOM - LOCA outside containment core melt - leaks released directly from containment to outside environment (e.g., Annulus or Auxiliary Building) with fission products expected to be released from a core that is partially melted after being uncovered for some period of time.
- FUEL - Fuel handling gap release - fuel pin fission products released from fuel during refueling, or Spent Fuel Pool accident.

NOTE: Use consistent **Accident Type** and identify release path(s) for each fifteen minute time step; changing Accident Type only when reactor and/or plant status indicate conditions degrading to a different accident.

- 4.4.2 Use Enclosure 5.3 (Steam Source Term Release) and Raddose 5 for assessment of steamline power operated relief valve release, or steam line break accident.
- 4.4.3 Use Enclosure 5.4 (Containment Source Term Release) and Raddose 5 for assessment of a containment accident release.
- 4.4.4 Use Enclosure 5.5 (Unit Vent Source Term Release) and Raddose 5 for assessment of a unit vent release.
- 4.4.5 Enter **Monitor Reading**, re-query OAC data, or manually edit EMF monitor values, used for source term calculations in each identified accident release pathway.
 - Normally OAC fifteen minute average readings are used for source term calculations; however, live time monitor readings are acceptable whenever queried data is suspect or user is manually entering data.
- 4.4.6 Follow menu options to **Accept** data, by single mouse click for computer calculations of source term data; or **Requery** for automatic OAC data; or **Add Time Step** for additional time of release; or **Cancel** entry.

4.5 **Select Emergency Classification** from the Raddose 5 main menu.

NOTE: This menu item is used to select the **Current** Emergency Classification in a drill or accident. DO NOT select a classification based on radiological conditions only.

4.5.1 Select the current Emergency Classification (Unusual Event, Alert, site Area Emergency, General Emergency) from the menu.

4.6 Select **Perform Calculations** to calculate **Real Time Mode** dose results displayed on ten mile map with Maximum Dose Rates and selectable receptor point display

4.6.1 Select **Continue** from map display to return to **Real Time Mode Output Menu**.

4.6.2 Select **Continue Calculations** if forecasted doses and an Emergency Notification Form is needed at this time. Other menu items may be selected as follows:

- **Display Grid Receptor Doses** is used to go to the *real-time* Grid Point Receptor Menu.
- **Display Plume Arrival Times** is used to display *real-time* plume arrival times.
- **Display 2-Mile Map** is used to see *real-time* Plume EDE and Adult Thyroid dose rates within two miles of the site.
- **Display 10-Mile Map** is used to see *real-time* Plume EDE and Adult Thyroid dose rates within ten miles of the site.
- **Display Survey Point Receptors** is used to see *real-time* dose rates and accumulated doses for predetermined sample points.
- **Display Point-of-Interest Doses** is used to see *real-time* dose rates at any point of interest. This choice may be used to display dose rates beyond the 10-mile radius of the site.
- **Display 50-Mile Deposition Data** is used to go to the *real-time* 50-mile deposition menu.
- **Go To Report Menu** is used if output of *real-time* is desired.

- 4.7 Select **Perform Forecast** to calculate TEDE and CDE dose rates (mrem/hr), and accumulated dose (mrem), for the release duration in **Forecast Mode**; based on predicted accident stop time or release termination.
- 4.7.1 Select the appropriate Emergency Release Status (e.g., None, Potential, Is Occurring, Has Occurred).
- 4.7.2 Select the appropriate Status of Projected Offsite Dose (e.g., New or Unchanged).
- 4.7.3 Enter a Forecast Period (in hours).
- 0.5 hours is the lower limit allowed as a forecast period.
- 4.7.4 **Forecast mode** doses are calculated using the most current time step and are displayed on ten mile EPZ map.
- 4.7.5 Select **GE PARs** to display the General Emergency Protective Action Recommendations. This option is only available if a General Emergency is selected.
- 4.7.6 Select **Continue** from map display with pop up menu item for selection **Yes** or **No**, to save Forecasted dose in PAZs for determining evacuation.
- 4.7.7 Select **Go To Report Menu** to go to the Forecast Mode Report Options Menu and access the Raddose 5 Emergency Notification Form.

NOTE: Refer to Step 4.5.2 for a description of the other choices on this menu. However, in forecast mode, the choices will display *forecasted* results instead of *real-time* results.

- 4.7.8 Select **Print Emerg Notification, Summary Report** to print the Emergency Notification Form (green sheet) and the Summary Report. Other menu items may be selected as follows:
- **Display/Edit Green Form** is used to display the Emergency Notification Form and to make changes as needed.
 - **Save Green Form Data to Ini File** is used to automatically transfer the Raddose 5 data to a storage file that can be accessed by the Electronic Notification Form.
 - **Return to Output Menu** is used when done with Forecast Mode reports.

- 4.7.9 Select **Return to Output Menu** and then select **Continue Calculations** to return to the main menu in *real-time* mode.
- 4.8 Compare forecasted doses on the Emergency Notification Form to the Protective Action Guide (PAG) limits as follows:
- 4.8.1 The affected Protective Action Zones (PAZs) are determined by the wind speed and wind direction.

NOTE: The projected TEDE and Thyroid CDE on the Emergency Notification form is calculated by adding the forecasted dose to the accumulated real-time dose.

- 4.8.2 Recommend **no protective action** if EPZ projected dose for PAZs is < 1 rem TEDE or < 5 rem Adult Thyroid CDE.
- 4.8.3 Recommend **evacuation** of the affected PAZs if the projected dose is ≥ 1 rem TEDE or ≥ 5 rem Adult Thyroid CDE; and recommend **shelter in place** for all other PAZs.

CAUTION: Whenever a PAZ has been added to a list of affected zones, the PAZ should not be removed except under direction of Radiological Assessment Manager.

- Recheck meteorological and radiological conditions, as practical to further include any affected sectors or PAZs that may be added.

- 4.9 Refer to Enclosure 5.6 (Radiological Emergency Action Levels) and evaluate the Emergency Action Levels (EALs) based on radiological conditions.
- 4.9.1 Provide EAL radiological assessment classifications to ERO Management in the TSC and/or EOF.
- 4.10 Raddose 5 calculates Effective Dose Equivalent (EDE) exposure and provides Self Reading Dosimeter (SRD) correction factor (SRD_{CF}), that can be obtained by printing **Summary Report** after **Perform Calculations** in **Real-Time** mode.

$$\text{SRD}_{\text{CF}} = \frac{\text{TEDE}}{\text{EDE}}$$

SRD_{CF} = SRD correction factor

TEDE = Total Effective Dose Equivalent

EDE = Effective Dose Equivalent

NOTE: The SRD_{CF} value is based on accident specific source term nuclide(s) and is a calculation of TEDE to EDE ratio at site boundary.

- SRD_{CF} is provided to offsite Emergency Workers during an accident, after a declared General Emergency, and when a release is occurring.
- SRD_{CF} is used as a multiplier of Emergency Worker SRD readings for EPA 400 Manual Of Protective Action Guides And Protective Actions For Nuclear Incidents, "Early Phase" Emergency Worker TEDE estimate.

4.11 Provide Radiological Assessment Manager (RAM), Lead TSC Dose Assessor and/or ERO personnel completing Emergency Notification form the following information for each of the following Emergency Notification line items:

4.11.1 Line # 1- Events status indicating status of notification

4.11.2 Line # 2- Site and Unit

4.11.3 Line # 7 - Emergency Description remarks applicable to radiological conditions

4.11.4 Line # 9 - Reactor Status (Reactor status used for computer entries)

4.11.5 Line # 10 - Emergency Release(s); use the following guidelines:

4.11.5.1 None - no release of radioactivity generated by the event and no release expected.

4.11.5.2 Potential Release - radioactivity generated during an event that has potential to be released but is not currently being released.

- Discretionary option for the Emergency Coordinator or the EOF Director.

4.11.5.3 Is Occurring - radioactivity generated during an event that is currently being released through any defined accident pathway, using any of the following indicators:

- Either containment particulate, gaseous, iodine monitor readings indicate an increase in activity,

OR

Containment monitor readings indicate greater than 1.5 R/hr,

AND

Either containment pressure is greater than 0.3 psig,

OR

An actual containment breach is known to exist.

- Unit vent particulate, gaseous, iodine monitor readings indicate an increase in activity.
- Condenser air ejector exhaust monitor or other alternate means indicate Steam Generator tube leakage.
- Confirmed activity in the environment reported by Field Monitoring Team(s).
- Knowledge of the event and the impact on systems operation and resultant release paths.

4.11.5.4 Has Occurred - any radioactivity generated during an event that has been released previous to ERO activation that may require offsite agency notification.

4.11.6 Line # 11 - Type of Release; check Ground Level release and record Airborne or Liquid release with start time and stop time; if known.

4.11.7 Line # 12 - Release Magnitude in Ci/Sec released.

4.11.7.1 Indicate **Normal Operating Limits** above or below site boundary limits where **Technical Specification site boundary** dose rate limit is; $<5.0E-2$ mrem/hr and/or Child Thyroid Dose limit is; $<1.711E-1$ mrem/hr, using the following guidelines.

- Release Below Normal Operating Limits is radioactivity released at any time during an event and/or radioactivity that may have been previously released that is not above site boundary normal operating limits.
- Release Above Normal Operating Limits is any radioactivity released during the event and/or any radioactivity previously released that is above normal site boundary operating limits.

4.11.7.2 Indicate each form of radioactive material released offsite.

- Noble gases
- Iodines
- Particulates
- Other

4.11.8 Line # 13 - Record Estimate of Projected Offsite Dose as New or Unchanged, and record projection time of Forecast.

- Include estimated duration of release (PRD_t) in hours, if release stop time or termination of release is determined.
- Record integrated TEDE and CDE mrem dose at Site Boundary, 2 miles, 5 miles and at 10 miles.

NOTE: IF the release is below normal operating limits, enter "Not Required" in the TEDE and CDE fields on the Emergency Notification Form.

4.11.9 Line #14 - Record meteorological data.

4.11.9.1 Wind Direction **from North** where N=0°

4.11.9.2 Wind Speed (miles per hour)

4.11.9.3 Stability Class

4.11.9.4 Precipitation (type)

4.11.10 Line #15 - Recommended PAZ protective actions are based on radiological Protective Action Guide (PAG) dose limits compared to projected dose calculations integrated with real time accumulated dose in affected PAZs.

- Provide recommendations as determined in Step 4.8.

4.12 ERO Emergency Action Level Classification.

4.12.1 Recommend Emergency Action Level (EAL) classification as determined in Step 4.9.

- 4.13 Provide Raddose 5 printouts and summary reports to Federal, State and County agencies supporting ERO activation, with approval by lead TSC dose Assessor or EOF RAM.
- 4.14 Retain logs, computer printouts and computer generated dose assessment files, whenever ERO is activated.
 - Exercise and Drill records are retained for Emergency Planning disposition.

5. Enclosure

- 5.1 Meteorology
- 5.2 Protective Action Zones Determination Table
- 5.3 Steam Source Term Release
- 5.4 Containment Source Term Release
- 5.5 Unit Vent Source Term Release
- 5.6 Radiological Emergency Action Levels
- 5.7 Raddose 5 Green Form

5.1.1 Meteorological Tower OAC data is normally provided as 15 min. average.

- Use lower tower wind speed (WS) in miles per hour
- Use upper tower wind speed (WS) if lower tower wind speed is not available
- Use upper tower wind direction; in degrees from North (N) = 0°
- Use lower tower wind direction if upper tower wind direction is not available: in degrees from North (N) = 0°

5.1.2 **IF** Meteorological Tower is not available, obtain meteorological information from:

- Duke meteorologist at 594-0341/0289
- Unaffected plants control room:
CNS - 831-2338/2337
MNS - 875 4262/4263
- National Weather Service (NWS) at 1-800-268-7785
- Gastonia Automated Surface Observation System (ASOS) at 704-868-9034

5.1.3 If meteorological tower temperature gradient (ΔT°) is unknown, use the following default values:

	CNS		MNS	
	Δt	Stability Class	Δt	Stability Class
Between 1000-1600 hours:	-0.3	D	-0.3	D
Between 1600-1000 hours:	+1.3	F	+1.3	F

5.1.4 Use the following tables to determine stability class when ΔT data is available:

Stability Class	<u>CNS</u>	<u>MNS</u>
	(ΔT in $^{\circ}\text{C}$)	(ΔT in $^{\circ}\text{C}$)
A - Extremely Unstable	$\Delta T \leq -0.97$	$\Delta T \leq -0.95$
B - Moderately Unstable	$-0.97 < \Delta T \leq -0.87$	$-0.95 < \Delta T \leq -0.86$
C - Slightly Unstable	$-0.87 < \Delta T \leq -0.76$	$-0.85 < \Delta T \leq -0.76$
D - Neutral	$-0.76 < \Delta T \leq -0.25$	$-0.75 < \Delta T \leq -0.26$
E - Slightly Stable	$-0.25 < \Delta T \leq +0.76$	$-0.25 < \Delta T \leq +0.74$
F - Moderately Stable	$+0.76 < \Delta T \leq +2.04$	$+0.75 < \Delta T \leq +2.00$
G - Extremely Stable	$+2.04 < \Delta T$	$+2.00 < \Delta T$

Protective Action Zones Determination Table

5.2.1 For **Catawba**, determine affected Emergency Planning Zone (EPZ) Protective Action Zones (PAZs) based on direction wind is blowing from (degrees from **North (N) = 0⁰**) and wind speed.

- For wind speed ≤ 5 mph, affected PAZs include all PAZs out to five miles;
A0,A1,B1,C1,D1,E1,F1, and affected PAZs five to ten miles are shown in table below:
- For wind speed > 5 mph, use table below to determine downwind affected PAZs

CATAWBA PAZS

Wind direction (Degrees From North) North (N) = 0 ⁰	Wind speed ≥ 5 mph (PAZs) 2 miles around and 5 miles downwind	Downwind Protective Action Zones (PAZs) distances 5 miles to 10 miles
348.75 - 11.25	A0, B1, C1, D1	B2, C2, D2
11.26 - 33.75	A0, C1, D1	C2, D2
33.76 - 56.25	A0, C1, D1, E1	C2, D2, E2
56.26 - 78.75	A0, C1, D1, E1, F1	C2, D2, E2, F2
78.76 - 101.25	A0, C1, D1, E1, F1	D2, E2, F2
101.26 - 123.75	A0, D1, E1, F1	D2, E2, F2, F3
123.76 - 146.25	A0, E1, F1	E2, F2, F3
146.26 - 168.75	A0, A1, E1, F1	A2, E2, F2, F3
168.76 - 191.25	A0, A1, E1, F1	A2, F2, F3
191.26 - 213.75	A0, A1, B1, E1, F1	A2, B2, F2, A3, F3
213.76 - 236.25	A0, A1, B1, F1	A2, B2, F2, A3, F3
236.26 - 258.75	A0, A1, B1, F1	A2, B2, A3, F3
258.76 - 281.25	A0, A1, B1, C1	A2, B2, C2, A3
281.26 - 303.75	A0, A1, B1, C1	A2, B2, C2, A3
303.76 - 326.25	A0, B1, C1	B2, C2, A3
326.26 - 348.74	A0, B1, C1, D1	B2, C2, D2

Protective Action Zones Determination Table

5.2.2 For **McGuire**, determine affected Emergency Planning Zone (EPZ) Protective Action Zones (PAZs) based on direction wind is blowing from (degrees from **North (N) = 0°**) and wind speed.

- For wind speed ≤ 5 mph, affected PAZs include all PAZs out to five miles:
L,B,M,C,N,A,D,O,R.
- For wind speed > 5 mph, use table below to determine downwind affected PAZs:

MCGUIRE PAZS

Wind direction (Degrees From North) North (N) = 0°	Wind speed ≥ 5 mph (PAZs) 2 miles around and 5 miles downwind	Downwind Protective Action Zones (PAZs) distances 5 miles to 10 miles
0 - 22.5	L,B,M,C,D,O,R	E,S,F
22.6 - 45.0	L,B,M,C,D,O,R	E,Q,S
45.1 - 67.5	L,B,M,C,D,O,R	E,Q,S
67.6 - 90.0	L,B,M,C,D,O,R,N	P,Q,S
90.1 - 112.5	L,B,M,C,O,R,N	K,P,Q,S
112.6 - 135.0	L,B,M,C,O,N,R,A	I,K,P,Q,S
135.1 - 157.5	L,B,M,C,O,A,N	I,K,P,Q
157.6 - 180.0	L,B,M,C,A,N	I,J,K,P
180.1 - 202.5	L,B,M,C,A,N	G,H,I,J,K,P
202.6 - 225.0	L,B,M,C,A,N,D	G,H,I,J,K,P
225.1 - 247.5	L,B,M,C,A,D	F,G,H,I,J
247.6 - 270.0	L,B,M,C,A,D	F,G,H,I,J
270.1 - 292.5	L,B,M,C,A,D	E,F,G,H,I
292.6 - 315.0	L,B,M,C,A,D	E,F,G
315.1 - 337.5	L,B,M,C,D,R	E,F,G
337.6 - 359.9	L,B,M,C,D,R	E,F,S

Enclosure 5.3
Steam Source Term Release

SH/O/B/2005/001
Page 1 of 3

- 5.3.1 Determine type of accident, source term release path and EMF monitor method.
- 5.3.2 Select an Accident Type for an affected release pathway:
- SGTR - steam generator tube rupture (normal coolant)
 - SGTRG - steam generator tube rupture gap release
 - SGTRM - steam generator tube rupture core melt
- 5.3.3 Select affected steamline EMF Noble Gas Method and corresponding monitor reading:
- As necessary query OAC data or manually enter steamline EMF reading.
- 5.3.4 Select Steam Generator (SG) reduction factors; **Partitioned** (e.g., tube break below secondary side water level and SG is not overfilled) or **Not Partitioned** (e.g., break above secondary side water level or SG overfilled).
- 5.3.5 Use Raddose 5 to calculate source term assessment - steam release in Ci/sec.
- Ci/sec is distributed by isotope spectrum based on accident type and time after reactor shutdown
 - Raddose 5 calculates the steam source term as follows:
$$RR = EMF \times CF \times AJ \times LR \times (0.41 \text{ ft}^3/\text{lbm} \times 28320 \text{ ml/ft}^3 \times 1\text{E-}6 \text{ Ci/}\mu\text{Ci} \times 1/3600 \text{ hr/s})$$

Where:

RR = release rate activity in Ci/sec

CF = steam line radiation monitor Correlation Factor

EMF = radiation monitor reading in mR/hr (normally a 15 minute average reading)

AJ = Adjustment Factor (unit-less) based on accident types (SGTR, SGTRG, SGTRM)

LR = Steam release rate from safety valve in pounds mass of steam released through each valve during valve open period (lbm/hr), where; default release rate = 2.094E5 lbm/hr

Enclosure 5.3
Steam Source Term Release

SH/O/B/2005/001
Page 2 of 3

5.3.6 If desired, use Raddose 5 to calculate source term - steam release using isotopic grab sample (GRABSL).

$$RR = SL_g \times LR \times (0.41 \text{ ft}^3/\text{lbm} \times 28320 \text{ ml}/\text{ft}^3 \times 1\text{E-}6 \text{ Ci}/\mu\text{Ci} \times 1/3600 \text{ hr}/\text{s})$$

Where:

RR = release rate activity in Ci/sec

SL_g = secondary grab sample (μCi/ml)

LR = steam release rate from safety valves pounds mass of steam released through the respective valves during the valve open period (lbm/hr) default release rate = 2.094E5 lbm/hr

5.3.7 If desired, use Raddose 5 to calculate source term - steam release using back calculate method (BACKSL).

$$RR = \text{Field Measurement Device Reading (mR/hr)} \times \text{FM Device Correlation} \\ (\mu\text{Ci}/\text{cc})/(\text{mR}/\text{hr})/X/Q(\text{sec}/\text{m}^3) \times (1\text{E-}6 \text{ Ci}/\mu\text{Ci} \times 1\text{E+}6 \text{ cc}/\text{m}^3=1)$$

5.3.8 **For Catawba only**, use Step 5.3.9 source term assessment worksheet steam generator tube rupture coincident with loss of offsite power; when appropriate and due to the following:

- Loss of offsite power and steamline radiation monitor is unavailable
- Primary to secondary coolant leakage is occurring
- Steam source term release is occurring
- Steam generator sample cannot be obtained
- Computer program for calculating steam release is not available

Enclosure 5.3
Steam Source Term Release

SH/O/B/2005/001
Page 3 of 3

5.3.9 (Catawba Only) Source term assessment worksheet with steam generator tube rupture coincident with loss of offsite power for unavailable Steam Line Monitor EMF _____.

Unit _____ Dose Projection based on: ____/____/____:____ Time since trip: _____ hours
mm dd yy hh mm

EMF53 reading* Correction Factor** LRps dT Lbsmr*** 1/VOPEN

_____ R/hr x _____ $\frac{\mu\text{Ci/ml}}{\text{R/hr}}$ x _____ $\frac{\text{gal}}{\text{min}}$ x _____ min x _____ $\frac{\text{lbsmr}}{2400 \text{ lbm}}$ x _____ $\frac{1}{\text{sec}}$

*Note: If EMF53 < 5 R/hr, use 5 R/hr.

x $3.785\text{E-}3 \frac{\text{Ci ml}}{\mu\text{Ci gal}}$ x = _____ $\frac{\text{Activity noble Gas}}{\text{Ci sec}}$

Activity noble Gas x Iodine Ratio LOCA = _____ $\frac{\text{Activity LOCA Iodine 131 Equivalent}}{\text{Ci/sec}}$

Activity noble Gas x Iodine Ratio core melt = _____ $\frac{\text{Activity Lcore Melt Iodine 131 Equivalent}}{\text{Ci/sec}}$

Where:

LRps = Primary to secondary leak rate in gal/min.

dT = Time that primary to secondary leakage has lasted from the start of the leak to the time of date that the projection is based on, in minutes.

Lbsmr = Mass of steam released from the PORV and/or code safety valves, in lbm.

VOPEN = Time the valve(s) are open in hours.

3.785E-3 = $1\text{E-}6 \text{ Ci}/\mu\text{Ci} \times 3.785\text{E}3 \text{ ml/gal}$

2400 = Mass of steam in the faulted steam generator; conservative value is 2400 lbm (mass of steam from S/G nozzle to MSIV)*** If Lbsmr > 2400 lbm; use 2400 lbm.

Time since Rx Trip (hours)	EMF 53 Correction Factor ** (CF)	Iodine Ratio LOCA	Iodine Ratio Core Melt
≥ 0	7.74 E+3	1.52 E-3	4.23 E-3
≥ 2	9.82 E+3	1.95 E-3	1.46 E-3
≥ 4	9.96 E+3	2.24 E-3	2.21 E-2
≥ 8	1.28 E+4	2.63 E-3	4.09 E-2
≥ 24	2.15 E+4	3.00 E-3	1.14 E-1
≥ 48	3.69 E+4	3.05 E-3	1.78 E-1

Emergency ☐ or Drill ☐ Prepared by: _____

Enclosure 5.4
Containment Source Term Release

SH/0/B/2005/001
Page 1 of 2

- 5.4.1 Determine type of accident source term release path and EMF monitor method.
- 5.4.2 Select an Accident Type for an affected release pathway:
- LOCA-Loss of Coolant Accident (normal coolant)
 - LOCAG-Loss of Coolant Accident gap release
 - LOCAM-Loss of Coolant Accident core melt
- 5.4.3 Select affected containment EMF Noble gas method and corresponding monitor reading:
- As necessary, query OAC data or manually enter containment EMF reading
 - CONL-EMF39L
 - CONH-EMF39H
 - CONHH-EMF53A/B or 51A/B
- 5.4.4 Select containment reduction factors for Ice Condenser pass through; Containment Hold Up Time, and Containment Spray status (on or off).
- 5.4.5 Use Raddose 5 to calculate source term assessment - containment release in Ci/sec.
- Ci/sec is distributed by isotope spectrum based on accident type and time after reactor shutdown

NOTE: Containment source term can be calculated using containment EMF readings, containment samples, or field team data. Reference 2.2 can be used if no other data is available.

- Raddose 5 calculates the containment source term as follows:

$$RR = EMF \times CF \times AJ \times BY \times Ci/\mu Ci \times 1/3600 \text{ hr/sec}$$

Where:

$$RR = \text{release rate activity in Ci/sec}$$

$$EMF = \text{EMF39(L) count per minute (cpm) and } EMF39(L) \leq 1E+7 \text{ cpm; and containment sample line is not isolated and/or containment EMF sample pump is not tripped (CONL Method)}$$

- EMF = EMF39(H) cpm whenever EMF39(L) reading is $> 1\text{E}+7$ cpm (offscale) and EMF39(H) cpm $\leq 1\text{E}+6$ cpm and/or sample line is not isolated and sample pump is not tripped (CON-H Method)
- EMF = EMF53A/B - CNS or EMF51A/B - MNS R/hr reading whenever EMF39(H) is $> 1\text{E}+6$ cpm (offscale) or EMF39 sample line is isolated, or EMF containment sample pump is tripped (CONHH Method)
- CF = Containment Noble Gas monitor Correlation Factor
- AJ = Adjustment Factors for Noble Gas; Iodine's and Particulates
- BY = Containment Bypass Fraction - Fraction of containment leakage of gases from inside containment which bypasses the annulus and auxiliary building and passes directly to the environment where, (default value = 0.07)
- LR = Leak Rate of containment air to the annulus or environment (ml/hr) based on one of the following methods:
- (a) Based on containment pressure and hole size corresponding to:
 - 1. Normal Leakage - 0.3% per day at design pressure (15 psig)
 - 2. Small Hole - 100% per day at design pressure (15 psig)
 - (b) Pre-defined Leak Rate corresponding to:
 - 1. Normal Leakage (0.3% per day)
 - 2. Small Hole (100% per day)
 - 3. Large Hole (100% per hour)

5.4.6 If desired, use Raddose 5 to calculate source term - containment release using isotopic grab sample (GRABC), and Post Accident Containment Air Sampling System, Reference 2.3.

$$RR = \text{CON}_g \times \text{BY} \times \text{LR} \times (1\text{E}-6 \text{ Ci}/\mu\text{Ci} \times 1/3600/\text{hr}/\text{sec})$$

Where:

CON_g = Containment grab sample ($\mu\text{Ci}/\text{ml}$)

- All other parameters as defined in previous Step 5.4.4

- 5.5.1 Determine type of accident, source term release pathway, and EMF monitor method.
- 5.5.2 Select and enter an accident type for affected release pathway.
- LOCA - Loss of Coolant Accident (normal coolant)
 - LOCAG - Loss of Coolant Accident gap release
 - LOCAM - Loss of Coolant Accident core melt
 - LOCO - LOCA outside of containment (normal coolant)
 - LOCOG - LOCA outside of containment gap release
 - LOCOM - LOCA outside of containment core melt
 - SGTR - Steam Generator Tube Rupture (normal coolant) with Condensate Stem Air Ejector(CSAE) pathway to unit vent
 - SGTRG - Steam Generator Tube Rupture gap release Condensate Steam Air Ejector (CSAE) pathway to unit vent
 - SGTRM - Steam Generator Tube Rupture core melt Condensate Steam Air Ejector (CSAE) pathway to unit vent
 - FUEL - Fuel handling gas release
- 5.5.3 Select affected unit and vent EMF Noble gas method.
- | | |
|--|--|
| • UV1L - Unit Vent 1EMF - 36L | UV2L - Unit Vent 2EMF – 36L |
| • UV1H - Unit Vent 1EMF - 36H | UV2H - Unit Vent 2EMF - 36H |
| • UV1HH - Unit Vent 1EMF - 54 (CNS)
1EMF - 36HH (MNS) | UV2HH - Unit Vent 2EMF - 54 (CNS)
2EMF - 36HH (MNS) |
- Select vent filtration reduction factors, (e.g., vent filter on or off)
 - Use on-scale EMF readings when vent EMF sample pump is not tripped or EMF package is not isolated; as a result loss of power and/or EMF54 - CNS or EMF36HH - MNS Trip-2
 - As necessary re-query EMF OAC data or manually enter vent EMF reading
- 5.5.4 Verify or enter the unit vent flow rate (cfm).

5.5.5 Evaluate vent release selecting monitoring for each of the affected unit vents.

5.5.6 Use Raddose 5 to calculate source term assessment - vent release in Ci/sec.

- Ci/sec is distributed by isotope spectrum based on accident type and time after reactor shutdown.
- Raddose 5 calculates unit vent source term as follows:

$$RR = EMF \times CF \times AJ \times FR \times 1E-6 \text{ Ci}/\mu\text{Ci} \times 1/60 \text{ min/sec} \times 28320 \text{ ml/ft}^3$$

Where:

RR = release rate activity in Ci/sec

EMF = Use EMF36L counts per minute (cpm), if reading $\leq 1E+7$ cpm and vent EMF sample pump is not tripped (UV1L, UV2L)

EMF = Use EMF36H cpm reading if EMF36L is offscale and EMF36H $\leq 1E+6$ cpm and sample pump is not tripped (UV1H, UV2H)

EMF = Use EMF54 - CNS, EMF36HH - MNS (R/hr) reading if EMF36L and EMF36H are offscale, and/or vent EMF sample pump is tripped (UV1HH, UV2HH)

CF = Unit Vent radiation monitor Noble Gas Correlation Factor

AJ = Adjustment Factors for Noble Gas, Iodines and Particulates for accident types

FR = Unit vent flow rate in ft^3 per minute, (No default rate); vent flow rate is a manual Raddose 5 input if query data is unavailable

5.5.7 If desired, use Raddose 5 to calculate source term - unit vent release using isotopic grab sample (GRABV1, GRABV2); obtain sample per Reference 2.4.

$$RR = UV_g \times FR \times 1E-6 \text{ Ci}/\mu\text{Ci} \times 1/60 \text{ min/sec} \times 28320 \text{ ml/ft}^3$$

Where:

RR = release rate activity in Ci/sec.

UV_g = unit vent grab sample ($\mu\text{Ci/ml}$)

FR = Unit vent flow rate in ft^3 per minute; (No default rate); vent flow rate is a manual Raddose 5 input if queried data is unavailable.

Unit Vent Source Term Release

5.5.8 If desired, use Raddose 5 to calculate source term - unit vent release using back calculate method (UV1-BACK, UV2-BACK).

$$RR = \text{Field Measurement Device Reading (mR/hr)} \times \text{FM Device Correlation} \\ (\mu\text{Ci/cc})/(\text{mR/hr})/X/Q(\text{sec/m}^3) \times (1\text{E-}6 \text{ Ci}/\mu\text{Ci} \times 1\text{E+}6 \text{ cc/m}^3=1)$$

5.5.9 If desired, use Raddose 5 to calculate source term - vent release using release (Ci/sec) direct entry (UVI-DRCT, UV2-DRCT).

- Enter NG Release Rate(Ci/sec)
- Enter Iodine Release Rate (Ci/sec)
- Enter Particulate Release Rate(Ci/sec)

Enclosure 5.6
Radiological Emergency Action Levels

SH/0/B/2005/001
Page 1 of 1

5.6.1 Evaluate the Emergency Action Levels (EALs) based on radiological conditions in the affected site's EAL procedure:

CNS - RP/0/A/5000/001 - Classification of Emergency

MNS - RP/0/A/5700/000 - Classification of Emergency

Enclosure 5.7
Raddose 5 Green Form

SH/0/B/2005/001
Page 1 of 1

EMERGENCY NOTIFICATION

1. ☐ THIS IS A DRILL ☐ ACTUAL EMERGENCY ☐ INITIAL ☐ FOLLOW-UP MESSAGE NUMBER _____

2. SITE: Catawba UNIT: _____ REPORTED BY: _____

3. TRANSMITTAL TIME/DATE: _____ / _____ / _____ CONFIRMATION PHONE NUMBER: _____
(Eastern) mm/dd/yy

4. AUTHENTICATION (If Required): _____
(Number) (Codeword)

5. EMERGENCY CLASSIFICATION:
☐ NOTIFICATION OF UNUSUAL EVENT ☐ ALERT ☐ SITE AREA EMERGENCY ☐ GENERAL EMERGENCY

6. ☐ Emergency Declaration At: ☐ Termination At: TIME/DATE: _____ / _____ / _____ (If B, go to item 16)
(Eastern) mm dd yy

7. EMERGENCY DESCRIPTIONS/REMARKS: _____

8. PLANT CONDITION: ☐ IMPROVING ☐ STABLE ☐ DEGRADING

9. REACTOR STATUS: ☐ SHUTDOWN: TIME/DATE: _____ / _____ / _____ ☐ _____ % POWER
(Eastern) mm dd yy

10. EMERGENCY RELEASE(S):
☐ NONE (Go to item 14) ☐ POTENTIAL (Go to item 14) ☐ IS OCCURRING ☐ HAS OCCURRED

**11. TYPE OF RELEASE: ☐ ELEVATED ☒ GROUND LEVEL

☐ AIRBORNE: STARTED: 00:00 STOPPED: _____ / _____ / _____
Time (Eastern) Date Time (Eastern) Date

☐ LIQUID: STARTED: _____ / _____ / _____ STOPPED: _____ / _____ / _____
Time (Eastern) Date Time (Eastern) Date

**12. RELEASE MAGNITUDE: ☒ Curies Per Sec ☐ Curies NORMAL OPERATING LIMITS: ☒ BELOW ☐ ABOVE

☐ NOBLE GASES 0.00E+00 ☐ IODINES 0.00E+00
☐ PARTICULATES 0.00E+00 ☐ OTHER _____

**13. ESTIMATE OF PROJECTED OFFSITE DOSE: ☐ NEW ☐ UNCHANGED PROJECTION TIME: _____
(Eastern)

	TEDE mrem	Thyroid CDE mrem	ESTIMATED DURATION: 1 HRS.
SITE BOUNDARY	0.00E+00	0.00E+00	
2 MILES	0.00E+00	0.00E+00	
5 MILES	0.00E+00	0.00E+00	
10 MILES	0.00E+00	0.00E+00	

**14. METEOROLOGICAL DATA: ☐ WIND DIRECTION (from) _____ deg ☐ SPEED (mph) _____
☐ STABILITY CLASS _____ ☐ PRECIPITATION (type) _____ in/15 min

15. RECOMMENDED PROTECTIVE ACTIONS:
☐ NO RECOMMENDED PROTECTIVE ACTIONS
☐ EVACUATE
☐ SHELTER IN-PLACE
☐ OTHER _____

16. APPROVED BY: _____ TIME/DATE: _____ / _____ / _____
(Name) (Title) (Eastern) mm dd yy

* If Items 8-14 have not changed, only Items 1-7 and 15-16 are required to be completed
** Information may not be available on initial notification