EMERGENCY PLAN IMPLEMENTING PROCEDURES INDEX

Procedure #	Title
EP/O/A/5000/05	Notification of Unusual Event
EP/O/A/5000/06	Alert
EP/O/A/5000/07	Site Area Emergency
EP/O/A/5000/08	General Emergency
AP/O/A/5500/27	Care and Transporation of Contaminated Injured Individuals
AP/O/A/5500/29	Natural Disasters
AP/O/A/5500/30	Earthquake
AP/O/A/5500/31	Release of Toxic or Flammable Gases
AP/O/A/5500/32	Collisions/Explosions
OP/O/A/6200/48	Operating Procedure for the Operation of the Post Accident Liquid Sample System
HP/O/B/1009/02	Alternative Methods for Determining Dose Rate within the Reactor Building
HP/O/B/1009/03	Recovery Plan
HP/O/B/1009/04	Procedure for Estimating Food Chain Doses Under Post Accident Conditions
HP/O/B/1009/05	First Response Evaluation of Offsite Dose From a Reactor Coolant Leak Inside Containment
HP/O/B/1009/06	Procedure for Quantifying High Level Gaseous Radioactivity Release During Accident Conditions
HP/O/B/1009/08	Evaluation of a Reactor Coolant Leak Inside Containment
HP/O/B/1009/09	Release of Reactor Coolant through Unit Vent Exceeding Technical Specifications
HP/O/B/1009/10	Releases of Liquid Radioactive Exceeding Technical Specifications
HP/O/B/1009/15	Nuclear Post Accident Containment Air Sampling System Operating Procedure
HP/O/B/1009/16	Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release
PT/O/A/4600/06	Exercises and Drills
PT/O/A/4600/11	Functional Check of Emergency Vehicle and Equipment
Station Directive 2.0.5	News Release
Station Directive 2.5.1	Emergency Response Training Program
Station Directive 3.7.3	Bomb Threat
Station Directive 3.8.1	Site Assembly/Evacuation
Station Directive 3.8.2	Station Emergency Organization
McGuire Nuclear Station Health Physics Manual	Section: 18.1 Accident and Emergency Response 18.2 Environmental Monitoring for Emergency Conditions 18.3 Personnel Monitoring for Emergency Conditions

Rev. 3
August 1982

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: AP/0/A/5500/27
Change(s) 0 to
1 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Care and Transportation of Contaminated Injured Individual(s) From Site to Offsite Medical Facility

(4) PREPARED BY: M. S. Grover DATE: 7/12/82

(5) REVIEWED BY: [signature] DATE: 7/15/82

Cross-Disciplinary Review By: Jeff V. Almond N/R: _____

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: Tony L. McConnell Date: 7/15/82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
CARE AND TRANSPORTATION OF CONTAMINATED INJURED
INDIVIDUAL(S) FROM SITE TO OFF-SITE MEDICAL FACILITY

1.0 Symptoms

1.1 Individual contaminated to levels >1000 dpm/100cm^2 Beta-Gamma (loose), or 5000 dpm/100cm^2 Beta-Gamma (fixed and loose total) or >50 dpm/100cm^2 Alpha and in need of offsite medical attention.

2.0 Immediate Actions

2.1 Automatic

N/A

2.2 Manual

2.2.1 Perform any life saving first aid if necessary.

2.2.2 Notify Shift Supervisor.

2.2.3 Notify Health Physics.

3.0 Subsequent Actions

3.1 The Shift Supervisor shall contact any outside services needed:

3.1.1 North Mecklenburg Ambulance Service (See Enclosure 4.3)

3.1.2 North Mecklenburg Rescue Squad (See Enclosure 4.3)

3.2 Health Physics shall accompany the contaminated injured individual(s) to the doctor or hospital.

3.2.1 Health Physics shall minimize the spread of contamination during transportation by covering the individual(s) with sheets or blankets and lining the stretcher with poly. This is not to interfere with life saving first aid.

3.2.2 Health Physics shall ensure that the Medical Decontamination Kit and an RM-14 with HP-210 probe, accompany contaminated injured individuals(s) to the hospital. (Kit is stored in the Auxillary Building First Aid Room.)

3.3 In case of contamination not involving severe injury, decontamination shall be performed in the first aid room in the Radiation Control Area of the station, prior to transportation to a medical facility. However, decontamination shall not interfere with or take precedence over proper medical or surgical care as determined by the Station Nurse or First Aid personnel.

3.3.1 Decontamination shall be performed by Health Physics with assistance from the Station Nurse or First Aid Personnel.

3.4 Commence "Notification of Unusual Event" as per EP/0/A/5000/05.

3.5 Medical Assistance for Contaminated and Injured persons is provided by Charlotte Memorial Hospital.

3.5.1 The Shift Supervisor shall contact the Emergency Room at Charlotte Memorial Hospital, and shall provide them with information concerning the contaminated injured individual(s) ie: burns, fractures, head injuries, levels of contamination, He shall also inform the emergency room as to the mode of emergency transporation utilized. (See Enclosure 4.3).

3.5.2 Charlotte Memorial Hospital may call back to the station for verification.

3.6 Back-up Medical Facility

3.6.1 In the event that Charlotte Memorial Hospital cannot provide complete assistance or in the event they may request additional expertise in the management of a radiation accident victim(s), the Shift Supervisor/Emergency Coordinator shall contact the Department of Energy, Radiation Emergency Assistance Center Training Site (REACTS), in Oak Ridge Tennessee for assistance. (See Enclosure 4.3).

3.7 Personnel taken to Charlotte Memorial Hospital will be delivered to the Emergency Room except in the case of extreme contamination in which case personnel will be delivered as directed by the hospital.

NOTE: The Ambulance Service or Rescue Squad will maintain radio communications with the medical facility while enroute.

3.8 Upon completion of transporation, Health Physics personnel will survey the ambulance or rescue vehicle(s) and personnel and equipment and assist in any necessary decontamination. Health Physics personnel will also assist the hospital in survey of and necessary decontamination of hospital equipment, spaces or personnel.

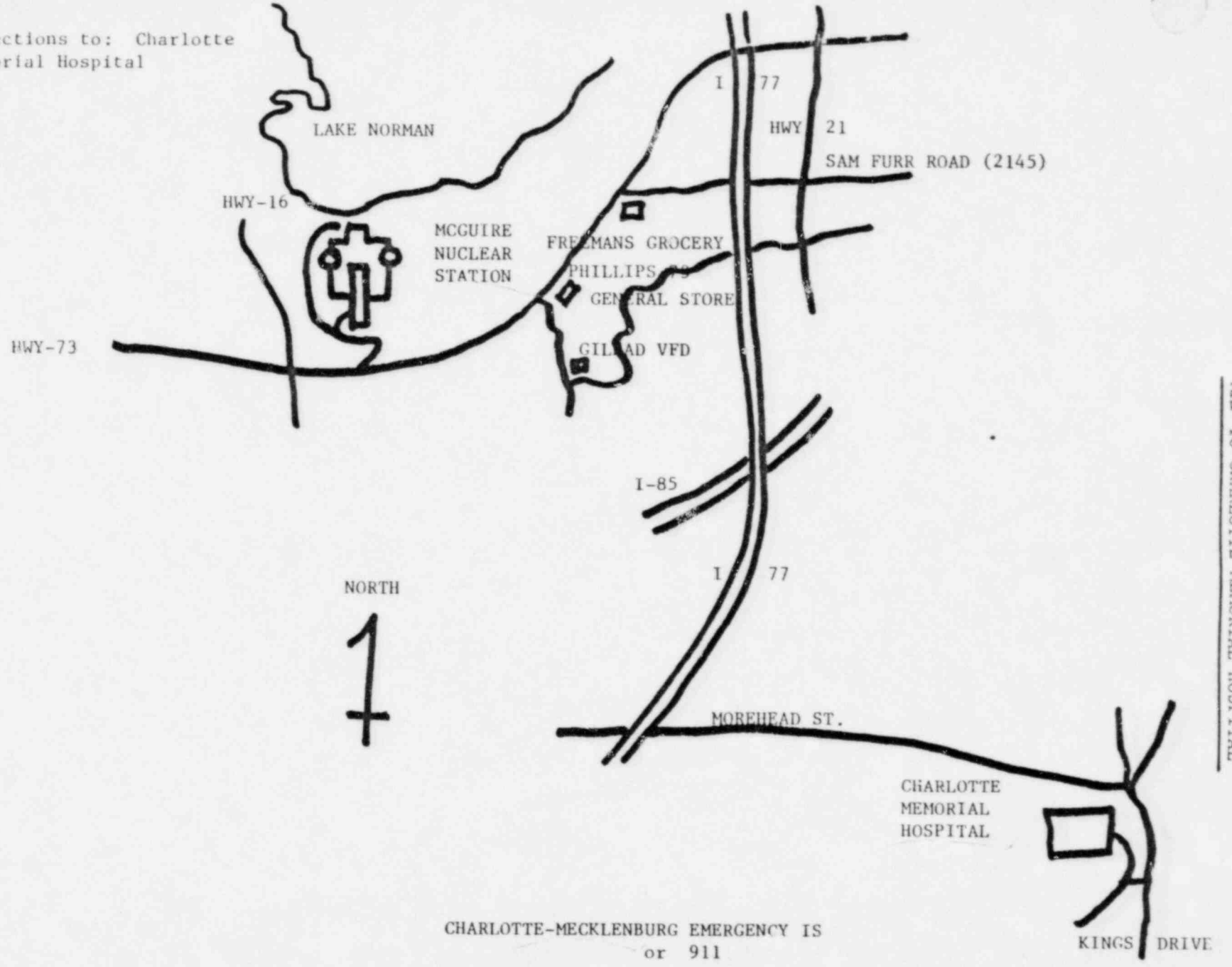
4.0 Enclosures

4.1 Map to Charlotte Memorial Hospital

4.2 Personnel Survey Sheet

4.3 Telephone List

Directions to: Charlotte Memorial Hospital

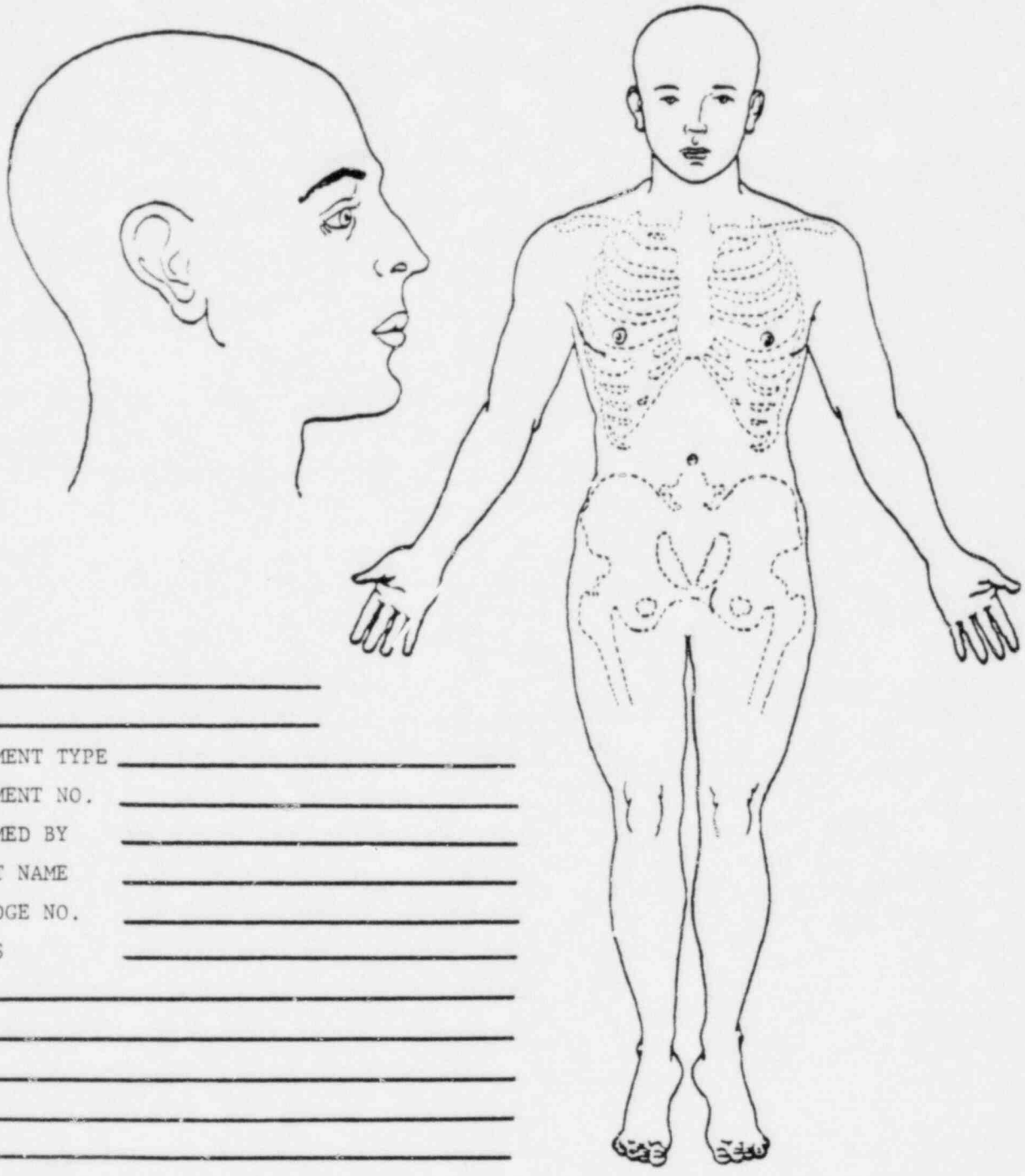


MAP TO CHARLOTTE MEMORIAL HOSPITAL

CHARLOTTE-MECKLENBURG EMERGENCY IS
or 911

AP/0/A/5500/27
Enclosure 4.1

PERSONNEL SURVEY SHEET



DATE _____

TIME _____

INSTRUMENT TYPE _____

INSTRUMENT NO. _____

PERFORMED BY _____

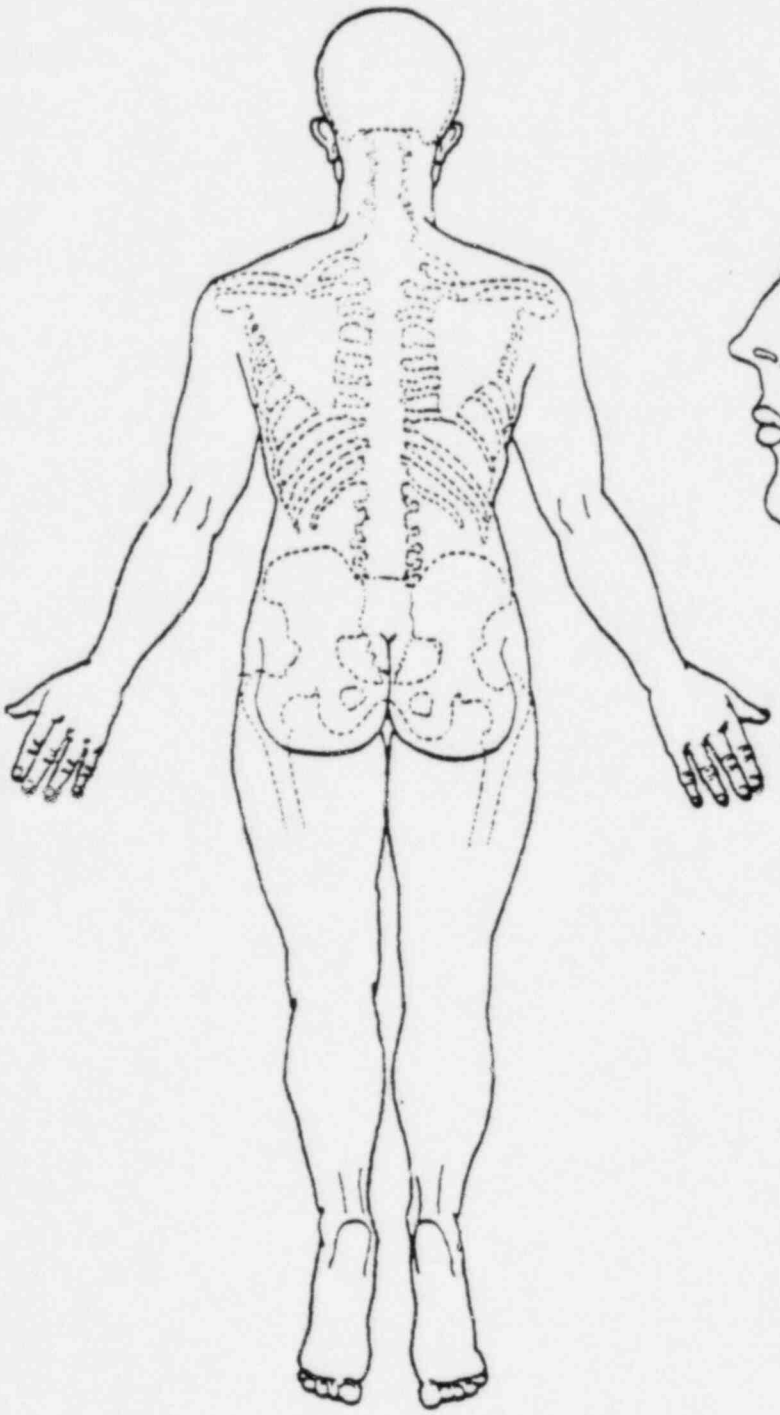
PATIENT NAME _____

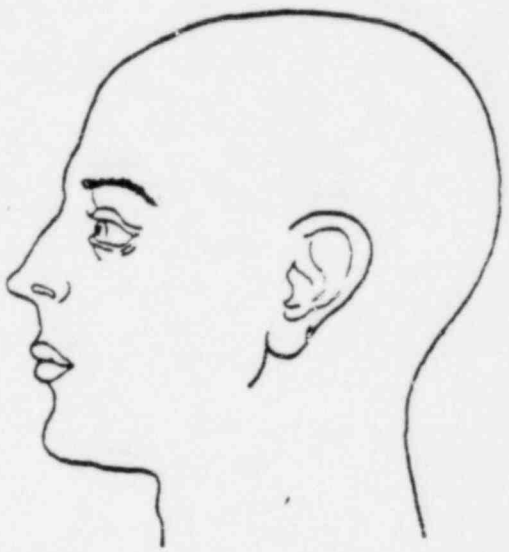
TLD BADGE NO. _____

REMARKS _____

NOTE: Include in remarks, history of accident, medical treatment rendered, medical facility, Doctor's name, final disposition. Use additional sheets if necessary.

PERSONNEL SURVEY SHEET
(CONT.)





TELEPHONE LIST

4.3.1 Health Physics - Plant Phone)

4.3.2 Charlotte Memorial Hospital E.R. - , 2, 3, 4.

4.3.4 Radiation Emergency Assistance Center Training Site (REACTS)

4.3.5 North Mecklenburg Ambulance Service

4.3.6 North Mecklenburg Rescue Squad -

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: EP/0/A/5000/05
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Notification of Unusual Event

(4) PREPARED BY: M. S. Glover DATE: 7/21/82

(5) REVIEWED BY: T. D. Gilbert DATE: 7-26-82

Cross-Disciplinary Review By: _____ N/R: N/A

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: [signature] Date: 7-30-82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY

McGUIRE NUCLEAR STATION

NOTIFICATION OF UNUSUAL EVENT

1.0 Symptoms

1.1 This condition exists whenever unusual events are in process or have occurred which indicate a potential degradation of the level of safety of the plant.

2.0 Immediate Actions

2.1 Automatic

None

2.2 Manual

2.2.1 The Shift Supervisor shall be informed of all events initiating this procedure.

3.0 Subsequent Action

Initial/N/A

_____/_____ 3.1 The Shift Supervisor shall assure that the appropriate emergency condition is declared by comparing the Emergency Action Level(s) and Initiating Condition(s) listed in Enclosure 4.1 to those of the actual plant condition.

_____/_____ 3.2 The Shift Supervisor shall assure that all actions required by the initiating Emergency Procedure will be performed and that all actions necessary for the protection of persons and property are being taken.

NOTE

If at any time in the course of events in this procedure, site evacuation or personnel assembly/accountability appears necessary, refer to Station Directive 3.8.1.

_____/_____ 3.3 The Shift Supervisor shall assume the function of the Emergency Coordinator until the arrival of the Station Manager or his designee at which time the Station Manager or his designee assumes the responsibility of the Emergency Coordinator.

/ 3.4 The Emergency Coordinator shall assure prompt (within about 15 minutes of declaring the emergency) notification of those personnel/Warning Points indicated on Enclosure 4.2 for the appropriate Initiating Condition/Emergency Procedure listed in Enclosure 4.1.

NOTE 1.

See Enclosure 4.3, Telephone Listing, for notification, telephone numbers/radio codes/pager codes.

NOTE 2.

See Enclosure 4.4, Notification of Emergency Conditions, for information to be provided to State/County Warning Points.

NOTE 3.

See Enclosure 4.5, Notification of Emergency Conditions for information to be provided to Steam Production Duty Engineer/Corporate Communications Department.

/ 3.5 In the event a release or potential release of radioactive materials is a threat to plant personnel or members of the general public the Emergency Coordinator shall request Health Physics personnel to evaluate the consequences utilizing the appropriate Health Physics procedure, HP/0/B/1009/05, HP/0/B/1009/06, HP/0/B/1009/08, HP/0/B/1009/09 or HP/0/B/1009/10.

/ 3.6 The Emergency Coordinator shall provide protective action recommendations as necessary to the affected county warning point(s) and to the North Carolina warning point (Emergency Operations Centers if established) or the State Radiological Protection Section, Department of Human Resources (see Enclosure 4.3 Telephone Listing) as directed by the state in accordance with the North Carolina Radiological Emergency Response Plan. If actual release of radioactive materials will result in a projected dose (REM) to the population of: (EPA Protective Action Guidelines).

3.6.1 Whole body <1, thyroid <5, NO protective action is required. Monitor environmental radiation levels to verify.

3.6.2 Whole body 1 to <5, thyroid 5 to <25, recommend seeking shelter and wait for further instructions. Consider evacuation particularly for children and pregnant women. Monitor environmental radiation levels. Control access to affected areas.

3.6.3 Whole body 5 and above, thyroid 25 and above, recommend mandatory evacuation of populations in the affected areas. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.

NOTE

See Enclosure 4.3, Telephone Listing for notification.

___/___ 3.7 The Emergency Coordinator shall augment on shift resources to assess and respond to the emergency situation as needed to ensure the protection of persons and property.

___/___ 3.8 The Emergency Coordinator will assess the Emergency Condition and determine the need to remain in a Notification of Unusual Event, escalate to a more severe class or close out the emergency.

___/___ 3.9 The Projects and Licensing Engineer or his designee will close out the Emergency with verbal summary to county and State authorities, notified in Step 3.4, followed by written summary within 24 hours.

4.0 Enclosures

4.1 List of Initiating Conditions, Emergency Action Levels, and Associated Emergency Procedure/Document.

4.2 Notification Chart

4.3 Telephone Listing

4.4 Notification of Emergency Conditions.

4.5 Notification of Emergency Conditions (Steam Production Duty Engineer/Corporate Communication Department).

LIST OF INITIATING CONDITIONS, EMERGENCY ACTION LEVELS, AND ASSOCIATED EMERGENCY PROCEDURE/DOCUMENT

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.1	Emergency Core Cooling Initiated (SI)	Safety Injection signal verification by redundant indication.	EP/1/A/5000/01, EP/1/A/5000/02, EP/1/A/5000/03, EP/1/A/5000/04, AP/1/A/5500/35
4.1.2	Radiological effluent Technical Specification limits exceeded.	EMF49, 50, 35, 36, 37 Alarm indicating Technical Specification Limits exceeded.	Tech Specs 3/4.11, Environmental Tech Specs, HP/0/B/1009/09, HP/0/B/1009/10, HP/0/B/1009/05
4.1.3	Fuel Damage Indication:	a. High coolant activity sample exceeding Tech Specs. (>1 µCi/gram Dose Equivalent I-131 or $\frac{>100}{E}$ µCi/gram gross activity) NOTE: These calculations available from counting facility on request.	
		b. Increase greater than 0.1% equivalent fuel failures within 30 minutes.	
		c. Above verified by increased EMF48 readings and laboratory analysis.	AP/1/A/5500/18
4.1.4	Abnormal coolant temperature and/or pressure or abnormal fuel temperature outside of Technical Specification Limits.	Figure 2.1-1 Tech Specs exceeded and Core Subcooling Monitor less than acceptable. (Below Curve) Verified as necessary by redundant Instrumentation. (e.g, narrow and wide range pressure/temperature subcooling monitors)	AP/1/A/5500/05

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.5	Exceeding either primary/secondary leak rate Tech Specs or primary leak rate Technical Specifications	>1GMP total P/S leakage >500 GPD from any S/G >10GPM Identified Primary Leakage Verified by EMF readings, level control, make-up rate, and or chemical/radiological analysis.	EP/1/A/5000/02, EP/1/A/5000/04, AP/1/A/5500/10
4.1.6	Failure of a safety or relief valve in a safety related system to close, following reduction of applicable pressure. (Primary System (NC) or Main Steam (SM)).	Valid accoustical monitor indication of valve failure.	EP/1/A/5000/02, AP/1/A/5500/11, EP/1/A/5000/03
4.1.7	Loss of offsite power or loss of onsite AC power capability.	Undervoltage alarms on 7KV buses or blackout load sequencers actuated.	AP/1/A/5500/07
4.1.8	Loss of containment integrity requiring shutdown by Tech Specs (3/4.6.1).	Any automatic containment isolation valve found to be open and inoperable and unisolable or both air lock doors on a lock inoperable, or penetration(s) fail leak test per Tech Specs when containment integrity required.	AP/1/A/5500/24
4.1.9	Loss of engineered safety feature or fire protection system function requiring shutdown by Tech Specs (e.g., malfunction, personnel error, or procedural inadequacy).	ESF actuation system found inoperable or Fire Suppression Water System found inoperable per Tech Specs.	AP/1/A/5500/19, AP/1/A/5500/21, AP/1/A/5500/20, Tech Specs 3/4.5, 3/4.7.10, 3/4.7.11
4.1.10	Fire within the plant lasting more than 10 minutes.	Observation or fire detection alarm with confirming observation of a fire lasting more than 10 minutes.	Station Directive 2.11

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.11	Indications or alarms on process or effluent parameters not functional in Control Room to an extent requiring plant shutdown or other significant loss of assessment or communication capability (e.g., all meteorological instrumentation, or radio networks).	Loss of process or effluent radiation monitoring system or Loss of all meteorological instrumentation onsite or Loss of all radio/telephone communications capability offsite.	OP/0/A/6700/03, Tech Specs 3/4.3
4.1.12	Security threat or attempted entry or attempted sabotage.	As notified by Security Force.	Station Security Plan
4.1.13	Natural phenomenon being experienced or projected beyond usual levels.		
	a. Any earthquake felt in plant or detected on station seismic instrumentation.	(<.08gH, <.053gV), Annunciator Alarm, (AD-13)	
	b. 50-year flood or low water, hurricane surge, seiche (lake tidal wave)	As observed	
	c. Any tornado on site	As observed	
	d. Any hurricane	Winds >73 mph/from National Weather Service information.	AP/0/A/5500/29, AP/0/A/5500/30
4.1.14	Other hazards being experienced or projected.		
	a. Aircraft crash onsite or unusual aircraft activity over facility.	As observed	
	b. Train derailment on site.	As observed	
	c. Near site or onsite explosion.	As observed	

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.14	d. Near site or onsite toxic or flammable gas release.	As observed	AP/0/A/5500/31
	e. Turbine rotating component failure causing rapid plant shutdown (Loss of Condenser Heat Sink).	Turbine trip and observation of a turbine malfunction or failure.	AP/0/A/5500/23, AP/0/A/5500/32, AP/0/A/5500/02
4.1.15	Other plant conditions exist that in the judgement of the Shift Supervisor, the Operations Duty Engineer, the Superintendent of Operations, or the Station Manager warrant increased awareness on the part of State and/or local offsite authorities or require plant shutdown under Tech Specs requirements or involve other than normal controlled shutdown (e.g., cooldown rate exceeding Tech Specs limits, pipe cracking found during operation).	As determined by the Shift Supervisor/ Emergency Coordinator.	As directed by plant conditions.
4.1.16	Transporation of contaminated injured individual from site to offsite hospital.	As observed.	AP/0/A/5500/27
4.1.17	Rapid depressurization of secondary side.	As observed and actuation of 4.1.1 and 4.1.6 above.	AP/1/A/5500/06

NOTIFICATION CHART
NOTIFICATION OF UNUSUAL EVENT

INITIATING CONDITIONS (from ENCLOSURE 4.1)

TO BE NOTIFIED	4.1.1	4.1.2	4.1.3	4.1.4	4.1.5	4.1.6	4.1.7	4.1.8	4.1.9	4.1.10	4.1.11	4.1.12	4.1.13	4.1.14	4.1.15	4.1.16	4.1.17	INITIAL
Shift Supervisor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
OPS. Duty Engineer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Station Manager	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Supt. of Operations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Supt. of Tech. Services	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Project/Licen. Engineer	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Steam Production Duty Man	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Corporate Communications	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
N.C. State Warning Point	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mecklenburg Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Catawba Co. Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Lincoln Co. Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Gaston Co. Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Iredell Co. Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cabarrus Co. Warning Pt.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
NRC Via ENS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
NRC (Station Rep.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Construction Proj. Mngr.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Station Health Physicist	NO	X	X	NO	X	X*	NO	X	NO	X*	X	NO	X*	X*	X*	X	NO	
Station Safety Supervisor	NO	NO	NO	NO	NO	NO	NO	NO	X	X	NO	NO	X	X	NO	X	NO	
Supt. of Maintenance	NO	NO	NO	NO	NO	X	X	NO	X	X	X	NO	X	X	X	NO	NO	
Supt. of Administration	NO	NO	NO	NO	NO	NO	NO	NO	NO	X	NO	X	NO	NO	NO	NO	NO	

* - Whenever radiological hazards may be involved

X - To be notified

TELEPHONE LIST

4.3.1 Operations Duty Engineer (PA System)
P&T Pager -

4.3.2 Station Manager
Home - - System Speed - 12
Home - System Speed - 11

4.3.3 Superintendent of Operations -
Home - - System Speed - 13

4.3.4 Superintendent of Technical Services -
Home - System Speed - 14

4.3.5 Projects & Licensing Engineer -
Home - - System Speed - 32

4.3.6 Steam Production Duty Engineer - - System Speed - 51
- System Speed - 56

4.3.7 Duke Power Corporate Communications Staff - - System Speed - 52
(24 hour Answering Service, ask for Mary Cartwright, Ira Kaplan or Mary Boyd)

4.3.8 NC State Warning Point, Raleigh - - System Speed - 41

4.3.9 Mecklenburg County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 42
Back-up: Emergency Radio, Code: 21

4.3.10 Lincoln County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 43
Back-up: Emergency Radio, Code: 25

4.3.11 Catawba County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 44
Back-up: Emergency Radio, Code: 27

4.3.12 Iredell County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 45
Back-up: Emergency Radio, Code: 23

4.3.13 Gaston County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 46
Back-up: Emergency Radio, Code: 26

4.3.14 Cabarrus County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 47
Back-up: Emergency Radio, Code: 28

NOTE

Radio Code 20 will activate all county radio units.

4.3.15 N.R.C. Operation Center, Emergency Notification System (ENS phone)

4.3.16 N.R.C. Senior Station Representative
Office -
Home - System Speed - 57
Wife work - System Speed - 58
P&T Pager

4.3.17 Construction Project Manager: Construction
Home - System Speed 17 or
- System Speed 18

4.3.18 Station Health Physicist
Home System Speed - 31
P&T Pager

4.3.19 Station Safety Supervisor
Home - - System Speed - 38

4.3.20 Superintendent of Maintenance -
Home - System Speed - 15

4.3.21 Superintendent of Administration -
Home - - System Speed - 16

4.3.22 Radiation Protection Section Department of Human Resources
- System Speed - 48

MCGUIRE NUCLEAR STATION
NOTIFICATION OF EMERGENCY CONDITIONS

4.4.1 Include as a minimum, the following information to the North Carolina State Warning Point, and to the six County Warning Points (Mecklenburg, Catawba, Iredell, Lincoln, Gaston, and Cabarrus).

NOTE 1: See Enclosure 4.3, Telephone Listing

NOTE 2: A. Complete Part I of this format as a minimal first notification of a reportable incident.

B. Complete Part I and II of this format to provide minimal followup information.

PART I: Initial Emergency Message Information

"This is _____, _____,
(Name) (Title)
at McGuire Nuclear Station. I am notifying you of an incident at McGuire, Unit # _____. Please acknowledge when you are ready to copy emergency information."

1. This is McGuire Nuclear Station.
2. My name is _____.
3. This message (Number ___)
   _____ a. Reports a real emergency.
   _____ b. Is an exercise message.
4. My telephone number is _____.
5. Message Authentication: _____.
6. The class of emergency is:
   _____ a. Notification of an Unusual Event
   _____ b. Alert
   _____ c. Site Area Emergency
   _____ d. General Emergency
7. The Classification of Emergency was declared at: _____ on
   (A.M./P.M.)
   _____.
   (Date)

✓ ACKNOWLEDGEMENT	
Mecklenburg	____
Gaston	____
Iredell	____
Lincoln	____
Cabarrus	____
Catawba	____

8. The initiating event causing the Emergency Classification is:

_____

_____

_____

9. The Emergency Condition (Select one of the below options):

_____ a. Does not involve the release of radioactive materials from the plant.

_____ b. Involves the POTENTIAL for a release of but NO release is occurring.

_____ c. Involves a release of radioactive material.

10. We recommend the following protective action: (select one of the below options)

_____ a. No protective action is recommended at this time.

_____ b. People living in zones _____ remain indoors with doors and windows closed.

_____ c. People in zones _____ EVACUATE their homes and businesses.

_____ d. Pregnant women and children in zones _____ remain indoors with the doors and windows closed.

_____ e. Pregnant women and children in zones _____ evacuate to the nearest shelter/reception center.

_____ f. Other recommendations: _____

_____

_____

_____

11. There will be:

_____ a. A followup message

_____ b. No further communications

12. I repeat, this message:

_____ a. Reports an actual emergency.

_____ b. Is an exercise message.

13. Relay this information to the persons indicated in your alert procedures for an incident at McGuire Nuclear Station.

NOTE: Record the Name, Title, Date, Time, and Warning Point at end of Part II.

PART II: Followup Emergency Message Information

1. The type of actual or projected release is:

   _____ a. Airborne

   _____ b. Waterborne

   _____ c. Surface spill

   _____ d. Other

2. The source and description of the release is: _____

   _____

   _____

3. _____ a. Release began/will begin at _____a.m./p.m.; time since reactor trip is _____ hours.

   _____ b. The estimated duration of the release is _____ hours.

4. Dose projection base data:

   Radiological release: _____curies, or _____curies/sec.

   Windspeed: _____mph

   Wind direction: From ____°

   Stability class: _____(A,B,C,D,E,F, or G)

   Release height: _____Ft.

   Dose conversion factor: _____R/hr/Ci/M^3 (whole body)

   _____R/hr/Ci/M^3 (Child Throid)

   Precipitation _____

   Temperature at the site: _____°F

5. Dose projections:

Dose Commitment

Distance	Whole Body Rem/hour	(Child Thyroid) Rem/hour of inhalation
Site boundary		
2 miles		
5 miles		
10 miles		

Projected Integrated Dose In Rem

Distance	Whole Body	Child Thyroid
Site Boundary		
2 miles		
5 miles		
10 miles		

6. Field measurement of dose rate or contamination (if available):

_____

_____

7. Emergency actions underway at the facility include: _____

_____

8. Onsite support needed from offsite organizations: _____

_____

9. Plant status:
   a. Reactor is: not tripped/tripped
   b. Plant is at: ___% power/hot shutdown/cold shutdown/cooling down
   c. Prognosis is: stable/improving/degrading/unknown.
10. I repeat, this message:
   ____ a. Reports an actual emergency.
   ____ b. Is an exercise message.
11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

NOTE: Record the name, title, date, time, and warning point notified.

(1) _____ (Name) Communicator (Title)

_____ (Date) (Time) Mecklenburg (Warning Point)

(2) _____ (Name) Communicator (Title)

_____ (Date) (Time) Gaston (Warning Point)

(3) _____ (Name) Communicator (Title)

_____ (Date) (Time) Iredell (Warning Point)

(4) _____ (Name) Communicator (Title)

_____ (Date) (Time) Catawba (Warning Point)

(5) _____ (Name) Communicator (Title)

_____ (Date) (Time) Lincoln (Warning Point)

(6) _____ (Name) Communicator (Title)

_____ (Date) (Time) Cabarrus (Warning Point)

(7) _____ (Name) Communicator (Title)

_____ (Date) (Time) North Carolina (Warning Point)

NOTIFICATION OF EMERGENCY CONDITIONS

(Steam Production Duty Engineer/Corporate Communications Department)

1. "This is _____, _____ at
(Name) (Title)
McGuire Nuclear Station. This is/is not a drill. Open your Crisis Management Plan to Figure E-4 for the following message. Do you have that figure?
2. My name is _____. I am the _____ _____(title) at McGuire Nuclear Station and am notifying you of a Notification of Unusual Event condition associated with Unit no.___.
3. The incident occurred at _____(hours) on ___/___/___ (date).
4. The initiating condition for this Notification of Unusual Event is as follows:_____
_____
_____
5. Corrective measures being taken at present are as follows:_____
_____
_____
_____
6. There have/have not been any injuries to plant personnel.
7. Other information on the incident is as follows:_____
_____
_____
_____
8. I can be reached at _____(telephone number) for follow-up information.
9. Do you have any questions?
10. Steam Production/Corporate Communication person notified was:
Steam Production _____.
Corporate Communication _____.
11. I repeat, this is/is not a drill.

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: EP/0/A/5000/06
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Alert

(4) PREPARED BY: M. S. Glover DATE: 7/21/82

(5) REVIEWED BY: [signature] DATE: 7-29-82

Cross-Disciplinary Review By: _____ N/R ~~X~~

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: [signature] Date: 7-30-82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY

McGUIRE NUCLEAR STATION

ALERT

1.0 Symptoms

1.1 Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant.

2.0 Immediate Action

2.1 Automatic

None

2.2 Manual

2.2.1 The Shift Supervisor shall be informed of all events initiating this procedure.

3.0 Subsequent Actions

Initial / N/A

_____/____ 3.1 The Shift Supervisor shall assure that the appropriate emergency condition is declared by comparing the Emergency Action Level(s) and Initiating Conditions (s) listed in Enclosure 4.1 to those of the actual plant condition.

_____/____ 3.2 The Shift Supervisor shall ensure that all actions required by the initiating Emergency Procedure will be performed and that all actions necessary for the protection of persons and property are being taken.

NOTE

If at any time in the course of events in this procedure, site evacuation or personnel assembly/accountablility appears necessary, refer to Station Directive 3.8.1.

_____/____ 3.3 The Shift Supervisor shall assume the function of the Emergency Coordinator until the arrival of the Station Manager or his designee, at which time the Station Manager or his designee assumes the responsibility of the Emergency Coordinator.

_____/____ 3.4 The Emergency Coordinator shall assure prompt (within 15 minutes of declaring the emergency for State and Local authorities) notification of those personnel, and Warning Points and shall activate those Emergency Centers indicated on Enclosure 4.2 for the appropriate Initiating Condition/Emergency Procedure list i in Enclosure 4.1.

NOTE 1

Activation of the Technical Support Center (TSC), and Operations Support Center (OSC) shall be in accordance with Station Directive 3.8.2. Activation of the Crisis Management Center (CMC) shall be in accordance with Enclosure 4.5.

NOTE 2

See Enclosure 4.3, Telephone Listing, for notification, telephone numbers/radio codes/pager codes.

NOTE 3

See Enclosure 4.4, Notification of Emergency Conditions, for information to be provided to State/County Warning Points.

____/____ 3.5 The Emergency Coordinator in direct contact with the Technical Support Center and the Crisis Management Center will assess and respond to the emergency by:

3.5.1 Dispatching onsite monitoring teams with associated communications equipment.

3.5.2 Providing periodic plant status updates to offsite authorities (at least every 15 minutes).

3.5.3 Providing periodic meteorological assessments to offsite authorities and, if any releases are occurring, dose estimates for actual releases.

NOTE

In the event a release or potential release of radioactive materials is a threat to plant personnel or members of the general public, the Emergency Coordinator shall request Health Physics personnel to evaluate the consequences utilizing the appropriate Health Physics procedure, HP/O/B/1009/05, HP/O/B/1009/06, HP/O/B/1009/08, HP/O/B/1009/09, or HP/O/B/1009/10.

____/____ 3.6 The Emergency Coordinator shall provide protective action recommendations as necessary to the affected county warning point(s) and to the North Carolina warning point (Emergency Operations Centers if established) or to the state Radiological Protection

Section, Department of Human Resources (See Enclosure 4.3, Telephone Listing) as directed by the state in accordance with the North Carolina Radiological Emergency response plan. If evaluation indicates that a potential for or an actual release of radioactive materials will result in a projected dose (REM) to the population of: (EPA Protective Action Guidelines).

3.6.1 Whole body <1, thyroid <5, NO protective action is required. Monitor environmental radiation levels to verify.

3.6.2 Whole body 1 to <5, thyroid 5 to <25, recommend seeking shelter and wait for further instructions. Consider evacuation particularly for children and pregnant women. Monitor environmental radiation levels. Control access to affected areas.

3.6.3 Whole body 5 and above, thyroid 25 and above, recommend mandatory evacuation of populations in the affected areas. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.

NOTE

See Enclosure 4.3 for Telephone Listing for notification.

_____/____ 3.7 The Emergency Coordinator in coordination with the Recovery Manager at the Crisis Management Center, will assess the emergency condition and determine the need to remain in an Alert Status, escalate to a more severe class, reduce the emergency class or close out the emergency.

_____/____ 3.8 The Station Manager or his designee will close out the Emergency with a verbal summary to County and State authorities notified in Step 3.4, followed by a written summary within 8 hours.

4.0 Enclosures

4.1 List of Initiating Conditions, Emergency Action Levels, and Associated Emergency Procedure/Document.

4.2 Notification Chart.

4.3 Telephone Listing.

4.4 Notification of Emergency Conditions.

4.5 Crisis Management Center Activation Format.

LIST OF INITIATING CONDITIONS, EMERGENCY ACTION LEVELS, AND ASSOCIATED EMERGENCY PROCEDURE/DOCUMENT

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.1	Severe loss of fuel cladding:	a. Very high coolant activity sample (e.g., 300 µCi/cc equivalent of I-131)	
		b. Failed fuel monitor (EMF-48) or lab analysis indicates increase greater than 1% fuel failures within 30 minutes or 5% total fuel failure.	Tech Specs 3/4.6.7
4.1.2	Rapid gross failure of one Steam Generator tube with loss of offsite power.	Pressurizer low pressure alarm and reactor trip and, pressurizer low level alarm and, pressurizer low pressure safety injection signal and, undervoltage alarm on 7KV buses. EMF 32, 33, and 34 Alarm(s).	EP/1/A/5000/04, AP/1/A/5500/07
4.1.3	Rapid failure of Steam Generator tubes.	Several hundred gpm primary to secondary leak rate indicated by:	EP/1/A/5000/04
		a. as above in 4.1.2 for pressurizer and EMF indicators.	
		b. Steam generator level increasing in one or more generator(s) and falling in the others/due to reactor trip.	

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.4	Steam line break with significant primary to secondary leak rate.	Greater than 10gpm, rapidly decreasing reactor coolant Tavg, pressurizer pressure and level and, 1. Steam line differential pressure safety injection signal and increased containment building pressure/ if break is in containment. 2. High steam flow and Lo Lo Tavg or Low steam pressure safety injection signal for rupture downstream of MSIV's.	EP/1/A/5000/04, EP/1/A/5000/03
4.1.5	Primary coolant leak rate greater than 50 gpm.	Leak >50gpm as indicated by calculation or other indication. (i.e., sump levels)	EP/1/A/5000/02, AP/1/A/5500/10
4.1.6	High radiation levels or high airborne contamination which indicates a severe degradation in the control of radioactive materials.	Increase by a factor of 1,000 in radiation monitor reading within the station.	HP/0/B/1009/05
4.1.7	Loss of offsite power and loss of all onsite AC power for up to 15 minutes. (See Site Area Emergency EP/0/A/5000/07, for extended loss).	Undervoltage alarm on 7KV buses, and blackout load sequencers actuated.	AP/1/A/5500/07
4.1.8	Loss of all onsite DC power.	DC bus undervoltage alarms on all buses.	Tech Specs 3/4.8.2.3, Tech Specs 3/4.8.2.4
4.1.9	Coolant pump seizure leading to fuel failure.	Reactor coolant pump auto trip alarm, and reactor trip on low coolant flow, and failed fuel monitor alarm EMF48.	AP/1/A/5500/04, AP/1/A/5500/08, OP/0/A/6150/14, AP/1/A/5500/05

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.10	Complete loss of functions needed for plant cold shutdown.	RHR not functional and inability to sustain natural or forced circulation.	AP/1/A/5500/17, OP/1/A/6100/04
4.1.11	Failure of the reactor protection system to initiate and complete a scram which brings the reactor subcritical.	Reactor remains critical after all attempts to trip reactor have been completed.	AP/0/A/5500/34
4.1.12	Fuel damage accident with release of radioactivity to containment or fuel handling building.	Observation of damage to spent fuel assembly, and 1. EMF-16 and 17 alarm. 2. EMF-38, 39, 40, or 42 alarm.	AP/1/A/5500/25
4.1.13	Fire potentially affecting safety systems.	Observation of a fire that could affect safety systems.	Station Directive 2.11 Series, Tech Specs 3/4.5
4.1.14	Most or all alarms (annunciators) lost.	As observed.	OP/0/A/6350/01A
4.1.15	Radiological effluents greater than 10 times Tech Specs instantaneous limits (an instantaneous rate which, if continued over 2 hours, would result in about 1mr at the site boundary under average meteorological conditions or whenever effluent monitors or radiological monitoring detect these levels).	For EMF35 - Low Range offscale High Range 1 x 10^4 cpm For EMF36 - Low Range 2 x 10^6 cpm High Range 5 x 10^2 cpm	HP/0/B/1009/05
4.1.16	Ongoing security compromise.	As reported by Security force.	Station Security Plan

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.17	Severe natural phenomona being experienced or projected:		AP/0/A/5500/30, AP/0/A/5500/29
	a. Earthquake greater than Operational Basis Earthquake Levels	>0.08gH, >.053gV, Annunciator Alarm, (AD-13).	
	b. Flood, low water, hurricane surge, seiche near design levels. (Lake tidal wave)	As observed.	
	c. Any tornado striking facility.	As observed.	
	d. Hurricane winds near design basis level.	As observed (95 mph)/from National Weather Service information.	
4.1.18	Other hazards being experienced or projected.		AP/0/A/5500/32, AP/0/A/5500/31 AP/1/A/5500/23
	a. Aircraft crash on facility.	As observed.	
	b. Missile impacts from whatever source on facility.	As observed.	
	c. Know explosion damage to facility affecting plant operation.	As observed.	
	d. Entry into facility environs of toxic or flammable gases.	As observed.	
	e. Turbine failure causing casing penetration.	Turbine trip and observation of turbine malfunction or failure.	

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.19	Other plant conditions exist that in the judgement of the Shift Supervisor, the Operations Duty Engineer, the Superintendent of Operations, or the Plant Manager warrant precautionary activation of the Technical Support Center and near site Crisis Management Center.	As determined by Shift Supervisor/ Emergency Coordinator.	As dictated by Plant Conditions.
4.1.20	Evacuation of control room anticipated or required with control of shutdown systems established from local station.	As determined by Shift Supervisor/ Emergency Coordinator.	AP/1/A/5500/17, OP/1/A/6100/04

NOTIFICATION/ACTIVATION
ALERT

Notify/Activate the following personnel/or Emergency Centers for all Initiating Conditions listed in Enclosure 4.1. (See Enclosure 4.3 for Telephone Listing)

NOTIFY/ACTIVATE	NOTIFICATION COMPLETE-INITIAL
Shift Supervisor	
Operations Duty Engineer	
Station Manager	
Superintendent of Operations	
Superintendent of Technical Services	
Projects and Licensing Engineer	
Station Health Physicist	
North Carolina State Warning Point	
Mecklenburg County Warning Point	
Lincoln County Warning Point	
Catawba County Warning Point	
Iredell County Warning Point	
Gaston County Warning Point	
Cabarrus County Warning Point	
N.R.C. via ENS (Red Phone)	
N.R.C. Station Representative	
Construction Project Manager	
Superintendent of Maintenance	
Superintendent of Administration	
Activate T.S.C. (Station Directive 3.8.2)	
Activate O.S.C. (Station Directive 3.8.2)	
Activate C.M.C. (Enclosure 4.3, Enclosure 4.5)	

TELEPHONE LISTING

4.3.1 Operations Duty Engineer (PA System)
P&T Pager -

4.3.2 Station Manager
Home - - System Speed - 12
Home - - System Speed - 11

4.3.3 Superintendent of Operations -
Home - - System Speed - 13

4.3.4 Superintendent of Technical Services -
Home - - System Speed - 14

4.3.5 Projects and Licensing Engineer -
Home - - System Speed - 32

4.3.6 Station Health Physicist -
Home - - System Speed - 31
P&T Pager

4.3.7 NC State Warning Point, Raleigh - - System Speed - 41

4.3.8 Mecklenburg County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 42
Back-up: Emergency Radio, Code: 21

4.3.9 Lincoln County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 43
Back-up: Emergency Radio, Code: 25

4.3.10 Catawba County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 44
Back-up: Emergency Radio, Code: 27

4.3.11 Iredell County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 45
Back-up: Emergency Radio, Code: 23

4.3.12 Gaston County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 46
Back-up: Emergency Radio, Code: 26

4.3.13 Cabarrus County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 47
Back-up: Emergency Radio, Code: 28

NOTE

Radio Code 20 will activate
all county radio units.

TELEPHONE LIST

4.3.14 N.R.C. Operation Center, Emergency Notification System (ENS Phone)

4.3.15 N.R.C. Station Representative
Office
Home - System Speed - 57
Wife work - System Speed - 58
P&T Pager

4.3.16 Construction Project Manager Construction
Home : System Speed - 17 or
- System Speed - 18

4.3.17 Superintendent of Maintenance
Home - - System Speed - 15

4.3.18 Superintendent of Administration
Home - System Speed - 16

4.3.19 CRISIS MANAGEMENT CENTER ACTIVATION

Hal B. Tucker Office:
or Home: - System Speed - 53

J. Ed Smith Office: Extension
or Home: - System Speed - 54

J. W. Hampton Office: Extension
or Home: - System Speed - 55

R. W. Bostian Office:
or Home: System Speed - 56

Steam Production Duty Man - System Speed - 51

4.3.20 Radiation Protection Section, Department of Human Resources-
- System Speed - 48

MCGUIRE NUCLEAR STATION
NOTIFICATION OF EMERGENCY CONDITIONS

4.4.1 Include as a minimum, the following information to the North Carolina State Warning Point, and to the six County Warning Points, (Mecklenburg, Catawba, Iredell, Lincoln, Gaston, and Cabarrus).

NOTE 1: See Enclosure 4.3, Telephone Listing

NOTE 2: A. Complete Part I of this format as a minimal first notification of a reportable incident.

B. Complete Part I and II of this format to provide minimal followup information.

PART I: Initial Emergency Message Information

"This is _____, _____,
(Name) (Title)
at McGuire Nuclear Station. I am notifying you of an incident at McGuire, Unit # _____. Please acknowledge when you are ready to copy emergency information."

1. This is McGuire Nuclear Station.
2. My name is _____.
3. This message (Number ___)
   _____ a. Reports a real emergency.
   _____ b. Is an exercise message.
4. My telephone number is _____.
5. Message Authentication: _____.
6. The class of emergency is:
   _____ a. Notification of an Unusual Event
   _____ b. Alert
   _____ c. Site Area Emergency
   _____ d. General Emergency
7. The Classification of Emergency was declared at: _____ on
   (A.M./P.M.)
   _____.
   (Date)

✓	ACKNOWLEDGEMENT
____	Mecklenburg
____	Gaston
____	Iredell
____	Lincoln
____	Cabarrus
____	Catawba

8. The initiating event causing the Emergency Classification is:

_____

_____

_____

9. The Emergency Condition (Select one of the below options):

_____ a. Does not involve the release of radioactive materials from the plant.

_____ b. Involves the POTENTIAL for arelease of but NO release is occurring.

_____ c. Involves a release of radioactive material.

10. We recommend the following protective action: (select one of the below options)

_____ a. No protective action is recommended at this time.

_____ b. People living in zones _____ remain indoors with doors and windows closed.

_____ c. People in zones _____ EVACUATE their homes and businesses.

_____ d. Pregnant women and children in zones _____ remain indoors with the doors and windows closed.

_____ e. Pregnant women and children in zones _____ evacuate to the nearest shelter/reception center.

_____ f. Other recommendations: _____

_____

_____

_____

11. There will be:

_____ a. A followup message

_____ b. No further communications

12. I repeat, this message:

_____ a. Reports an actual emergency.

_____ b. Is an exercise message.

13. Relay this information to the persons indicated in your alert procedures for an incident at McGuire Nuclear Station.

NOTE: Record the Name, Title, Date, Time, and Warning Point at end of Part II.

PART II: Followup Emergency Message Information

1. The type of actual or projected release is:

   _____ a. Airborne

   _____ b. Waterborne

   _____ c. Surface spill

   _____ d. Other

2. The source and description of the release is: _____

   _____

   _____

3. _____ a. Release began/will begin at _____a.m./p.m.; time since reactor trip is _____ hours.

   _____ b. The estimated duration of the release is _____ hours.

4. Dose projection base data:

   Radiological release: _____curies, or _____curies/sec.

   Windspeed: _____mph

   Wind direction: From ____°

   Stability class: _____(A,B,C,D,E,F, or G)

   Release height: _____Ft.

   Dose conversion factor: _____R/hr/Ci/M^3 (whole body)

   _____R/hr/Ci/M^3 (Child Thyroid)

   Precipitation _____

   Temperature at the site: _____°F

5. Dose projections:

Dose Commitment

Distance	Whole Body Rem/hour	(Child Thyroid) Rem/hour of inhalation
Site boundary		
2 miles		
5 miles		
10 miles		

Projected Integrated Dose In Rem

Distance	Whole Body	Child Thyroid
Site Boundary		
2 miles		
5 miles		
10 miles		

6. Field measurement of dose rate or contamination (if available):

_____

_____

7. Emergency actions underway at the facility include: _____

_____

8. Onsite support needed from offsite organizations: _____

_____

9. Plant status:
   a. Reactor is: not tripped/tripped
   b. Plant is at: ___% power/hot shutdown/cold shutdown/cooling down
   c. Prognosis is: stable/improving/degrading/unknown.
10. I repeat, this message:
   ____ a. Reports an actual emergency.
   ____ b. Is an exercise message.
11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

NOTE: Record the name, title, date, time, and warning point notified.

(1) _____ Communicator
(Name) (Title)

_____ Mecklenburg
(Date) (Time) (Warning Point)

(2) _____ Communicator
(Name) (Title)

_____ Gaston
(Date) (Time) (Warning Point)

(3) _____ Communicator
(Name) (Title)

_____ Iredell
(Date) (Time) (Warning Point)

(4) _____ Communicator
(Name) (Title)

_____ Catawba
(Date) (Time) (Warning Point)

(5) _____ Communicator
(Name) (Title)

_____ Lincoln
(Date) (Time) (Warning Point)

(6) _____ Communicator
(Name) (Title)

_____ Cabarrus
(Date) (Time) (Warning Point)

(7) _____ Communicator
(Name) (Title)

_____ North Carolina
(Date) (Time) (Warning Point)

CRISIS MANAGEMENT CENTER ACTIVATION FORMAT

1. This is _____ at McGuire Nuclear Station. This is/is not a drill. Open your Crisis Management Plan to Figure E-2 for the following message. Do you have that Figure?
2. My name is _____. I am the _____(title) at McGuire Nuclear Station and am notifying you of an incident at McGuire Nuclear Station, Unit No.____.
3. The incident occurred at _____(Hours) on ___/___/___ (Date).
4. The class of emergency is:_____.
5. The initiating condition causing the emergency is as follows: _____

   _____

   _____

   _____
6. Release of radioactivity:____is taking place ____is not taking place.
7. Wind direction (blowing from) _____degrees.
8. Corrective measures being taken at present are as follows:_____

   _____

   _____

   _____
9. It is recommended that you activate the Crisis Management Center in accordance with the Crisis Management Plan.
10. Do you have any questions?
11. I repeat, this is/is not a drill.
12. Record name of person notified, title, and time notified.

    _____

    (Name) (Title) (Time)

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: EP/0/A/5000/07
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Site Area Emergency

(4) PREPARED BY: M. S. Glover DATE: 7/21/82

(5) REVIEWED BY: [signature] DATE: 7-27-82

Cross-Disciplinary Review By: _____ N/R: N/A

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: [signature] Date: 7-30-82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
MCGUIRE NUCLEAR STATION
SITE AREA EMERGENCY

1.0 Symptoms

1.1 Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public.

2.0 Immediate Action

2.1 Automatic

None

2.2 Manual

2.2.1 The Shift Supervisor shall be informed of all events initiating this procedure.

3.0 Subsequent Actions

Initial/N/A

_____/_____ 3.1 The Shift Supervisor shall assure that the appropriate emergency condition is declared by comparing the Emergency Action Level(s) and Initiating Condition(s) listed in Enclosure 4.1 to those of the actual plant condition.

_____/_____ 3.2 The Shift Supervisor shall ensure that all actions required by the initiating Emergency Procedure will be performed and that all actions necessary for the protection of persons and property are being taken.

NOTE

If at any time in the course of events in this procedure, site evacuation or personnel assembly/accountability appears necessary, refer to Station Directive 3.8.1.

_____/_____ 3.3 The Shift Supervisor shall assume the function of the Emergency Coordinator until the arrival of the Station Manager or his designee at which time the Station Manager or his designee assumes the responsibility of the Emergency Coordinator.

___/___ 3.4 The Emergency Coordinator shall assure prompt (within 15 minutes of declaring the emergency for State and Local authorities) notification of those personnel and Warning Points and shall activate those Emergency Centers indicated on Enclosure 4.2 for the appropriate Initiating Condition/Emergency Procedure listed in Enclosure 4.1.

NOTE 1

Activation of the Technical Support Center (TSC), Operations Support Center (OSC), shall be in accordance with Station Directive 3.8.2. Activation of the Crisis Management Center (CMC) shall be in accordance with Enclosure 4.5.

NOTE 2

See Enclosure 4.3, Telephone Listing, for notification, telephone numbers/radio codes/pager codes.

NOTE 3

See Enclsoure 4.4, Notification of Emergency Conditions to be provided to State/County Warning Points.

___/___ 3.5 The Emergency Coordinator in direct contact with the Technical Support Center and the Crisis Management Center will assess and respond to the emergency by:

3.5.1 Dispatching the Onsite and Offsite Monitoring teams with associated communications.

3.5.2 Providing meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual or automated data transmission.

3.5.3 Providing release and dose projections based on available plant condition information and foreseeable contingencies to offsite authorities.

NOTE

In the event a release or potential release of radioactive materials is a threat to plant personnel or members of the general public, the Emergency Coordinator shall request Health Physics personnel to evaluate the consequences utilizing the appropriate Health Physics procedure, HP/O/B/1009/05, HP/O/B/1009/06, HP/O/B/1009/08, HP/O/B/1009/09, HP/O/B/1009/10.

/ 3.6 The Emergency Coordinator shall provide protective action recommendations as necessary to the affected county warning point(s) and to the North Carolina Warning Point (Emergency Operations Centers if established) or the Radiological Protection Section, Department of Human Resources (see Enclosure 4.3, Telephone Listing) as directed by the state in accordance with the North Carolina Radiological Emergency response plan. If evaluation indicates that a potential for or an actual release of radioactive materials will result in a projected dose (REM) to the population of: (EPA Protective Action Guidelines).

3.6.1 Whole body <1, thyroid <5, NO protective action is required. Monitor environmental radiation levels to verify.

3.6.2 Whole body 1 to <5, thyroid 5 to <25, recommend seeking shelter and wait for further instructions, consider evacuation particularly for children and pregnant women. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.

3.6.3 Whole body 5 and above, thyroid 25 and above, recommend mandatory evaucation of populations in the affected areas. Monitor environmental radiation levels and adjust area for mandatory evacuation based on these levels. Control access to affected areas.

NOTE

See Enclosure 4.3, Telephone Listing for notification.

/ 3.7 The Emergency Coordinator in coordination with the Recovery Manager, at the Crisis Management Center, will provide or make available:

3.7.1 A dedicated individual for plant status updates to offsite authorities and periodic press briefings.

3.7.2 Senior technical and management staff onsite available for consulation with the NRC and State on a periodic basis.

/ 3.8 The Emergency Coordinator in coordination with Recovery Manager at the Crisis Management Center, will assess the emergency condition and determine the need to remain in a Site Area Emergency, escalate to a more severe class, reduce the emergency class, or close out the emergency.

/ 3.9 The Recovery Manager at the Crisis Management Center will close out or recommend reduction of the emergency class, by briefing of offsite authorities at the Crisis Management Center or by phone if necessary, followed by written summary within 8 hours.

4.0 Enclosures

4.1 List of Initiating Conditions, Emergency Action Levels, and Associated Emergency Procedure/Document.

4.2 Notification Chart.

4.3 Telephone Listing.

4.4 Notification of Emergency Conditions.

4.5 Crisis Management Center Activation Format.

LIST OF INITIATING CONDITIONS, EMERGENCY ACTION LEVELS, AND
ASSOCIATED EMERGENCY PROCEDURE/DOCUMENT

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.1	Known loss of coolant accident greater than makeup pump capacity.	Pressurizer low pressure reactor trip and pressurizer low pressure safety injection signal and high containment building pressure, (INSP5040, 5050, 5060, 5070) and high containment building sump level, (INIP5260, 5270) and high containment humidity, (INSP5400, 5410) and EMF 38, 39, and 40 alarm.	EP/1/A/5000/02
4.1.2	Degraded core with possible loss of coolable geometry (indicators should include instrumentation to detect inadequate core cooling, coolant activity and/or containment radioactivity levels).	Valid readings on incore thermocouples above 700°F and ΔT rapidly increasing or no ΔT across core.	AP/1/A/5500/05
4.1.3	Rapid failure of steam generator tubes with loss of offsite power (e.g., several hundred gpm primary to secondary leak rate).	Pressurizer low pressure alarm and reactor trip, and pressurizer low level alarm, and EMF 32, 33, and 34 alarm, and undervoltage alarms on 7KV buses, and steam generator water level rapidly increasing in one or more steam generators falling in the others, and pressurizer level rapidly decreasing, (INCP5151, 5160, 5172) and possible lifting of steam generator PRV's and/or safety valves.	EP/1/A/5000/04, AP/1/A/5500/07

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.4	Steam line break with greater than 50gpm primary to secondary leakage and indication of fuel damage.	Rapidly decreasing reactor coolant Tavg, pressurizer pressure and level. Steam line differential pressure safety injection signal, and High containment building pressure, if steamline break is in containment (INSP5040, 5050, 5060, 5070) and EMF 51A and/or B alarm, or high steam flow and Lo Lo Tavg or low steam pressure safety injection signal, and EMF 48 alarm.	EP/1/A/5000/03
4.1.5	Loss of offsite power and loss of onsite AC power for more than 15 minutes.	Undervoltage alarms on 7KV buses.	AP/1/A/5500/07
4.1.6	Loss of all vital onsite DC power for more than 15 minutes.	Blackout load sequencers actuated, DC bus undervoltage all buses and indications as in 4.1.5 above.	Tech Specs 3/8.2.3, 3/8.2.4
4.1.7	Complete loss of any function needed for plant hot shutdown.	Inability to establish charging pump injection, and Inability to establish emergency feedwater flow, or Inability to establish service water flow, and Inability to establish component cooling water flow.	OP/1/A/6100/04, AP/1/A/5500/17
4.1.8	Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident).	Reactor remains critical after all attempts to trip reactor have been completed.	EP/1/A/5000/01, AP/0/A/5500/34
4.1.9	Major damage to spent fuel in containment or fuel handling building (e.g., large object damages fuel or water loss below fuel level).	Observation of major damage to one or more spent fuel assemblies, or spent fuel pool water below fuel level, or EMF16, 17, 38, 39, 40, or 42 alarm.	AP/1/A/5500/25

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.10	Fire compromising the function of safety systems.	Observation of a major fire that defeats redundant safety system or function.	Tech Specs 3/4.5, Station Directive 2.11 Series
4.1.11	Most or all alarms (annunciators) lost and plant transient initiated or in progress.	As determined by the Shift Supervisor/ Emergency Coordinator.	OP/0/A/6350/01A
4.1.12	Effluent monitors detect levels corresponding to greater than 50 mr/hr for 1/2 hour or greater than 500 mr/hr W.B. for two minutes (or five times these levels to the thyroid) at the site boundary for adverse meteorology (See Note 2).	For EMF35 Low Range, offscale High Range 8×10^3 cpm. (See Note 1) For EMF36 Low Range 3×10^5 cpm High Range 7×10^1 cpm (See Note 1) For EMF37 Change of 143 cpm/minute for 30 minutes or a change of 1430 cpm/minute for 2 minutes (See Note 1).	HP/0/B/1009/05, HP/0/B/1009/09

NOTE 1: These values are worst case calculations and may not reflect more favorable weather conditions.

NOTE 2: These dose rates are projected based on other plant parameters (e.g., radiation level in containment with leak rate appropriate for existing containment pressure) or are measured in the environs. (EPA Protective Action Guidelines are projected to be exceeded outside the site boundary).

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.13	Imminent loss of physical control of plant.	Physical attack on the plant involving imminent occupancy of control room and auxiliary shutdown panels.	Station Security Plan
4.1.14	Severe natural phenomena being experienced or projected with plant not in cold shutdown.		AP/0/A/5500/29, AP/0/A/5500/30
	4.1.14.1		
	Earthquake greater than SSE (Safe Shutdown Earthquake) levels.	(>.15gH, >.1gV) as determined by monitoring seismic instrumentation and recording devices. (SMP-1)	
	4.1.14.2		
	Flood, low water, hurricane surge, seiche greater than design levels (lake tidal waves) or failure of protection of vital equipment at lower levels.	As determined by Shift Supervisor/ Emergency Coordinator.	
	4.1.14.3		
	Sustained winds or tornadoes in excess of design levels.	(>95mph) as observed or documented by the National Weather Service Information.	
4.1.15	Other hazards being experienced or projected with plant not in cold shutdown.		AP/0/A/5500/32, AP/0/A/5500/31

	Initiating Conditions	Emergency Action Level (EAL)	Emergency Procedure/Document
	4.1.15.1		
	Aircraft crash affecting vital structures by impact or fire.	Aircraft crash causing damage or fire to: Containment Building, Control Room, Auxiliary Building, Fuel Building, or Intake Structure.	
	4.1.15.2		
	Severe damage to safe shutdown equipment from missiles or expolsion.	Loss of functions needed for hot shutdown as in 4.1.7.	
	4.1.15.3		
	Entry of uncontrolled flammable gases into vital areas. Entry of uncontrolled toxic gases into vital areas where lack of access to the area constitutes a safety problem.	Entry of uncontrolled or toxic or flammable gases into: Control Room, Cable Spreading Room, Containment Building, Switchgear Room, Safe Shutdown Panels or Diesel Rooms.	
4.1.16	Other plant conditions exist that in the judgement of the Shift Supervisor, the Operations Duty Engineer, the Superintendent of Operations, or the Plant Manager warrant activation of emergency centers and monitoring teams and a precautionary public notification to the public near the site.	As determined by Shift Supervisor/ Emergency Coordinator.	As dictated by Plant Conditions.

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.17	Evacuation of control room and control of shut-down systems not established from local stations in 15 minutes.	As determined by Shift Supervisor/	OP/0/A/6350/02, AP/1/A/5500/17

NOTIFICATION/ACTIVATION
GENERAL EMERGENCY

Notify/Activate the following personnel/or Emergency Centers for all Initiating Conditions listed in Enclosure 4.1. (See Enclosure 4.3 for Telephone Listing)

NOTIFY/ACTIVATE	NOTIFICATION COMPLETE-INITIAL
Shift Supervisor	
Operations Duty Engineer	
Station Manager	
Superintendent of Operations	
Superintendent of Technical Services	
Projects and Licensing Engineer	
Station Health Physicist	
North Carolina State Warning Point	
Mecklenburg County Warning Point	
Lincoln County Warning Point	
Catawba County Warning Point	
Iredell County Warning Point	
Gaston County Warning Point	
Cabarrus County Warning Point	
South Carolina State Warning Point	
N.R.C. via ENS (Red Phone)	
N.R.C. Station Representative	
Superintendent of Maintenance	
Superintendent of Administration	
Construction Project Manager	
Activate T.S.C. (Station Directive 3.8.2)	
Activate O.S.C. (Station Directive 3.8.2)	
Activate C.M.C. (Enclosure 4.3, Enclosure 4.5)	

TELEPHONE LISTING

4.3.1 Operations Duty Engineer (PA System)
P&T Pager -

4.3.2 Station Manager
Home - - System Speed - 12
Home - - System Speed - 11

4.3.3 Superintendent of Operations -
Home - - System Speed - 13

4.3.4 Superintendent of Technical Services -
Home - - System Speed - 14

4.3.5 Projects and Licensing Engineer -
Home - - System Speed - 32

4.3.6 Station Health Physicist -
Home - - System Speed - 31
P&T Pager

4.3.7 NC State Warning Point, Raleigh - - System Speed - 41

4.3.8 Mecklenburg County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 42
Back-up: Emergency Radio, Code: 21

4.3.9 Lincoln County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 43
Back-up: Emergency Radio, Code: 25

4.3.10 Catawba County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 44
Back-up: Emergency Radio, Code: 27

4.3.11 Iredell County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 45
Back-up: Emergency Radio, Code: 23

4.3.12 Gaston County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 46
Back-up: Emergency Radio, Code: 26

4.3.13 Cabarrus County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 47
Back-up: Emergency Radio, Code: 28

NOTE

Radio Code 20 will activate
all county radio units.

TELEPHONE LIST

4.3.14 SC State Warning Point -

4.3.15 N.R.C. Operation Center, Emergency Notification System (ENS Phone)

4.3.16 N.R.C. Station Representative
Office -
Home - System Speed - 57
Wife work System Speed - 58
P&T Pager

4.3.17 Construction Project Manager Construction
Home : System Speed - 17 or
System Speed - 18

4.3.18 Superintendent of Maintenance
Home - System Speed - 15

4.3.19 Superintendent of Administration
Home - - System Speed - 16

4.3.20 CRISIS MANAGEMENT CENTER ACTIVATION

Hal B. Tucker Office:
or Home: - System Speed - 53

J. Ed Smith Office: Extension
or Home: - System Speed - 54

J. W. Hampton Office: Extension
or Home: - System Speed - 55

R. W. Bostian Office:
or Home: - System Speed - 56

Steam Production Duty Man - - System Speed - 51

4.3.21 Radiation Protection Section, Department of Human Resources-
System Speed - 48

MCGUIRE NUCLEAR STATION
NOTIFICATION OF EMERGENCY CONDITIONS

4.4.1 Include as a minimum, the following information to the North Carolina State Warning Point, the six County Warning Points, (Mecklenburg, Catawba, Iredell, Lincoln, Gaston, and Cabarrus) and the South Carolina Warning Point.

NOTE 1: See Enclosure 4.3, Telephone Listing

NOTE 2: A. Complete Part I of this format as a minimal first notification of a reportable incident.

B. Complete Part I and II of this format to provide minimal followup information.

PART I: Initial Emergency Message Information

"This is _____, _____,
(Name) (Title)
at McGuire Nuclear Station. I am notifying you of an incident at McGuire, Unit # _____. Please acknowledge when you are ready to copy emergency information."

1. This is McGuire Nuclear Station.
2. My name is _____.
3. This message (Number ___)
   _____ a. Reports a real emergency.
   _____ b. Is an exercise message.
4. My telephone number is _____.
5. Message Authentication: _____.
6. The class of emergency is:
   _____ a. Notification of an Unusual Event
   _____ b. Alert
   _____ c. Site Area Emergency
   _____ d. General Emergency
7. The Classification of Emergency was declared at: _____ on
   (A.M./P.M.)
   _____.
   (Date)

✓ ACKNOWLEDGEMENT

Mecklenburg	____
Gaston	____
Iredell	____
Lincoln	____
Cabarrus	____
Catawba	____

8. The initiating event causing the Emergency Classification is:

_____

_____

_____

9. The Emergency Condition (Select one of the below options):

_____ a. Does not involve the release of radioactive materials from the plant.

_____ b. Involves the POTENTIAL for a release of but NO release is occurring.

_____ c. Involves a release of radioactive material.

10. We recommend the following protective action: (select one of the below options)

_____ a. No protective action is recommended at this time.

_____ b. People living in zones _____ remain indoors with doors and windows closed.

_____ c. People in zones _____ EVACUATE their homes and businesses.

_____ d. Pregnant women and children in zones _____ remain indoors with the doors and windows closed.

_____ e. Pregnant women and children in zones _____ evacuate to the nearest shelter/reception center.

_____ f. Other recommendations: _____

_____

_____

_____

11. There will be:

_____ a. A followup message

_____ b. No further communications

12. I repeat, this message:

_____ a. Reports an actual emergency.

_____ b. Is an exercise message.

13. Relay this information to the persons indicated in your alert procedures for an incident at McGuire Nuclear Station.

NOTE: Record the Name, Title, Date, Time, and Warning Point at end of Part II.

PART II: Followup Emergency Message Information

1. The type of actual or projected release is:

   _____ a. Airborne

   _____ b. Waterborne

   _____ c. Surface spill

   _____ d. Other

2. The source and description of the release is: _____

   _____

   _____

3. _____ a. Release began/will begin at _____a.m./p.m.; time since reactor trip is _____ hours.

   _____ b. The estimated duration of the release is _____ hours.

4. Dose projection base data:

   Radiological release: _____curies, or _____curies/sec.

   Windspeed: _____mph

   Wind direction: From ____°

   Stability class: _____(A,B,C,D,E,F, or G)

   Release height: _____Ft.

   Dose conversion factor: _____R/hr/Ci/M^3 (whole body)

   _____R/hr/Ci/M^3 (Child Thyroid)

   Precipitation _____

   Temperature at the site: _____°F

5. Dose projections:

Dose Commitment

Distance	Whole Body Rem/hour	(Child Thyroid) Rem/hour of inhalation
Site boundary		
2 miles		
5 miles		
10 miles		

Projected Integrated Dose In Rem

Distance	Whole Body	Child Thyroid
Site Boundary		
2 miles		
5 miles		
10 miles		

6. Field measurement of dose rate or contamination (if available):

_____

_____

7. Emergency actions underway at the facility include: _____

_____

8. Onsite support needed from offsite organizations: _____

_____

9. Plant status:
   a. Reactor is: not tripped/tripped
   b. Plant is at: ___% power/hot shutdown/cold shutdown/cooling down
   c. Prognosis is: stable/improving/degrading/unknown.
10. I repeat, this message:
   ____ a. Reports an actual emergency.
   ____ b. Is an exercise message.
11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

NOTE: Record the name, title, date, time, and warning point notified.

(1) _____ (Name) Communicator (Title)

_____ (Date) (Time) Mecklenburg (Warning Point)

(2) _____ (Name) Communicator (Title)

_____ (Date) (Time) Gaston (Warning Point)

(3) _____ (Name) Communicator (Title)

_____ (Date) (Time) Iredell (Warning Point)

(4) _____ (Name) Communicator (Title)

_____ (Date) (Time) Catawba (Warning Point)

(5) _____ (Name) Communicator (Title)

_____ (Date) (Time) Lincoln (Warning Point)

(6) _____ (Name) Communicator (Title)

_____ (Date) (Time) Cabarrus (Warning Point)

(7) _____ (Name) Communicator (Title)

_____ (Date) (Time) North Carolina (Warning Point)

(8) _____ (Name) Communicator (Title)

_____ (Date) (Time) South Carolina (Warning Point)

CRISIS MANAGEMENT CENTER ACTIVATION FORMAT

1. This is _____ at McGuire Nuclear Station. This is/is not a drill. Open your Crisis Management Plan to Figure E-2 for the following message. Do you have that Figure?
2. My name is _____. I am the _____(title) at McGuire Nuclear Station and am notifying you of an incident at McGuire Nuclear Station, Unit No.____.
3. The incident occurred at _____(Hours) on ___/___/___ (Date).
4. The class of emergency is:_____.
5. The initiating condition causing the emergency is as follows: _____

   _____

   _____

   _____
6. Release of radioactivity:____is taking place ____is not taking place.
7. Wind direction (blowing from) _____degrees.
8. Corrective measures being taken at present are as follows:_____

   _____

   _____

   _____
9. It is recommended that you activate the Crisis Management Center in accordance with the Crisis Management Plan.
10. Do you have any questions?
11. I repeat, this is/is not a drill.
12. Record name of person notified, title, and time notified.

    _____

    (Name) (Title) (Time)

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: EP/0/A/5000/08
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: General Emergency

(4) PREPARED BY: M. S. Glover DATE: 7/21/82

(5) REVIEWED BY: [signature] DATE: 7-29-82

Cross-Disciplinary Review By: _____ N/R: N/A

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: [signature] Date: 7-30-82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
GENERAL EMERGENCY

1.0 Symptoms

1.1 Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity.

2.0 Immediate Action

2.1 Automatic

None

2.2 Manual

2.2.1 The Shift Supervisor shall be informed of all events initiating this procedure.

3.0 Subsequent Actions

Initial/N/A

_____/_____ 3.1 The Shift Supervisor shall assure that the appropriate emergency condition is declared by comparing the Emergency Action Level(s) and Initiating Condition(s) listed in Enclosure 4.1 to those of the actual plant condition.

_____/_____ 3.2 The Shift Supervisor shall ensure that all actions required by the initiating Emergency Procedure will be performed and that all actions necessary for the protection of persons and property are being taken.

NOTE

If at any time in the course of events in this procedure, site evacuation or personnel assembly/accountability appears necessary, refer to Station Directive 3.8.1.

_____/_____ 3.3 The Shift Supervisor shall assume the function of the Emergency Coordinator until the arrival of the Station Manager or his designee, at which time the Station Manager or his designee assumes the responsibility of the Emergency Coordinator.

/ 3.4 The Emergency Coordinator shall assure prompt (within 15 minutes of declaring the emergency for State and Local authorities) notification of those personnel and Warning Points and shall activate those Emergency Centers indicated on Enclosure 4.2 for the appropriate Initiating Condition/Emergency Procedure listed in Enclosure 4.1.

NOTE 1

Activation of the Technical Support Center (TSC) and Operations Support Center (OSC) shall be in accordance with Station Directive 3.8.2. Activation of the Crisis Management Center (CMC) shall be in accordance with Enclosure 4.5.

NOTE 2

See Enclosure 4.3, Telephone Listing, for notification, telephone numbers/radio codes/pager codes.

NOTE 3

See Enclosure 4.4, Notification of Emergency Conditions to be provided to State/County Warning Points.

/ 3.5 The Emergency Coordinator in direct contact with the Technical Support Center and the Crisis Management Center will assess and respond to the emergency by:

3.5.1 Dispatching the onsite and offsite monitoring teams with associated communications.

3.5.2 Provide meteorological and dose estimates to offsite authorities for actual releases via a dedicated individual or automated data transmission.

3.5.3 Provide release and dose projections based on available plant condition information and foreseeable contingencies to offsite authorities.

NOTE

In the event a release or potential release of radioactive materials is a threat to plant personnel or members of the general public, the Emergency Coordinator shall request Health Physics personnel to evaluate the consequences utilizing the appropriate Health Physics procedure, HP/0/B/1009/05, HP/0/B/1009/06, HP/0/B/1009/08, HP/0/B/1009/09, or HP/0/B/1009/10.

____/____ 3.6 The Emergency Coordinator shall provide protective action recommendations as necessary to the affected county warning point(s) and to the North Carolina Warning Point (Emergency Operations Centers if established) or to state Radiological Protection Section, Department of Human Resources (See Enclosure 4.3, Telephone Listing) as directed by the state in accordance with the North Carolina Radiological Emergency Response Plan. If evaluation indicates that a potential for an actual release of radioactive materials will result in a projected dose (REM) to the population of: (EPA Protective Action Guidelines)

3.6.1 Whole body <1, Thyroid <5, No protective action is required. Monitor environmental radiation levels to verify.

3.6.2 Whole body 1 to <5, Thyroid 5 to <25, recommend seeking shelter and wait for further instructions. Consider evacuation particularly for children and pregnant women. Monitor environmental radiation levels. Control access to affected areas.

3.6.3 Whole body 5 and above, Thyroid 25 and above, recommend mandatory evacuation of populations in the affected areas. Monitor environmental radiation levels and adjust area for Mandatory evacuation based on these levels. Control access to affected areas.

NOTE

See Enclosure 4.3 Telephone Listing for notification.

____/____ 3.7 The Emergency Coordinator in coordination with the Recovery Manager, at the Crisis Management Center, will provide or make available:

3.7.1 A dedicated individual for plant status updates to offsite authorities and periodic press briefings.

3.7.2 Senior technical and managment staff onsite available for consultation with the NRC and State on a periodic basis.

___/___ 3.8 The Emergency Coordinator in coordination with the Recovery Manager at the Crisis Management Center will assess the emergency condition and determine the need to remain in a General Emergency, reduce the emergency class, or close out the emergency.

___/___ 3.9 The Recovery Manager at the Crisis Management Center will close out the emergency or recommend reduction of the Emergency class by briefing the offsite authorities at the Crisis Management Center or by phone if necessary, followed by written summary within 8 hours.

4.0 Enclosures

4.1 List of Initiating Conditions, Emergency Action Levels, and Associated Emergency Procedure/Document.

4.2 Notification Chart.

4.3 Telephone listing.

4.4 Notification of Emergency Conditions.

4.5 Crisis Management Center Activation Format.

LIST OF INITIATING CONDITIONS, EMERGENCY ACTION LEVELS, AND ASSOCIATED EMERGENCY PROCEDURE/DOCUMENT

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.1	Effluent monitors detect levels corresponding to 1 rem/hr Whole Body or 5 rem/hr Thyroid at the site boundary under actual meteorological conditions. NOTE 1: These dose rates are projected base on plant parameters (e.g., radiation levels in containment with leak rate appropriate for existing containment pressure with some confirmation from effluent monitors) or are measured in the environs. NOTE 2: Consider evacuation only within about 2 miles of the site boundary unless these levels are exceeded by a factor of 10 or projected to continue for 10 hours or EPA Protective Action Guideline exposure levels are predicted to be exceeded at longer distances.	As observed by control room personnel.	HP/0/B/1009/05
4.1.2	Loss of 2 of 3 fission product barriers with a potential loss of 3rd barrier, (e.g., loss of primary coolant boundary, clad-failure, and high potential for loss of containment intergrity).	1. Loss of coolant accident as identified in Site Area Emergency 4.1.1, and incomplete containment isolation. 2. Loss of coolant accident as identified in Site Area Emergency 4.1.1, and Containment Monitor alarms (EMF51A and/or B) greater than 104R/hr and containment pressure greater than 14.8 psig for at least 2 minutes.	HP/0/B/1009/05, AP/1/A/5500/05

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
4.1.3	Loss of physical control of the facility. NOTE: Consider 2 mile precautionary evacuation.	Physical attack of the facility has resulted in occupation of the control room and auxiliary shutdown facility.	Station Security Plan.
4.1.4	Other plant conditions exist, from whatever source, that in the judgement of the shift supervisor, the Operations Duty Engineer, the Superintendent of Operations, or the Plant Manager make release of large amounts of radioactivity in a short time period possible (e.g., any core melt situation). a. For core melt sequences where significant releases are not yet taking place and large amounts of fission products are not yet in the containment atmosphere, consider 2 mile precautionary evacuation. Consider 5 mile downwind evacuation (45^{o} to 90^{o} sector) if large amounts of fission products (greater than Gap activity) are in the containment atmosphere. Recommend sheltering in other parts of the plume exposure Emergency Planning Zone under this circumstance.	As determined by the Shift Supervisor/ Emergency Coordinator and verified by EAL's defined in Implementing Procedures utilized up to this point.	As dictated by plant conditions.

Initiating Conditions	Emergency Action Level (EAL)	Emergency Procedure/Document
	b. For core melt sequences where significant releases from containment are not yet taking place and containment failure leading to a direct atmospheric release is likely in the sequence but not imminent and large amounts of fission products in addition to noble gases are in the containment atmosphere, consider precautionary evacuation to 5 miles and 10 mile downwind evacuation (45^{o} and 90^{o} sector).	
	c. For core melt sequences where large amounts of fission products other than noble gases are in the containment atmosphere and containment failure is judged imminent, recommend shelter for those areas where evacuation cannot be completed before transport of activity to that location.	

Initiating Conditions	Emergency Action Level (EAL)	Emergency Procedure/Document
d. As release information becomes available adjust these actions in accordance with dose projections, time available to evacuate and estimated evacuation times given current conditions.		
e. Example Sequences:		
1. Small and large LOCA's with failure of ECCS to perform leading to severe core degradation or melt. Ultimate failure of containment likely for melt sequences. (Several hours likely to be available to complete protective actions unless containment is not isolated).	Safety injection signal plus reactor trip and: 1. Safety injection and RHR pumps not running. 2. Flow indications for safety injection read "0". 3. High containment sump level.	

Initiating Conditions	Emergency Action Level (EAL)	Emergency Procedure/Document
2. Transient initiated by loss of feedwater and condensate systems (principle heat removal system) followed by failure of emergency feedwater system for extended period. (Core melting is possible in several hours with ultimate failure of containment likely if the core melts).	Reactor trip on Lo Lo Steam Generator level and wide range generator levels toward offscale low on all steam generators and emergency feedwater flow indicators indicate "0" flow or emergency feedwater pumps not running and cannot be restored within 30 minutes or >3% reactor power and loss of both main feedwater pumps, manually trip reactor.	AP/1/A/5500/06, EP/1/A/5000/04
3. Transient requiring operation of shutdown systems with failure to scram. Core damage is likely. Additional failure of the core cooling and makeup system would lead to core melt.	Reactor remains critical after all attempts to trip the reactor are complete and flow indicators on safety injection and RHR show "0" flow after initiation (NVP5440, NDP5190, 5191, 5180, 5181, NIP5120, 5450) or safety injection and RHR pumps not running with safety injection initiated.	AP/0/A/5500/34

Initiating Conditions		Emergency Action Level (EAL)	Emergency Procedure/Document
	4. Failure of offsite and onsite power along with total loss of emergency feedwater makeup capability for several hours. Would lead to eventual core melt and likely failure of containment.	Undervoltage alarms on 7KV buses and blackout load sequencers actuated and auxiliary feedwater pump(s) fail to start.	AP/1/A/5500/07
	5. Small LOCA and initially successful ECCS. Subsequent failure of containment heat removal system over several hours could lead to core melt and likely failure of containment. NOTE: For melt sequences or for failure of containment isolation systems, the likely failure mode is melt through with release of gases.	Pressurizer low pressure reactor trip and pressurizer low pressure safety injection signal and RHR flow indicators show "0" flow after shift to RHR is attempted and for greater than 2 hours (NDP5190, 5191, 5180, 5181) and RCS T^{o} is rising, and containment air handling system fail to function.	EP/1/A/5000/02, AP/1/A/5500/05
4.1.5	Any major internal or external events (e.g., fires, earthquakes substantially beyond design levels) which could cause massive common damage to plant systems.	As determined by the Shift Supervisor/ Emergency Coordinator.	As dictated by plant conditions.

NOTIFICATION/ACTIVATION
GENERAL EMERGENCY

Notify/Activate the following personnel/or Emergency Centers for all Initiating Conditions listed in Enclosure 4.1. (See Enclosure 4.3 for Telephone Listing)

NOTIFY/ACTIVATE	NOTIFICATION COMPLETE-INITIAL
Shift Supervisor	
Operations Duty Engineer	
Station Manager	
Superintendent of Operations	
Superintendent of Technical Services	
Projects and Licensing Engineer	
Station Health Physicist	
North Carolina State Warning Point	
Mecklenburg County Warning Point	
Lincoln County Warning Point	
Catawba County Warning Point	
Iredell County Warning Point	
Gaston County Warning Point	
Cabarrus County Warning Point	
South Carolina State Warning Point	
N.R.C. via ENS (Red Phone)	
N.R.C. Station Representative	
Superintendent of Maintenance	
Superintendent of Administration	
Construction Project Manager	
Activate T.S.C. (Station Directive 3.8.2)	
Activate O.S.C. (Station Directive 3.8.2)	
Activate C.M.C. (Enclosure 4.3, Enclosure 4.5)	

TELEPHONE LISTING

4.3.1 Operations Duty Engineer (PA System)
P&T Pager -

4.3.2 Station Manager
Home - - System Speed - 12
Home - - System Speed - 11

4.3.3 Superintendent of Operations -
Home - - System Speed - 13

4.3.4 Superintendent of Technical Services -
Home - - System Speed - 14

4.3.5 Projects and Licensing Engineer -
Home - - System Speed - 32

4.3.6 Station Health Physicist
Home - System Speed - 31
P&T Pager

4.3.7 NC State Warning Point, Raleigh - - System Speed - 41

4.3.8 Mecklenburg County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 42
Back-up: Emergency Radio, Code: 21

4.3.9 Lincoln County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 43
Back-up: Emergency Radio, Code: 25

4.3.10 Catawba County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 44
Back-up: Emergency Radio, Code: 27

4.3.11 Iredell County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 45
Back-up: Emergency Radio, Code: 23

4.3.12 Gaston County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 46
Back-up: Emergency Radio, Code: 26

4.3.13 Cabarrus County Warning Point - Primary: Ring Down Phone
Back-up: - System Speed - 47
Back-up: Emergency Radio, Code: 28

NOTE

Radio Code 20 will activate
all county radio units.

TELEPHONE LIST

4.3.14 SC State Warning Point -

4.3.15 N.R.C. Operation Center, Emergency Notification System (ENS Phone)

4.3.16 N.R.C. Station Representative
Office -
Home - System Speed - 57
Wife work - System Speed - 58
P&T Pager

4.3.17 Construction Project Manager Construction
Home - System Speed - 17 or
System Speed - 18

4.3.18 Superintendent of Maintenance -
Home - System Speed - 15

4.3.19 Superintendent of Administration
Home - System Speed - 16

4.3.20 CRISIS MANAGEMENT CENTER ACTIVATION

Hal B. Tucker	Office:	
or	Home:	- System Speed - 53
J. Ed. Smith	Office:	Extension
or	Home:	- System Speed - 54
J. W. Hampton	Office:	Extension
or	Home:	- System Speed - 55
R. W. Bostian	Office:	
or	Home:	- System Speed - 56

Steam Production Duty Man - - System Speed - 51

4.3.21 Radiation Protection Section, Department of Human Resources-
System Speed - 48

MCGUIRE NUCLEAR STATION
NOTIFICATION OF EMERGENCY CONDITIONS

4.4.1 Include as a minimum, the following information to the North Carolina State Warning Point, the six County Warning Points, (Mecklenburg, Catawba, Iredell, Lincoln, Gaston, and Cabarrus) and the South Carolina Warning Point.

NOTE 1: See Enclosure 4.3, Telephone Listing

NOTE 2: A. Complete Part I of this format as a minimal first notification of a reportable incident.

B. Complete Part I and II of this format to provide minimal followup information.

PART I: Initial Emergency Message Information

"This is _____, _____, _____
(Name) (Title)
at McGuire Nuclear Station. I am notifying you of an incident at McGuire, Unit # _____. Please acknowledge when you are ready to copy emergency information."

1. This is McGuire Nuclear Station.
2. My name is _____.
3. This message (Number ___)
   _____ a. Reports a real emergency.
   _____ b. Is an exercise message.
4. My telephone number is _____.
5. Message Authentication: _____.
6. The class of emergency is:
   _____ a. Notification of an Unusual Event
   _____ b. Alert
   _____ c. Site Area Emergency
   _____ d. General Emergency
7. The Classification of Emergency was declared at: _____ on
   (A.M./P.M.)
   _____.
   (Date)

✓ ACKNOWLEDGEMENT	
Mecklenburg	____
Gaston	____
Iredell	____
Lincoln	____
Cabarrus	____
Catawba	____

8. The initiating event causing the Emergency Classification is:

_____

_____

_____

9. The Emergency Condition (Select one of the below options):

_____ a. Does not involve the release of radioactive materials from the plant.

_____ b. Involves the POTENTIAL for a release of but NO release is occurring.

_____ c. Involves a release of radioactive material.

10. We recommend the following protective action: (select one of the below options)

_____ a. No protective action is recommended at this time.

_____ b. People living in zones _____ remain indoors with doors and windows closed.

_____ c. People in zones _____ EVACUATE their homes and businesses.

_____ d. Pregnant women and children in zones _____ remain indoors with the doors and windows closed.

_____ e. Pregnant women and children in zones _____ evacuate to the nearest shelter/reception center.

_____ f. Other recommendations: _____

_____

_____

_____

11. There will be:

_____ a. A followup message

_____ b. No further communications

12. I repeat, this message:

_____ a. Reports an actual emergency.

_____ b. Is an exercise message.

13. Relay this information to the persons indicated in your alert procedures for an incident at McGuire Nuclear Station.

NOTE: Record the Name, Title, Date, Time, and Warning Point at end of Part II.

PART II: Followup Emergency Message Information

1. The type of actual or projected release is:

   _____ a. Airborne

   _____ b. Waterborne

   _____ c. Surface spill

   _____ d. Other

2. The source and description of the release is: _____

   _____

   _____

3. _____ a. Release began/will begin at _____ a.m./p.m.; time since reactor trip is _____ hours.

   _____ b. The estimated duration of the release is _____ hours.

4. Dose projection base data:

   Radiological release: _____ curies, or _____ curies/sec.

   Windspeed: _____ mph

   Wind direction: From _____ °

   Stability class: _____ (A,B,C,D,E,F, or G)

   Release height: _____ Ft.

   Dose conversion factor: _____ R/hr/Ci/M^3 (whole body)

   _____ R/hr/Ci/M^3 (Child Throid)

   Precipitation _____

   Temperature at the site: _____ °F

5. Dose projections:

Dose Commitment

Distance	Whole Body Rem/hour	(Child Thyroid) Rem/hour of inhalation
Site boundary		
2 miles		
5 miles		
10 miles		

Projected Integrated Dose In Rem

Distance	Whole Body	Child Thyroid
Site Boundary		
2 miles		
5 miles		
10 miles		

6. Field measurement of dose rate or contamination (if available):

_____

_____

7. Emergency actions underway at the facility include: _____

_____

8. Onsite support needed from offsite organizations: _____

_____

9. Plant status:
   a. Reactor is: not tripped/tripped
   b. Plant is at: ___% power/hot shutdown/cold shutdown/cooling down
   c. Prognosis is: stable/improving/degrading/unknown.
10. I repeat, this message:
   ____ a. Reports an actual emergency.
   ____ b. Is an exercise message.
11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

NOTE: Record the name, title, date, time, and warning point notified.

(1) _____ Communicator
(Name) (Title)

_____ Mecklenburg
(Date) (Time) (Warning Point)

(2) _____ Communicator
(Name) (Title)

_____ Gaston
(Date) (Time) (Warning Point)

(3) _____ Communicator
(Name) (Title)

_____ Iredell
(Date) (Time) (Warning Point)

(4) _____ Communicator
(Name) (Title)

_____ Catawba
(Date) (Time) (Warning Point)

(5) _____ Communicator
(Name) (Title)

_____ Lincoln
(Date) (Time) (Warning Point)

(6) _____ Communicator
(Name) (Title)

_____ Cabarrus
(Date) (Time) (Warning Point)

(7) _____ Communicator
(Name) (Title)

_____ North Carolina
(Date) (Time) (Warning Point)

(8) _____ Communicator
(Name) (Title)

_____ South Carolina
(Date) (Time) (Warning Point)

CRISIS MANAGEMENT CENTER ACTIVATION FORMAT

1. This is _____ at McGuire Nuclear Station. This is/is not a drill. Open your Crisis Management Plan to Figure E-2 for the following message. Do you have that Figure?
2. My name is _____. I am the _____(title) at McGuire Nuclear Station and am notifying you of an incident at McGuire Nuclear Station, Unit No.____.
3. The incident occurred at _____(Hours) on ___/___/___ (Date).
4. The class of emergency is:_____.
5. The initiating condition causing the emergency is as follows: _____

   _____

   _____

   _____
6. Release of radioactivity:____is taking place ____is not taking place.
7. Wind direction (blowing from) _____degrees.
8. Corrective measures being taken at present are as follows:_____

   _____

   _____

   _____
9. It is recommended that you activate the Crisis Management Center in accordance with the Crisis Management Plan.
10. Do you have any questions?
11. I repeat, this is/is not a drill.
12. Record name of person notified, title, and time notified.

    _____

    (Name) (Title) (Time)

Form 34731 (10-81)
(Formerly SPD-1002-1)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: OP/0/A/6200/48
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: OPERATING PROCEDURE FOR THE OPERATION OF THE POST ACCIDENT LIQUID SAMPLE SYSTEM

(4) PREPARED BY: Anna M. Deck DATE: 5/12/82

(5) REVIEWED BY: [signature] DATE: 12 May 82

Cross-Disciplinary Review By: _____ N/R: N/A

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: Tony L. McConnell Date: 5/17/82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
OPERATING PROCEDURE FOR THE OPERATION OF THE
POST ACCIDENT LIQUID SAMPLE SYSTEM

1.0 Purpose

The Post Accident Liquid Sampling System (PALS) provides the capacity to promptly obtain a reactor coolant sample under a nuclear reactor accident condition.

Sample acquisition during accident conditions (normal sampling area being inaccessible) will help evaluate information related to:

1) The extent of core damage which has occurred or is occurring.
2) Types and quantities of fission products released to containment liquid and gas phases.
3) Reactor Coolant chemistry and radiochemistry.

2.0 Limits

2.1 The PALS will be used to sample primary systems under the following conditions:

2.1.1 Post accident sampling

2.1.2 Inaccessibility of the Primary Sampling Lab due to radiation levels.

2.1.3 Request from the Station Chemist or designee.

2.2 The undiluted sample volume is 1.25 ml. and the final dilution volume shall be controlled between 250-3500 ml.

2.3 Health Physics personnel must perform continuous radiation monitoring during sampling at the liquid sample or control panel on the 716'el and 750'el Auxillary Building respectively.

2.4 Samples will be collected in 1 ml. and 5 ml. lockable glass syringes to be found in the Hot Lab.

3.0 Initial Conditions

3.1 In order to maintain the PALS in an operable condition at all times, the following requirements on Enclosure 9.1, PALS Monthly Checklist, must be done monthly and be current prior to sampling.

3.2 Verify with Operations that 1KC "A" Train is in operation when sampling is to be performed and list on Enclosure 9.2.

3.3 If the containment building has been isolated due to an SI or SIS signal, no sample is to be obtained until the On-Site Support Center can decide how to un-isolate one of the sample lines.

4.0 Panel Preparation

4.1 Valve Alignment for Liquid Sampling

4.1.1 Contact Operations and request the following valves be opened to obtain the sample desired:

NC HOT LEG A

NC Hot Leg #1 Sample Line Inside Cont. Isol	1NM22A
NCHot Leg Sample Header Outside Cont. Isol	1NM26B

NC HOT LEG D

NC Hot Leg #4 Sample Line Inside Cont. Isol	1NM25A
NC Hot Leg Sample Header Outside Cont. Isol	1NM26B

ND PUMP DISCH 1A

*ND Pump 1A and HX Miniflow Stop	1ND68A

ND PUMP DISCH 1B

*ND Pump 1B and HX 1B Miniflow Stop	1ND67B

*Flow should be verified in this piping prior to sampling by verifying with operations that the respective A or B train is in service. Sign off Enclosure 9.2.

4.1.2 Notify Health Physics of sampling and ask for surveillance prior to going to the Control Panel. Sign off Enclosure 9.2.

4.1.3 Record specific conductivity of buffer solution on Enclosure 9.2 from Primary Chemical Data Log and take a stop watch and panel keys (located in Cold Lab Key Box) to Control Panel.

4.2 Control Panel (750'el. Aux. Bldg. Cable Room)

4.2.1 Turn the main selector knob (on control panel) to "Reset". Place key in System Power Switch and turn to the right. Press "Reset" button.

4.2.2 For ND Pump Discharge Sample, place the "Remote/Local" switch on the PALS Control Panel in the "Local" position and press "Open" switch for 1NM39 or 1NM40 to line up for an ND "1A" or "1B" Pump Discharge sample respectively. This is to be done after Operations has opened 1ND68A or 1ND67B.

4.2.3 Place the toggle switch for the dilution water meter and the gas dilution meter on "ON".

4.2.4 Place the toggle switch for the radiation monitor to "ON" and turn the scale select to "rem/hr".

4.2.5 Place the temperature probe selector (Tc) to position 1.

4.2.6 Place the conductivity meter to "Measure".

4.2.7 Push in the pH probe "standardize" knob.

4.2.8 Select the system to be sampled with the system selector - Reactor Coolant System (refers to NC Hot Leg), Reactor Building Nor. Sump (refers to ND Pump Discharge).

5.0 Panel Operation

5.1 Panel Prep (position 1)

5.1.1 Turn the selector knob to "Panel Prep", position 1.

5.1.2 Press the "Selection Power - Activate" button.

5.1.3 Press the "Panel Prep. - Purge" button and hold for 1 min. and release.

5.1.4 Press the "Panel Prep. - Drain" button and hold for 15 sec. and release.

5.1.5 Press the "Panel Prep. - Calibration" button and hold until the conductivity and pH meters stabilize.

5.1.6 Record the specific conductivity reading on Enclosure 9.2, the measured specific conductivity should correspond with the specific conductivity of the pH standard which was prepared in the lab. If not, contact the Station Chemist or Primary Supervisor (If this is a routine test, submit a WR to repair).

NOTE: Multiply conductivity meter reading by 1000 to obtain proper specific conductivity value.

5.1.7 Adjust the pH meter to the known pH of the standard.

5.1.8 Press the "Panel Prep - Purge" button and hold for 30 seconds then release.

5.1.9 Press the "Panel Prep - Flush" button and hold until the conductivity and pH meters stabilize (specific conductivity and pH of demineralized water), then release.

5.1.10 Press the "Panel Prep - Purge" button for 30 seconds and release.

5.1.11 Press the "Panel Prep - Drain" button for 60 seconds and release.

5.1.12 Repeat Steps 5.1.9, 5.1.10, 5.1.11 and then continue to Section 5.2.

5.2 Sample Collection (Position 2)

5.2.1 Turn the selector knob to "Sample Recirculation", position 2.

5.2.2 Set the temperature selector, located on the instrument panel, to Tc 1.

5.2.3 Record the radiation monitor reading on Enclosure 9.2 (Background).

5.2.4 Press the "Selection Power - Activate" button. Record the starting time on Enclosure 9.2. The radiation monitor should show an increased activity level as sample enters the liquid panel.

5.2.5 If Tc1 goes above 190°F, sample is not being cooled sufficiently. Turn selector to "Reset". Press" Reset" button and turn Power Key to vertical position. Call Station Chemist or his designee.

5.2.6 Turn the selector knob to "sample", position 3, when the sample temperature at Tc 1 stabilizes. Record the temperature on Enclosure 9.2.

NOTE: Tc 3 monitors KC Coolant outlet from the PALS HX and can be monitored during Tc 1 and Tc 2 stabilization.

5.3 Sample (Position 3)

5.3.1 Turn the temperature selector to Tc 2.

5.3.2 Press the "Selection Power - Activate" button.

5.3.3 Monitor the temperature gauge and when Tc 2 stabilizes record the temperature and radiation readings on Enclosure 9.2.

5.3.4 Subtract initial background activity from sample activity found during Tc 2 stabilization and record reading on Enclosure 9.2. This is the radiation due to the sample.

5.3.5 Press the "Sample - 1 Tc 2 Stabilize" button. When pressure stabilizes record the reading on Enclosure 9.2.

5.3.6 Press the "Sample - 2 Pressure Stabilize" button. Record the time sample flow stops on Enclosure 9.2.

5.3.7 Turn the selector knob to "Depressurization", position 4.

5.3.8 Request Operations to close the valves opened in section 4.1. If an ND Pump Discharge sample is being taken, press "close" switch for the ND Pump Discharge Isolation Valve, either 1ND39 or 1ND40 and place the "Remote/Local" switch in the "Remote" position.

5.4 Depressurization (Position 4)

5.4.1 Press the "Reset" button on the gas flow totalizer to zero the readout. Preset the counter on the totalizer to 99999.

5.4.2 Press the "Selection Power - Activate" button. Verify the pressure gauge on the instrument panel indicated a vacuum of -25 inches of mercury (-25 level). Wait 60 seconds.

5.4.3 Press the "Start" button on the gas flow totalizer and monitor the pressure gauge. Press the "Stop" button on the totalizer when the Level gauge needle first begins to move. Press "Start" button and "Stop" button to add small amounts of nitrogen and continue small adds until level meter reads 0-2 inches in level. If 5 inches is exceeded, a new stripped gas sample will need to be taken (ie) start from Section 4.1.

5.4.4 Turn the selector knob to "Liquid Sample", position 5.

5.5 Liquid Sample (Position 5)

5.5.1 Press the "Selection Power - Activate" button.

5.5.2 Press the "Liquid Sample - 1) Log Conductivity" button and hold until the conductivity meter stabilizes. Record the specific conductivity on Enclosure 9.2.

5.5.3 Press both the "Liquid Sample - 1)Log Conductivity" and Liquid Sample - 2)Log pH" bottons and hold until the pH meter stabilizes. Record the pH on Enclosure 9.2.

5.5.4 Press the "Gas Sample - 1) Activate" button and hold for 1 second.

5.5.5 Press the "Gas Sample - 3) Diluted Gas Sample Grab" button.

5.5.6 Turn the selector knob to "Liquid Sample Prep.", position 6.

5.6 Liquid Sample Prep (Position 6)

5.6.1 Press the "Selection Power - Activate" button.

5.6.2 Press the "Liquid Sample Prep - B Activate to desired ml. volume" button and wait 5 seconds, after depressing. This deposits 1.25 ml of sample for dilution.

5.6.3 Press the "Reset" button on the dilution water flow totalizer and preset the meter for 250 mls of dilution water. Press the "Start" button and let dilution continue to completion. Record the dilution volume on Enclosure 9.2.

5.6.4 Press the "Liquid Sample Prep - 3) Activate Mix" button and hold for 10 seconds.

5.6.5 Turn the selector knob to "Liquid Sample", position 7.

5.7 Liquid Sample (Position 7)

5.7.1 Press the "Selection Power - Activate" button.

5.7.2 Press the "Liquid Sample - Activate" button. Wait 15 seconds.

5.7.3 Press the "Liquid Sample - Diluted Sample Grab" button. Wait 10 seconds.

5.7.4 Turn the selector knob to "Flush", position 8.

5.8 Flush (Position 8)

5.8.1 Press the "Selection Power - Activate" button.

5.8.2 Press the "Flush - Activate" button and wait 4 - 5 minutes, 1st flush cycle.

5.8.3 Press the "Flush - Activate" button and monitor pH and conductivity meters until they reach equilibrium of demineralized water, 2nd flush cycle. (Approx. 10 minutes.)

5.8.4 Press the "Flush - Activate button and wait 3 minutes, 3rd flush cycle.

5.8.5 Press the "Flush - Activate" button, afterwards, the "Complete": light must illuminate. If light doesn't illuminate continue and write a work request after sampling is completed.

5.8.6 Turn the selector knob to "Drain", position 9.

5.9 Drain (Position 9)

5.9.1 Press the "Selection Power - Activate" button.

5.9.2 Press the "Drain - Activate" button. Wait 120 seconds.

5.9.3 Press the "Drain - Activate" button. Wait 120 seconds.

5.9.4 Press the "Drain - Activate" button. Wait 13 minutes.

5.9.5 Press the "Drain - Activate" button and the "Complete" light should illuminate.

5.9.6 Turn the selector knob to "reset" and press the "reset" button.

5.9.7 Turn the System Power Key to the left to operate the sump pump: Allow pump to run for 15 minutes to insure sump is pumped dry.

5.9.8 Turn the System Power Key to the right to re-energize the PALS. Record the radiation level on Enclosure 9.2.

5.9.9 If the field at the panel is greater than 3 Rem/hr, continue to section 5.10, otherwise turn the System Power Key to the vertical off position and proceed to section 6.0.

5.10 Decontamination

5.10.1 Turn the selector knob to "Panel Prep", position 1.

5.10.2 Press the "Selection Power - Activate" button.

5.10.3 Press and hold the "Flush" button for 2 minutes.

5.10.4 Repeat Panel Flush and Drain modes starting Section 5.8 through 5.9.8.

5.10.5 If radiation level is <3 Rem/hour, turn the System Power Key to the vertical position and continue to Section 6.0. If however, the radiation level remains >3 Rem/hour, go back to step 4.1 and repeat the sequence using a larger dilution volume. See Enclosure 9.3 to determine the dilution volume. If with a 3500 ml dilution volume the radiation level is still >3 Rem/hour, contact the Station Chemist or his designee.

6.0 Sampling

6.1 Verify the operability of 2-1 ml and 2-5 ml glass locking syringes located in the Hot Lab and label them.

6.2 Contact Health Physics Surveillance and Control Group and request surveillance while taking gas and liquid samples from the sample portion of the PALS located on 716'el. Aux. Bldg. FF-54.

6.3 Collect 2 - 1.0 ml stripped gas samples at the gas sample panel septum located on the north side of the sample panel and place syringes in plastic bag.

6.4 Collect 2 - 5 ml liquid samples from the liquid sample septum located on the south side of the sample panel and place syringes in plastic bag.

6.5 Replace the septa after collecting the syringe samples prior to returning to the Hot Lab.

6.6 Take syringes to Hot Lab in a sample carrier and place in operating fume hood behind a lead brick shield to await analysis.

7.0 Sample Analysis

7.1 One syringe of stripped gas will be analyzed via Chemistry procedure CP/O/B/8100/31, Chemistry Procedure for the Analysis of Gases From the Reactor Coolant System Gas Mixtures. No averaging of gas samples will be done as in the procedure as only one syringe of sample will be pulled. Analyze the sample for % H_2 and O_2 and report results as follows:

$$\% H_2 \times \frac{1000 \text{ cc}}{170 \text{ kg}} \times \frac{1}{100} = \text{cc/kg } H_2 \quad \text{(ie) } \%H_2 \times 58.3 = \text{cc/Kg } H_2$$

$$\% O_2 \times \frac{1000 \text{ cc}}{0.170 \text{ kg}} \times \frac{1}{100} = \text{cc/kg } O_2 \quad \text{(ie) } \%O_2 \times 58.3 = \text{cc/Kg } O_2$$

Where: % gas is determined via CP/O/B/8100/31
1000 cc = stripped gas bomb volume
0.170 kg = reactor coolant sample size
1/100 = conversion of percent to decimal
Report cc/kg H_2 and O_2 on Enclosure 9.2.

7.2 Take the remaining 1 ml. syringe with stripped gas sample, withdraw 1 ml air from septum stoppered glass vial and load 1 ml stripped gas. Analyze by GeLi Spectral Analysis following CP/O/A/8200/05, Chemistry Procedure for Radioisotope Analysis.
Report the actual sample volume on the botton of the sample analysis form under remarks and submit to Health Physics so that they may adjust isotope acitivities from diluted samples to reflect reactor coolant activity. The calculation is as follows:

$$\text{Sample Volume} = \frac{170 \text{ ml.}}{1000} = 0.17 \text{ ml.}$$

Where: 1000 cc = stripped gas bomb volume

170 cc = reactor coolant sample size

7.3 Take 1 ml of liquid sample and dilute to 50 mls with Super Q Water in a 60 ml poly bottle. Analyze by GeLi Spectral Analysis following CP/O/A/8200/05. Report the actual sample volume being counted on the bottom of the sample analysis form under remarks and submit to Health Physics so that appropriate adjustment of isotope activities occurs. The calculation of sample volume is as follows:

$$\text{Sample Volume} = \frac{1.25 \text{ ml}}{\text{Total Dilution Volume}}$$

Where: 1.25 ml. = Reactor Coolant Volume

Total Dilution Volume = mls water added in Part II #11 of Enclosure 9.2 + 1.25 mls.

Example: 300 ml. dilution water added

$$\text{Sample Volume} = \frac{1.25 \text{ ml}}{301.25 \text{ ml}} = 3.32 \times 10^{-3} \text{ ml.}$$

7.4 Take 2 ml. of liquid sample and analyze for Boron using CP/O/B/8100/5E, Chemistry Procedure for the Determination of Boron in Water and Wastewater, Colormetric Method.

The value received must be corrected for dilution as follows:

$$\text{ppm Boron in reactor coolant} = \text{ppm measured} \times \frac{\text{Total Dilution Volume}}{1.25 \text{ ml.}}$$

Where: ppm Boron measured = value obtained via CP/O/B/8100/5E

Total Dilution Volume = mls water added Part II #11 of Enclosure 9.2 + 1.25 ml.

1.25 ml. = reactor coolant sample

7.5 If dilution proves inadequate for any of the above analyses, contact Station Chemist or his designee.

7.6 Report all results in the Primary Chemistry Data Log and Enclosure 9.2.

7.7 A minimum of 3 mls. of liquid will be needed for halide analysis (chloride). If insufficient sample remains after that needed for Boron and GeLi Spectral Analysis, the panel will be operated again within 10 hrs. after initial sampling and 2-5 ml. syringes of liquid sample taken for halide analysis. One technicon cup of liquid sample will be analyzed via CP/O/A/8100/06, Chemistry Procedure for the Determination of Chloride in High Purity Water. Results must be adjusted via the calculation in Section 7.4, substituting ppb Cl^- for ppm B, so that dilution is taken into account. Record value in Primary Chemistry Data Log.

NOTE: Chloride sample to be taken only in an accident situation.

7.8 Clean 5 ml. syringes with Super Q Water after use.

8.0 References

8.1 Duke Power Company Nuclear Station Post Accident Liquid Sample Panel.

8.2 MC-1572-4.0 LL, Rev. 1

8.3 CP/O/B/8100/31, Chemistry Procedure for the Analysis of Gases from Reactor Coolant System Gas Mixtures.

8.4 CP/O/B/8100/05E, Chemistry Procedure for the Determination of Boron in Water and Wastewater.

8.5 CP/O/A/8200/05, Chemistry Procedure for Radioisotope Analysis.

8.6 CP/O/A/8100/06, Chemistry Procedure for the Determination of Chloride in High Purity Water.

9.0 Enclosures

9.1 PALS Monthly Checklist

9.2 PALS Data Sheet

9.3 Correction of Dilution Volume

9.4 PALS Control Panel Diagram

9.5 Directives for Personnel Conduct in the Hot Laboratory, the Atomic Absorption Laboratory, Unit 1 & 2 Primary Sampling Laboratories, And the Radwaste Operating Center.

10.0 General Information

10.1 PALS Breaker - Breaker Box 1KJ Breaker #34 located on 750' el. MM56

10.2 Phone at Control Panel - Ext.

10.3 Phone at Sample Panel - Ext.

OP/O/A/6200/48
ENCLOSURE 9.1
PALS MONTHLY CHECKLIST

1. pH 7.0 buffer solution must be replaced once a month. Prepare pH 7.0 buffer (4 liters) as per CP/O/B/8100/43. Measure specific conductivity and log in Primary Chemical Data Log.

   buffer expiration date:_____

   specific conductivity:_____umhos/cm

   Technician/Date: _____/_____

2. Verify that the 1000 ppm Boron Standard Stock Solution used in CP/O/B/8100/05E, Chemistry Procedure for the Determination of Boron in Water and Wasterwater, will not expire prior to next monthy inspection. If so, replace as stated in the above procedure.

   1000 ppm Boron std. expiration date:_____

   Technician/Date: _____/_____

   Carminic Acid and 10 ppm Boron std are to made prior to sampling.

3. The following valves should remain open:

		Technician	Date
Instrument Air Supply Isolation	1VI231		
Nitrogen Supply Isolation	1GN124		
KC Supply Isolation to PALS HX	1KC829		
DI Water Supply Isolation	1NM376		
Panel DI Water Inlet Isolation	LATER		
Panel Nitrogen Inlet Isolation	LATER		
Panel Instrument Air Inlet Isol.	LATER		
Panel Sample Return Isolation	LATER		
Panel KC Inlet to HX Isolation	1KC957		
Panel KC Outlet from HX Isolation	LATER		

4. pH and conductivity meters must be checked when buffer solution is renewed. Complete PALS operating procedure sections 4.2.1, 4.2.6, 4.2.7, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.1.6 5.1.7, 5.1.8, 5.1.9, 5.1.10, and 5.1.11. Turn System Power Key to vertical position to deenergize panel.

   calibration date:_____

   Technician: _____

5. Go to section 3.0 and take a reactor coolant sample using the PALS, analyzing the sample as stated in the procedure.

ENCLOSURE 9.2
OP/O/A/6200/48

PALS DATA SHEET

		Time
PART I (Complete prior to going to control panel).		
1 - Verify 1KC "A" Train is in operation.		_____
2 - Sample valves opened as per 4.1.1 for the respective sample.		_____
3 - Health Physics notified for monitoring support.		_____
4 - Specific Conductivity of pH 7.0 buffer (reference Primary Chemistry Log).	_____ umhos/cm	_____
PART II (Complete at the control panel)		
1 - Specific Conductivity of pH 7.0 buffer.	_____ umhos/cm	_____
2 - pH meter standardized.		_____
3 - Radiation field (pre-sample background)	_____ rem/hr	_____
4 - Time sample purge started.	_____ hrs	_____
5 - Temperature: Tc 1	_____ $^{o}_{F}$	_____
Temperature: Tc 2	_____ ^{o}F	_____
6 - Radiation field (at sampling)	_____ rem/hr	_____
- Radiation field (background)	_____ rem/hr	_____
Radiation due to sample	_____ rem/hr	_____
7 - Pressure at Isolation	_____ psig	_____
8 - Time sample purge isolated	_____ hrs	_____
9 - Specific Conductivity of sample	_____ umhos/cm	_____
10- pH of sample (measured)	_____	_____
11- Dilution volume (mls. H_2O added)	_____ mls	_____
12- Radiation field (post-sample)	_____ rem/hr	_____
13- *pH of sample (boron corrected)	_____	_____

*NOTE: If boron is present in sample, pH can be adjusted for boron by referring to boron curve in CP/O/B/8100/43. If this is a post accident sump sample, do not correct pH for boron.

PART III (Complete in Hot Lab)		
1 - Gas Analysis	_____ cc/kg H_2	_____
	_____ cc/kg O_2	_____
2 - GeLi Spectral Analysis (Gas)		_____
3 - GeLi Spectral Analysis (Liquid)		_____
4 - Boron Concentration	_____ ppm B	_____
5 - Chloride Concentration	_____ ppm Cl^-	_____

TECHNICIAN _____

DATE _____

ENCLOSURE 9.3
OP/O/A/6400/48

CORRECTION OF DILUTION VOLUME

To correct the dilution volume, divide the final radiation reading (Section 5.10.5) by 3 rem/hr, then multiply this by 250 ml to obtain desired dilution volume in Section 5.6.3.

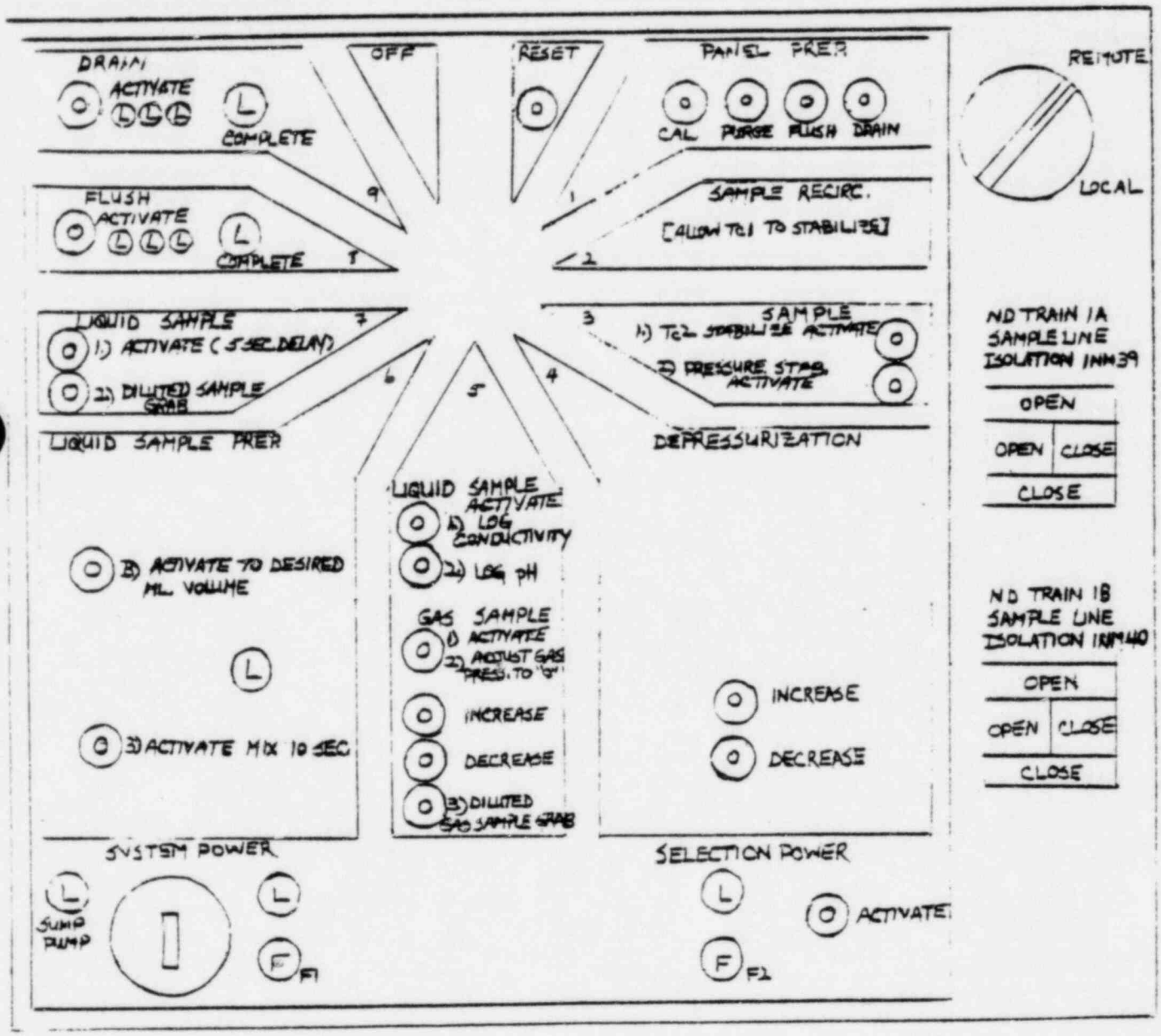
Example: Reading in Section 5.10.5 = 10 rem/hr

then $\frac{10 \text{ rem/hr}}{3} \times 250 = 833$ ml

Go back to Section 5.2 and repeat the sample sequence, using a dilution volume of 833 ml in Section 5.6.3 instead of 250 mls.

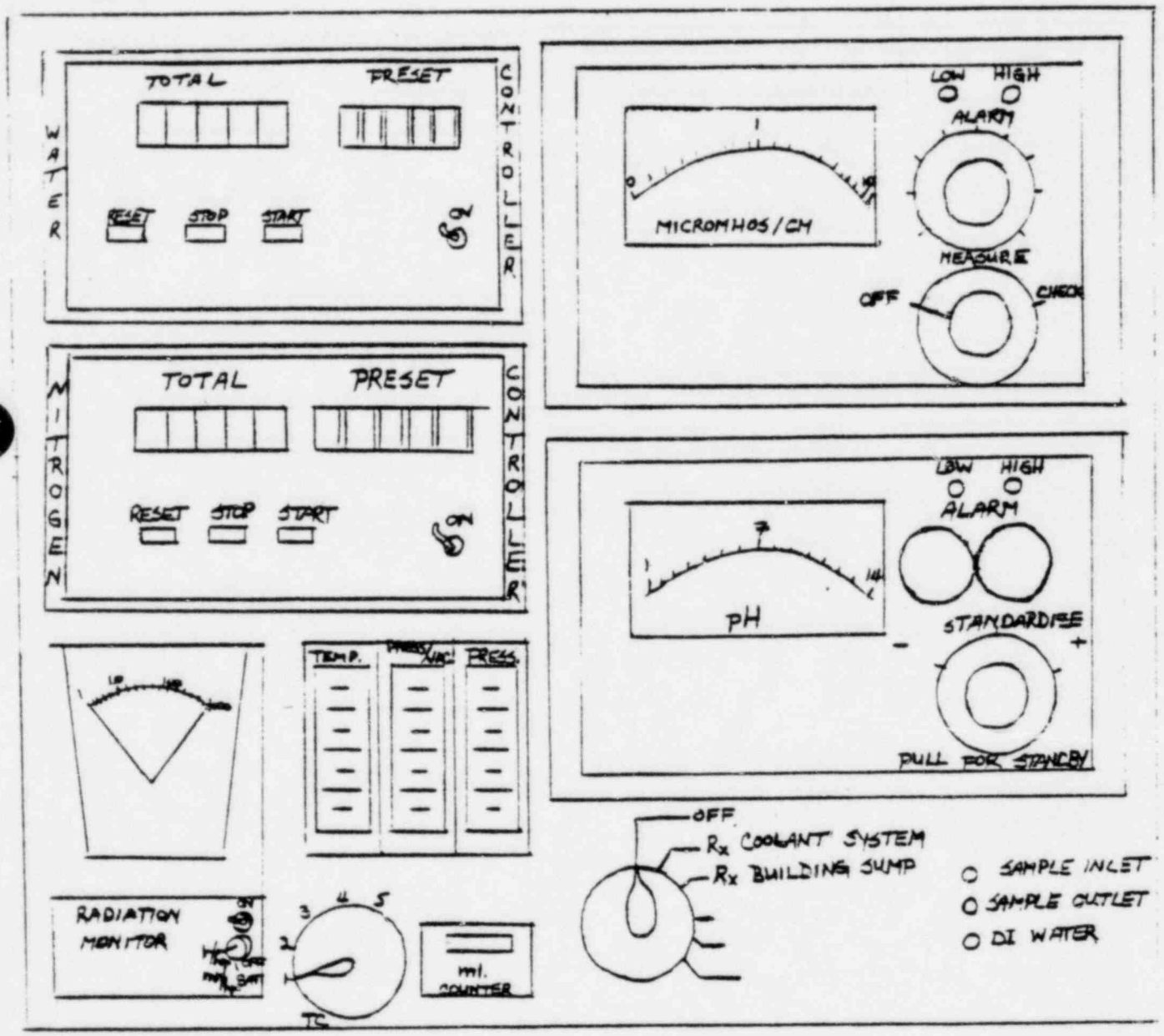
ENCLOSURE 9.4
OP/O/A/6200/48

PALS CONTROL PANEL DIAGRAM



ENCLOSURE 9.4
OP/O/A/6200/48

PALS CONTROL PANEL DIAGRAM



ENCLOSURE 9.5
OP/0/A/6200/48

DIRECTIVES FOR PERSONNEL CONDUCT IN THE HOT LABORATORY, THE ATOMIC ABSORPTION LABORATORY, UNIT 1 & 2 PRIMARY SAMPLING LABORATORIES, AND THE RADWASTE OPERATING CENTER

1. Eating, drinking, and the use of tobacco are prohibited.
2. Entry and exit from the Laboratories shall comply with current Health Physics Procedures.
3. No person shall work with or near radioactive materials without the proper safety attire which includes use of rubber gloves, lab coat, and eye protection.
4. Pipetting shall not be done by mouth suction. A safety pipet filler or pipet aide shall be used.
5. Radioactive liquid waste shall be disposed of in specific sinks only. Liquid radioactive sample volumes, treated water (TD, TH, Super Q) flows, and disposal of non-radioactive liquids are to be maintained as minimal as possible in order to limit wastes requiring radioactive waste processing.

   (A) Hot Laboratory

   1. East wall sink - this sink is for high activity (>1000 cpm 1/2" from 100 ml bottle) liquid wastes only. The drain is routed to the Chemical Drain Tank and the contents must undergo costly solidification and treatment as solid wastes. Low activity or non-radioactive materials are not to be disposed of in this sink.
   2. North wall sink and fume hood sinks - these sinks are for low activity (<1000 cpm 1/2" from 100 ml bottle) wastes. These drains are routed to the Floor Drain Tank.
   3. Mercuric thiocyanate chloride wastes are collected in buckets until filled, then they are transported to the Solid Waste System for disposal. No mercuric thiocyanate is to be introduced to any sink drain.

   (B) Atomic Absorption Laboratory

   1. Radioactive materials of any type shall not be introduced to these sinks since the drains are routed directly to the environment (drain to yard drain and into the Standby Nuclear Service Water Pond).
   2. Radioactive liquid wastes are collected in specified containers and emptied into the appropriate Hot Laboratory sink as necessary.

   (C) Primary Sampling Laboratories I & II

   1. Sink drains for all wastes are routed to the Waste Evaporator Feed Tank.
   2. Azide wastes from Winkler Dissolved Oxygen analysis are collected in specified containers, treated as per procedure CP/0/B/8100/91, and disposed of in a Primary Lab Sink.
6. Radioactive solid wastes and contaminated materials are to be collected in specified radioactive waste containers only. Non-radioactive or non-contaminated materials are not to be disposed of in the radioactive waste containers in order to minimize solid waste processing.
7. Radioactive materials and contaminated materials can be temporarily stored at designated locations in the Laboratories.
8. All apparatus used in the Laboratories shall remain in the Laboratories unless verified non-contaminated by Health Physics personnel for removal.
9. Good housekeeping practices shall be observed at all times, including routine precautionary activity surveys.
10. In the event of radioactive liquid spillage, the following steps are to be performed:

    (A) The liquid is to be blotted up; wear rubber gloves and shoe covers. Contain the spill to as small an area as possible.

    (B) All disposable materials contaminated by the spill and the cleanup process are to be deposited in a radioactive waste container.

    (C) The area of the spill is to be identified clearly and the type activity indicated if contamination remains.

    (D) Contact Health Physics for surveillance and de-contamination.
11. If, in the course of work, personnel contamination is suspected, a survey with an appropriate activity detector is to be made immediately. This should be followed by required de-contamination cleaning and activity determinations.
12. All wounds, spills or other emergencies are to be reported to Health Physics immediately.
13. If you have a cut, open wound, or skin lesion, notify a Chemistry Supervisor prior to handling any radioactive material.
14. Before exiting a laboratory, ensure completeness or status of activities as to prevent contamination, sample or water flow unattended, or sample mix up. Complete all necessary paper work prior to exit.
15. Fume hoods shall be in operation at all times when the possibility of airborne radiation exists.
16. No radioactive materials are permitted in the Cold, Conventional Sampling, or Water Treatment Laboratories.

Form SPD-1002-1

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: ~~HP/1/B/1009/01~~
Change(s) 0 to
0 Incorporated

(2) STATION: Mebane

(3) PROCEDURE TITLE: Procedure For Estimating Food Chain Doses Under Post Accident Conditions

(4) PREPARED BY: R.F. DeLonis DATE: 7/12/82

(5) REVIEWED BY: J.R. Leonard DATE: 7/12/82

Cross-Disciplinary Review By: _____ N/R: JRL

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: Tony L. McConnell Date: 7/14/82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
PROCEDURE FOR ESTIMATING FOOD CHAIN DOSES
UNDER POST ACCIDENT CONDITIONS

1.0 Purpose

This procedure describes the method to be used in order to rapidly estimate offsite doses through significant food chain pathways under post accident conditions.

2.0 References

2.1 U.S. NRC Reg. Guide 1.109

3.0 Limits and Precautions

3.1 Reg. Guide 1.109 is intended to guide the calculation of doses under long term steady state conditions. The body of this procedure contains notes covering cases in which the calculation of doses under accident conditions differs from the calculation of doses under routine conditions.

3.2 This procedure covers only the calculation of the food chain pathway doses most likely to be limiting under post accident conditions. Other food chain doses must be calculated using the methods of the Duke Power Company Offsite Dose Calculation Manual or Reg. Guide 1.109. General Office Radwaste or Laboratory Services personnel shall be consulted when these other food chain doses are calculated.

3.3 The errors in the doses calculated through the use of this procedure are not necessarily conservative (on the high side).

3.4 The assumptions outlined in this procedure shall be carefully compared with existing post accident conditions before this procedure is used.

4.0 Procedure

4.1 Vegetation → Cow or Goat Milk → Consumer Dose Pathway for Radioiodine.

4.1.1 Assumptions:

Child (infant) milk consumption: 900 ml/day (2 pints approx.)

Adult milk consumption: 850 ml/day (2 pints approx.)

Decay time between iodine deposition on vegetation and milk consumption: 2 days.

4.1.2 Doses can be calculated on the basis of radioiodine concentrations measured in grass (or other vegetation consumed by milk animals) or milk. Doses calculated on the basis of milk radioiodine concentrations will be much more accurate than those calculated on the basis of vegetation radioiodine concentrations. However, the measurement of vegetation radioiodine concentrations permits the prediction of approximate doses due to milk consumption one or two days later.

4.1.3 Calculation of doses through vegetation analysis:

4.1.3.1 Collect samples of vegetation eaten by milk animals and analyze on GeLi counter. Compute radioiodine concentrations in μCi/gram of undried vegetation.

4.1.3.2 Calculate thyroid doses by use of the following equations:

$$D_{TCV} = \sum_{i=1}^{5} (F_{CiV} C_{iV})$$

$$D_{TAV} = \sum_{i=1}^{5} (F_{AiV} C_{iV})$$

where:

D_{TCV} = Human child infinity thyroid dose commitment in rems per day that milk animal consumes contaminated vegetation.

D_{TAV} = Same as above for human adult.

i = I-131, I-132, I-133, I-134, or I-135.

C_{iV} = Concentration of radioiodine in vegetation in μCi/g.

F_{CiV}, F_{AiV} = taken from table below.

Units = $\frac{\text{rem/day}}{\mu Ci/g}$

i		Child F_{CiV}	Adult F_{AiV}
1	I-131	3900	510
2	I-132	*	*
3	I-133	210	23
4	I-134	*	*
5	I-135	*	*

* These can be neglected.

4.1.4 Calculation of doses through milk concentrations:

NOTE: Radioiodine concentrations in milk will peak about two days after concentrations in or on vegetation peak.

4.1.4.1 Collect samples of milk and analyze in GeLi counter. Compute radioiodine concentrations in μCi/ml.

4.1.4.2 Calculate thyroid doses by use of the following equations:

$$D_{TCM} = \sum_{i=1}^{5} (F_{CiM}\ C_{iM})$$

$$D_{TAM} = \sum_{i=1}^{5} (F_{Aim}\ C_{iM})$$

where:

D_{TCM} = Human child thyroid dose commitment in rems per day of consumption of contaminated milk.

D_{TAM} = Same as above for human adult.

C_{iM} = Concentration of ith radioiodine in milk in μCi/ml.

F_{CiM}, F_{AiM} = taken from table below:

Units = $\frac{\text{rem/day}}{\mu\text{Ci/ml}}$

i		Child F_{CiM}	Adult F_{AiM}
1	I-131	13000	1700
2	I-132	150	17
3	I-133	3000	310
4	I-134	38	6
5	I-135	590	65

NOTE: Whole body doses due to radioiodine ingestion will always be much smaller than thyroid doses.

4.2 Water → Fish → Consumer Pathway for Radiocesium.

4.2.1 Assumptions:

Adult fish consumption: 57 g/day (2 oz. approx.)

Child (teen) fish consumption: 44 g/day (1½ oz. approx.)

Bioaccumulation factor for cesium in fish: 2000

4.2.2 Dose can be calculated on the basis of radiocesium concentrations in either water or fish. Doses calculated on the basis of concentrations in fish will be more accurate than those calculated on the basis of concentrations in water. However, the measurement of water radiocesium concentrations permit the prediction of doses due to future consumption of fish.

4.2.3 Calculation of doses through water analysis:

4.2.3.1 Collect water samples and analyze on GeLi counter. Compute radiocesium concentrations in μCi/ml.

4.2.3.2 Calculate whole body doses by use of the following equations:

$$D_{BCW} = (7700)\ (C_{134W}) + (4600)\ (C_{137W})$$

$D_{BAW} = (1400)\ (C_{134W}) + (8200)\ (C_{137W})$

where:

D_{BCW} = Human child (teen) infinity whole body dose commitment in rems per day fish are exposed to contaminated water.

D_{BAW} = Same as above for human adult.

C_{134W} = Concentration of CS-134 in water in µCi/ml.

C_{137W} = Concentration of Cs-137 in water in µCi/ml

4.2.4 Calculation of doses through fish concentrations:

4.2.4.1 Collect fish samples and analyze in GeLi counter. Compute radiocesium concentrations in µCi/gram (wet).

4.2.4.2 Calculate whole body doses using the following equations:

$D_{BCF} = (4.0)\ (C_{134F}) + (2.2)\ (C_{137F})$

$D_{BAF} = (7.0)\ (C_{134F}) + (4.3)\ (C_{137F})$

where:

D_{BCF} = Human child (teen) infinity whole body dose commitment in rems per day of consumption (at 44 g/day) of contaminated fish.

D_{BAF} = Human adult infinity whole body dose commitment in rems per day of consumption (at 57 g/day) of contaminated fish.

C_{134F} = Concentration of Cs-134 in fish in µCi/gram.

C_{137F} = Concentration of Cs-137 in fish in µCi/gram.

NOTE: In any one day, a person may easily consume 5 or even 10 times the assumed daily quantity of fish. Liver doses due to radiocesium

ingestion are about two times the whole body doses. Thus the whole body doses are more limiting.

4.3 Drinking Water → Consumer Pathway for Radioiodine

4.3.1 **Assumptions:**

Child (infant) water consumption: 900 ml/day (2 pints approximately). Decay time in water distribution system: 1 day.

4.3.2 Collect water samples and analyze on GeLi counter. Compute radioiodine concentrations in μCi/ml.

4.3.3 Calculate thyroid doses by use of the following equations:

$$D_{TCW} = \sum_{i=1}^{5} (F_{CiW}\ C_{iW})$$

$$D_{TAW} = \sum_{i=1}^{5} (F_{AiW}\ C_{iW})$$

where:

D_{TCW} = Human child infinity thyroid dose commitment in rems per day of consumption of contaminated water.

D_{TAW} = Same as above for human adult.

i = I=131, I-132, I-133, I-134, or I-135

C_{iw} = Concentration of ith radioiodine in water in μCi/gram.

F_{CiW}, F_{AiW} = taken from table below

Units = $\frac{\text{rem/day}}{\mu\text{Ci/gram}}$

		Child	Adult
i		F_{Ciw}	F_{AiW}
1	I-131	12000	3600
2	I-132	*	*
3	I-133	1300	320
4	I-134	*	*
5	I-135	49	13

*These can be neglected.

NOTE: Whole body doses due to radioiodine ingestion will always be much smaller than thyroid doses.

4.4 Record all results on appropriate Enclosure.

5.0 Enclosures

5.1 Milk Pathway Data Sheet

5.2 Fish Pathway Data Sheet

5.3 Water Pathway Data Sheet

HP/O/B/1009/04
Enclosure 5.1

MILK PATHWAY DATA SHEET

This is to calculate thyroid dose from the milk pathway (section 4.1).

Vegetation Analysis

I - 131 Conc. (C_{1V}) = _____ µCi/ml

I - 133 Conc. (C_{3V}) = _____ µCi/ml

$D_{TCV} = (3900)(C_{1V}) + (210)(C_{3V})$

D_{TCV} = _____ Rem

$D_{TAV} = (510)(C_{1V}) + (23)(C_{3V})$

D_{TAV} = _____ Rem

Milk Analysis

I - 131 Conc. (C_{1V}) = _____ µCi/ml

I - 132 Conc. (C_{2V}) = _____ µCi/ml

I - 133 Conc. (C_{3V}) = _____ µCi/ml

I - 134 Conc. (C_{4V}) = _____ µCi/ml

I - 135 Conc. (C_{5V}) = _____ µCi/ml

$D_{TCM} = (13000)(C_{1V}) + (150)(C_{2V}) + (3000)(C_{3V}) + (38)(C_{4V}) + (590)(C_{5V})$

D_{TCM} = _____ Rem

$D_{TAM} = (1700)(C_{1V}) + (17)(C_{2V}) + (310)(C_{3V}) + (6)(C_{4V}) + (65)(C_{5V})$

D_{TAM} = _____ Rem

Sample taken at (point/location) _____

_____ _____

Date/Time Signature

FISH PATHWAY DATA SHEET

This is to calculate whole body dose from the fish pathway (section 4.2)

Water Analysis

Cs - 134 Conc.(C_{134W}) = _____ µCi/ml

Cs - 137 Conc.(C_{137W}) = _____ µCi/ml

$D_{BCW} = (7700)(C_{134W}) + (4600)(C_{137W})$

D_{BCW} = _____ Rem

$D_{BAW} = (14000)(C_{134W}) + (8200)(C_{137W})$

D_{BCW} = _____ Rem

Fish Analysis

Cs - 134 Conc.(C_{134F}) = _____ µCi/ml

Cs - 137 Conc.(C_{137F}) = _____ µCi/ml

$D_{BCF} = (4.0)(C_{134F}) + (2.2)(C_{137F})$

D_{BCF} = _____ Rem

$D_{BAF} = (7.0)(C_{134F}) + (4.3)(C_{137F})$

D_{BAF} = _____ Rem

Sample taken at (point/location) _____

_____ _____

Date/Time Signature

WATER PATHWAY DATA SHEET

This is to calculate thyroid dose from drinking water (Section 4.3).

I - 131 Conc. (C_{1W}) = _____ µCi/ml

I - 133 Conc. (C_{3W}) = _____ µCi/ml

I - 135 Conc. (C_{5W}) = _____ µCi/ml

$D_{TCW} = (12000)(C_{1W}) + (1300)(C_{3W}) + (49)(C_{5W})$

D_{TCW} = _____ Rem

$D_{TAW} = (3600)(C_{1W}) + (320)(C_{3W}) + (13)(C_{5W})$

D_{TAW} = _____ Rem

Sample taken at (point/location) _____

_____ _____

Date/Time Signature

Form SPD-1002-1

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1009/15
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Nuclear Post-Accident Containment Air Sampling System Operating Procedure

(4) PREPARED BY: W. B. McLe DATE: 3/11/82

(5) REVIEWED BY: J. R. Leonard DATE: 3/12/82

Cross-Disciplinary Review By: _____ N/R: JRL

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: D. J. Rains Date: 3/12/82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
NUCLEAR POST-ACCIDENT CONTAINMENT AIR
SAMPLING SYSTEM OPERATING PROCEDURE

1.0 Purpose

1.1 This procedure describes the operation of the Nuclear Post-Accident Containment Air Sampling System in order to promptly obtain a containment air sample under a nuclear reactor accident condition to:

1.1.1 Keep radiation exposure less than three (3) Rems whole body dose and eighteen and three-quarters (18 3/4) Rems to extremities for personnel taking samples,

1.1.2 Provide information related to the extent of core damage that has occurred or may be occurring during an accident, and

1.1.3 Determine the types and quantities of fission products released to the containment atmosphere and which may be released to the environment.

2.0 References

2.1 Duke Power Company Nuclear Station Post-Accident Containment Air Sampling System Manual.

2.2 USNRC Regulatory Guides 1.3 and 1.4.

2.3 Station Health Physics Manual, Section 13.1, Handling, Storage, and Disposal of Radioactive Sources.

2.4 Station Health Physics Manual, Section 12.1, Operation Procedure for the Nuclear Data -6600 GeLi System.

2.5 Station Chemistry Manual, Procedure CP/O/A/8200/05, Enclosure 6.3, Directives for Personnel Conduct in the Hot Laboratory.

2.6 Station Chemistry Manual, Procedure CP/O/B/8600/19, Section 4.3, Preparation of Thiosulfate Solution for Post-Accident Gas Sampling.

3.0 Equipment

3.1 Equipment required per sample.

1 Nalgene 500 ml bottle of NaOH with accompanying vial of

$Na_2S_2O_3 \cdot 5H_2O$.

1 Nalgene 1000 ml thiosulfate sample bottle.

2 Stainless steel gas bombs.

1 9/16 inch combination wrench.

1 Poly bag.

1 Funnel.

1 Watch

NOTE: All above equipment is located in the Health Physics Shift Lab in the file drawer labelled "Post-Accident Gas Sampling Equipment". All equipment below is standard in the Chemistry Hot Lab.

1 Nalgene 60 ml bottle.

2 Rubber septums.

1 Syringe.

1 1000 ml graduated cylinder.

1 50 ml graduated cylinder

1 100 ml beaker

4.0 Time Required

4.1 Sampling must be completed in less than three (3) hours from the time a decision is made to take a sample.

4.2 The sampling cycle will require two (2) Health Physics Shift personnel approximately one (1) hour per sample, of which approximately ten (10) minutes will be spent in the sample panel area. One qualified Shift Technician will operate the control panel while the other will perform transit duties to and from the sample panel.

5.0 Limits and Precautions

5.1 Only the Station Health Physicist or his designee can authorize the use of this procedure when needed and should provide appropriate surveillance and control of personnel taking the samples. Entry and exit to sample panel and control panel area to be determined by HP Surveillance and Control.

5.2 Inform the Shift Supervisor that gas sampling will be performed and that one H_2 Analyzer will be inoperable during

sampling. The Shift Supervisor will be notified as to which H_2 Analyzer is in use per step 6.7.

5.3 Personnel communications can be achieved by using extension at location BB54 near the control panel.

5.4 The Trap Area Evacuation mode shall never be used.

5.5 The Fast Sample Dilution mode shall never be used.

5.6 The Sample Line Select Switch shall never be used.

5.7 The Recirc Pump must never be used at any pressure other than 0" of Hg.

5.8 Moving the Selector Switch from one mode to another stops all current system operations. Depressing the Activate pushbutton starts operation of the newly selected mode.

5.9 The Radiation Monitor on the control panel will provide background levels of radiation prior to, during, and after sampling, and an indication of contamination within the system or panel for progressive samples.

5.10 If the needle of the Radiation Monitor "pegs out" on the upper end of the meter scale while the lower scale (mr/hr) is being used, immediately turn the selector knob to the higher scale (r/hr).

5.11 If the Radiation Monitor reading cannot be reduced below 16 R/hr (see Enclosure 8.5, Table II) by purging the system with N_2, (see 7.1 steps 7.1.1 thru 7.1.12), do not return to the sample panel, but contact the Station Health Physicist immediately for further instructions.

5.12 If thiosulfate comes in contact with the skin during preparation (see 6.0, step 6.9), transferal (see 6.0, step 6.10), or dilution (see 7.0, steps 7.6.8, 7.6.9, and 7.6.11), wash the affected area as soon as possible with soap and lukewarm water.

5.13 Dilute samples in accordance with Health Physics practices for handling radioactive materials.

5.14 Treat and decontaminate all spills immediately.

5.15 Dispose of syringes, septums, rubber gloves, etc., in radwaste receptacles.

5.16 If problems with the radiation monitor are evident (i.e. no indication of radiation on the meter) contact IAE at extension for assistance. Turn the Selector Switch to the OFF mode and discontinue sampling until the problem is corrected. Once corrected, continue the procedure where left off.

5.17 If problems with the pressure and/or temperature gauges are evident (i.e. no indication on a meter or no variances during sampling) contact IAE at extension for assistance. Turn the Selector Switch to the OFF mode and discontinue sampling until the problem is corrected. Once corrected, continue the procedure where left off.

5.18 Projected dose rates from the TS and gas samples are listed on Enclosure 8.5, Table I, and sample panel transit area doses are listed on Enclosure 8.6.

6.0 Prerequisite System Conditions

Initial/Time

_____/_____ 6.1 Contact Operations at extension to verify that valve 1VI226 for VI supply to sample panel is open, and valve 1GN125 for N_2 supply to sample panel is open.

_____/_____ 6.2 Contact Chemistry at extension to verify that valve 1YM382 for DI supply to sample panel is open.

_____/_____ 6.3 Obtain Post-Accident Control Panel key and key #C415A from Health Physics RICE Lab(Room #940, level 767) key locker to unlock H_2 Monitor Panel (either train A or B) and verify that H_2 Monitor is in the Standby mode. If H_2 Monitor is not in the Standby mode, use the alternate train. The H_2 Monitor Panel train A is at location CC53 on level 750, and train B at CC53 on level 733.

_____/_____ 6.4 Open sample line inlet solenoid valve to divert containment atmosphere to the sample panel by depressing the black ON pushbutton located on the H_2 Monitor Panel under the Sample Routed to PAMS Panel label. Accompanying red power light should energize.

____/____ 6.5 Open sample line outlet solenoid valve by turning the Isolation Valve Open key lock switch, located on the H_2 Monitor Panel, to the ON position. Accompanying red power light should energize.

____/____ 6.6 Obtain containment atmosphere by turning Sample Location Selector, located on the H_2 Monitor Panel, to Pos. #1. Accompanying red power light should energize.

____/____ 6.7 Notify Shift Supervisor at extension . as to which train is in use.

____/____ 6.8 Obtain thiosulfate package from the file drawer labelled "Post-Accident Gas Sampling Equipment" in the Health Physics Shift Lab (Room #954, Level 767). The package consists of bottles labelled "2.42E-3 NaOH" with vials attached to the side labelled "0.3003 gm $Na_2S_2O_3 \cdot 5H_2O$."

____/____ 6.9 Prepare thiosulfate solution per chemistry procedure CP/0/B/8600/19, section 4.3, taking all precautions listed therein. (CP/0/B/8600/19 with sampling equipment in Shift Lab.)

____/____ 6.10 Use the funnel to pour contents into the thiosulfate tank, labelled "TS Tank", which is on top of the sample panel (location CC52, level 733). Leave the cap off of the TS Tank after transferring the thiosulfate.

____/____ 6.11 Verify that all four service valves are open before operation. These are the DI, VI, and N_2 valves located on the outside upper left side of the sample panel, and the TS valve located on the inside upper center of the sample panel. These valves are opened by rotating the black switches counter-clockwise one-quarter turn to the upward position.

NOTE: 6.12 thru 6.19 concern initial control panel settings. Control panel is at location CC53, level 750.

____/____ 6.12 The Sample Volume Select must be set on Small.

____/____ 6.13 The Dilution Volume Select must be set on Large.

____/____ 6.14 The Selector Switch must be in the Off position.

____/____ 6.15 Move the System Purge toggle switch to the Normal position.

____/____ 6.16 Move the Refill toggle switch to the Off (down) position.

____/____ 6.17 Turn the TC Switch to position 1, which is the thermocouple setting to measure sample line temperature. Position 2 will measure ambient temperature within the sample panel.

____/____ 6.18 Turn the Radiation Monitor On by moving the toggle switch (located below the meter) to the Up position.

____/____ 6.19 Turn the selector to BATT and verify that the needle is in the "red test region" on the right end of the scale. If reading is below the test region, contact LAE at extension for assistance. Do not continue until LAE verifies that the problem is corrected.

____/____ 6.20 Select the appropriate rate so that the needle is on the meter scale by first turning the selector knob to higher scale (r/hr) and, if necessary, to lower scale (mr/hr).

____/____ 6.21 Turn Key Lock Switch to Power On. Power on light should energize. If power on light does not energize, verify that breaker #41 on breaker panel 1KJ is closed to provide power to the system. The panel is at location MM56 on level 750. Contact Shift Supervisor before closing breaker.

7.0 Operating Procedure

NOTE: All steps in the operating procedure are momentary unless otherwise specified.

7.1 System Purge

____/____ 7.1.1 Turn Select Switch to System Purge.

____/____ 7.1.2 Move Normal-Sample Purge toggle switch to Sample Purge.

____/____ 7.1.3 Depress Activate pushbutton.

____/____ 7.1.4 Depress Evac pushbutton (Evac light should energize) and watch the pressure gauge slowly drop to -25" of Hg.

____/____ 7.1.5 When pressure reaches -25" of Hg, depress the Stop pushbutton.

____/____ 7.1.6 Press down and release the Gas Purge toggle switch and watch the pressure gauge rather swiftly rise to +10" of Hg.

____/____ 7.1.7 When pressure reaches +10" Hg, depress the Stop pushbutton.

____/____ 7.1.8 Depress the Activate and then the Evac pushbuttons and watch the pressure gauge drop to 0" of Hg.

____/____ 7.1.9 When pressure reaches 0" of Hg, depress the Stop pushbutton.

____/____ 7.1.10 Depress Pump pushbutton and wait for thirty (30) seconds.

____/____ 7.1.11 Depress Stop pushbutton.

____/____ 7.1.12 Repeat steps 7.1.3 thru 7.1.11 two (2) more times.

____/____ 7.1.13 Move Normal-Sample Purge toggle switch to Normal.

____/____ 7.1.14 Turn Selector Switch to Solution Changeout.

____/____ 7.1.15 Attach the TS sample bottle to the sample panel by inserting the plastic hose into the bottle which is located on the lower left side of the panel. Attach the gas sample bomb to the sample panel (using the 9/16" wrench) on the lower right side of panel.

____/____ 7.1.16 Record the Radiation Monitor reading as a background reference where specified on Enclosure for appropriate sample number.

____/____ 7.1.17 Record sample line temperature reading for sample volume calculations where specified on Enclosure for appropriate sample number. Proceed to section 7.2.

7.2 Solution Changeout

____/____ 7.2.1 Depress Activate pushbutton.

____/____ 7.2.2 Depress Flush pushbutton and hold thirty (30) seconds.

____/____ 7.2.3 Depress Purge pushbutton and hold thirty (30) seconds.

____/____ 7.2.4 Depress Empty pushbutton and hold for thirty (30) seconds.

____/____ 7.2.5 Move the Refill toggle switch to ON (up) position and wait two (2) minutes and then move toggle switch back to Off (down) position.

____/____ 7.2.6 Turn Selector Switch to Dilution Volume Evacuation and proceed to section 7.3.

7.3 Dilution Volume Evacuation

____/____ 7.3.1 Depress the Activate pushbutton and watch the pressure gauge drop to -25" of Hg.

____/____ 7.3.2 When pressure reaches -25" of Hg, turn Selector Switch to Sample Recirc and proceed to section 7.4.

7.4 Sample Recirc

____/____ 7.4.1 Depress Activate pushbutton and wait for five (5) minutes.

____/____ 7.4.2 Return to Sample Panel and note pressure gauge reading on sample inlet line.

____/____ 7.4.3 Record the pressure (P) where specified on Enclosure for appropriate sample number.

____/____ 7.4.4 Depress Sample pushbutton and wait for one (1) minute.

____/____ 7.4.5 Depress Trap pushbucton and wait for ten (10) seconds.

____/____ 7.4.6 Enter time of sample trap where specified on Enclosure for appropriate sample number.

____/____ 7.4.7 Turn Selector Switch to Sample Dilution and proceed to section 7.5.

7.5 Sample Dilution

____/____ 7.5.1 Depress Activate pushbutton.

____/____ 7.5.2 Depress Slow pushbutton and watch pressure gauge rise slowly to 0" of Hg.

____/____ 7.5.3 When pressure reaches 0" of Hg, depress the Stop pushbutton.

____/____ 7.5.4 Depress the Recirc pushbutton and wait for five (5) minutes.

____/____ 7.5.5 Return to the sample panel and close the gas sample bomb left valve, wait five (5) seconds and close the right valve.

____/____ 7.5.6 Return to control panel and depress the Stop pushbutton.

____/____ 7.5.7 Turn Selector Switch to Solution Changeout and proceed to section 7.6.

7.6 Samples Collection

____/____ 7.6.1 Depress Activate pushbutton.

____/____ 7.6.2 Simultaneously depress and hold the TS Sample pushbutton and the Empty pushbutton for five (5) minutes. TS should transfer into the TS sample bottle.

____/____ 7.6.3 Depress Purge pushbutton and hold one (1) minute.

____/____ 7.6.4 Depress TS Sample Grab pushbutton.

____/____ 7.6.5 Turn Selector Switch to System Purge and repeat steps 7.1.3 thru 7.1.11 as needed to reduce radiation levels within the sample panel to as near the background level (listed on appropriate Enclosure) as possible, or until no noticeable increase is observed on the Radiation Monitor from one N_2 purge to the next. Record the Radiation Monitor reading where specified on Enclosure for appropriate sample number.

____/____ 7.6.6 Tightly cap the TS sample bottle and disconnect the gas sample bomb (using the 9/16" wrench) from the sample panel. Leave the wrench on top of the sample panel. Radioactive sources are

to be handled according to Section 13.1 of the Station Health Physics Manual.

____/____ 7.6.7 Place the TS Sample Bottle and the gas sample bomb into the poly bag and carry at arms length (away from the body) to the Chemistry Hot Lab (Room #1105, level 775). Place the samples in the designated shielded area provided for hot samples.

____/____ 7.6.8 Transfer the thiosulfate solution into a 1000 ml graduated cylinder to determine the thiosulfate dilution volume (TDV). Record this value where specified on the Enclosure for the appropriate sample number. Use standard chemistry laboratory techniques, and precautions per Chemistry procedure CP/0/A/8200/05, Enclosure 6.3 (Enclosure is posted in the Hot Lab).

____/____ 7.6.9 Transfer fifty (50) ml of the thiosulfate sample into a sixty (60) ml Nalgene bottle using techniques and precautions referenced in 7.6.8. Tighten cap onto the sample bottle.

____/____ 7.6.10 Transfer the prepared thiosulfate sample and gas sample bomb to the H.P. Count Room (Room #947A, level 768) for analysis. Samples will be analyzed per Station H.P. Manual, Section 12.1, Operating Procedure for the Nuclear Data 6600 GeLi System. Sample data on the appropriate Enclosure of this procedure will be required for analysis.

____/____ 7.6.11 If additional sample dilution is required for GeLi counting, perform the dilutions in the Chemistry Hot Lab per techniques and precautions referenced in Section 7.6.8, until samples are suitable for analysis. Dilution factors used will be determined by the Count Room Supervisor or his designee, and values

inserted where specified on Enclosure for the appropriate sample number.

____/____ 7.6.12 Excess samples are to be disposed of per guidelines referenced in 7.6.8.

____/____ 7.6.13 If another containment air sample is needed, repeat Steps 6.8 thru 6.10 and begin procedure at Section 7.1.

____/____ 7.6.14 If no additional containment air samples are needed, turn Selector Switch to Off.

____/____ 7.6.15 Turn Key Lock Switch to Off.

____/____ 7.6.16 Close sample line valves by depressing Off pushbutton on H_2 Monitor Panel. The pushbutton is under the Sample Routed to PAMS Panel label.

____/____ 7.6.17 Close sample line outlet solenoid valve by turning the Isolation Valve Open key lock switch, located on the H_2 Monitor Panel, to the OFF position.

____/____ 7.6.18 Turn Sample Location Selector, located on the H_2 Monitor Panel, to OFF. Lock H_2 Monitor Panel.

____/____ 7.6.19 Close all four (4) service valves by turning one-quarter turn clockwise.

____/____ 7.6.20 Notify Shift Supervisor of sampling completion and that the H_2 Analyzer used during sampling is operable.

____/____ 7.6.21 Notify the Station Health Physicist when sample analyses are complete.

8.0 Enclosures

8.1 Sample 1 Data Sheet

8.2 Sample 2 Data Sheet

8.3 Sample 3 Data Sheet

8.4 Sample 4 Data Sheet

8.5 Table I - Projected Dose Rates from TS Sample and Gas Sample
Table II - Maximum Allowable Dose Rate in Sample Panel Area

8.6 Projected Doses from Sample Panel Transit Area

Enclosure 8.1

Sample 1 Data Sheet

Name:

Date:

Time of Sample Trap:

Time of Thiosulfate Sample Analysis:

Time of Gas Sample Analysis:

Radiation Monitor Reading per 7.1.16:

Radiation Monitor Reading per 7.6.5:

Sample Line Temperature (°F):

(TC Position 1 Only)

$$\text{Sample Volume} = SV = (1.3\text{cc}) \Big/ \left[\frac{293 + (5/9)(\quad °F - 32)}{293} \quad \frac{(14.7 + P \text{ "Hg})}{14.7} \right]$$

$$= \_\_\_\_\_ \text{ cc}$$

$$\text{First Thiosulfate Dilution Factor} = TDF_1 = \frac{SV}{TDV}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

$$\text{Second Thiosulfate Dilution Factor} = TDF_2 = \frac{(TDF_1)\ (\text{x ml of sample})}{(\text{y ml of DI water})}$$

(If necessary-determined by Count Room Supervisor or his designee)

$$= \frac{(\quad)(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

First Gas Dilution Factor = $GDF_1 = \frac{SV}{10^4}$

$= \frac{(\quad)}{10^4}$

$= \_\_\_\_$

Second Gas Dilution Factor = $GDF_2 = \frac{(GDF_1)(x \text{ cc of sample})}{(y \text{ cc container volume})}$
(If necessary–determined by Count Room Supervisor or his designee)

$= \frac{(\quad)(\quad)}{(\quad)}$

$= \_\_\_\_\_$

Enclosure 8.2

Sample 2 Data Sheet

Name:

Date:

Time of Sample Trap:

Time of Thiosulfate Sample Analysis:

Time of Gas Sample Analysis:

Radiation Monitor Reading per 7.1.16:

Radiation Monitor Reading per 7.6.5:

Sample Line Temperature (°F):

(TC Position 1 Only)

$$\text{Sample Volume} = SV = (1.3\text{cc}) \Big/ \left[\frac{293 + (5/9)(\quad °F - 32)}{293} \quad \frac{(14.7 + P \quad \text{"Hg})}{14.7} \right]$$

$$= \_\_\_\_\_ \text{ cc}$$

$$\text{First Thiosulfate Dilution Factor} = TDF_1 = \frac{SV}{TDV}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

$$\text{Second Thiosulfate Dilution Factor} = TDF_2 = \frac{(TDF_1)\ (\text{x ml of sample})}{(\text{y ml of DI water})}$$

(If necessary–determined by Count Room Supervisor or his designee)

$$= \frac{(\quad)(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

First Gas Dilution Factor = $GDF_1 = \frac{SV}{10^4}$

$= \frac{(\quad)}{10^4}$

$= \_\_\_\_$

Second Gas Dilution Factor = $GDF_2 = \frac{(GDF_1)(x \text{ cc of sample})}{(y \text{ cc container volume})}$
(If necessary–determined by Count Room Supervisor or his designee)

$= \frac{(\quad)(\quad)}{(\quad)}$

$= \_\_\_\_\_$

Enclosure 8.3

Sample 3 Data Sheet

Name:

Date:

Time of Sample Trap:

Time of Thiosulfate Sample Analysis:

Time of Gas Sample Analysis:

Radiation Monitor Reading per 7.1.16:

Radiation Monitor Reading per 7.6.5:

Sample Line Temperature (°F):

(TC Position 1 Only)

$$\text{Sample Volume} = SV = (1.3\text{cc}) \Big/ \left[\frac{293 + (5/9)(\quad °F - 32)}{293} \quad \frac{(14.7 + P \quad \text{"Hg})}{14.7} \right]$$

$$= \_\_\_\_\_ \text{ cc}$$

$$\text{First Thiosulfate Dilution Factor} = TDF_1 = \frac{SV}{TDV}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \_\_\_\_$$

$$\text{Second Thiosulfate Dilution Factor} = TDF_2 = \frac{(TDF_1)\ (\text{x ml of sample})}{(\text{y ml of DI water})}$$

(If necessary-determined by Count Room Supervisor or his designee)

$$= \frac{(\quad)(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

First Gas Dilution Factor = $GDF_1 = \frac{SV}{10^4}$

$= \frac{(\quad)}{10^4}$

$= \_\_\_\_$

Second Gas Dilution Factor = $GDF_2 = \frac{(GDF_1)(x \text{ cc of sample})}{(y \text{ cc container volume})}$
(If necessary–determined by Count Room Supervisor or his designee)

$= \frac{(\quad)(\quad)}{(\quad)}$

$= \_\_\_\_\_$

Enclosure 8.4

Sample 4 Data Sheet

Name:

Date:

Time of Sample Trap:

Time of Thiosulfate Sample Analysis:

Time of Gas Sample Analysis:

Radiation Monitor Reading per 7.1.16:

Radiation Monitor Reading per 7.6.5:

Sample Line Temperature (°F):

(TC Position 1 Only)

$$\text{Sample Volume} = SV = (1.3\text{cc}) \Big/ \left[\frac{293 + (5/9)(\quad °F - 32)}{293} \quad \frac{(14.7 + p \quad \text{"Hg})}{14.7} \right]$$

$$= \_\_\_\_\_ \text{ cc}$$

$$\text{First Thiosulfate Dilution Factor} = TDF_1 = \frac{SV}{TDV}$$

$$= \frac{(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

$$\text{Second Thiosulfate Dilution Factor} = TDF_2 = \frac{(TDF_1)\ (x \text{ ml of sample})}{(y \text{ ml of DI water})}$$

(If necessary-determined by Count Room Supervisor or his designee)

$$= \frac{(\quad)(\quad)}{(\quad)}$$

$$= \_\_\_\_\_$$

First Gas Dilution Factor = $GDF_1 = \frac{SV}{10^4}$

$= \frac{(\quad)}{10^4}$

$= \_\_\_\_$

Second Gas Dilution Factor = $GDF_2 = \frac{(GDF_1)(x \text{ cc of sample})}{(y \text{ cc container volume})}$
(If necessary-determined by Count Room Supervisor or his designee)

$= \frac{(\quad)(\quad)}{(\quad)}$

$= \_\_\_\_\_$

Enclosure 8.5

Table I

Gas Sample Dose Rates

Time Post-Accident (Hours)

Distance	0	1	2
at 1"	2.00E3 mr/hr	1.66E3 mr/hr	4.00E2 mr/hr
at 36"	2.08E0 mr/hr	1.63E0 mr/hr	3.73E-1 mr/hr

Thiosulfate Sample Bottle Dose Rates

Time Post-Accident (Hours)

Distance	0	1	2
at 1"	1.32E4 mr/hr	1.06E4 mr/hr	4.7E3 mr/hr
at 36"	1.93E1 mr/hr	1.55E1 mr/hr	6.88E0 mr/hr

NOTE: $2.00E3 = 2.00 \times 10^3$

Table II

In reference to Section 5.10:

1 minute transit to and from sample panel

10 minutes at sample panel

$$(x \frac{R}{hr})(\frac{11}{60} \text{ hr.}) = 3 R$$

$$x = 16.36 \frac{R}{hr}$$

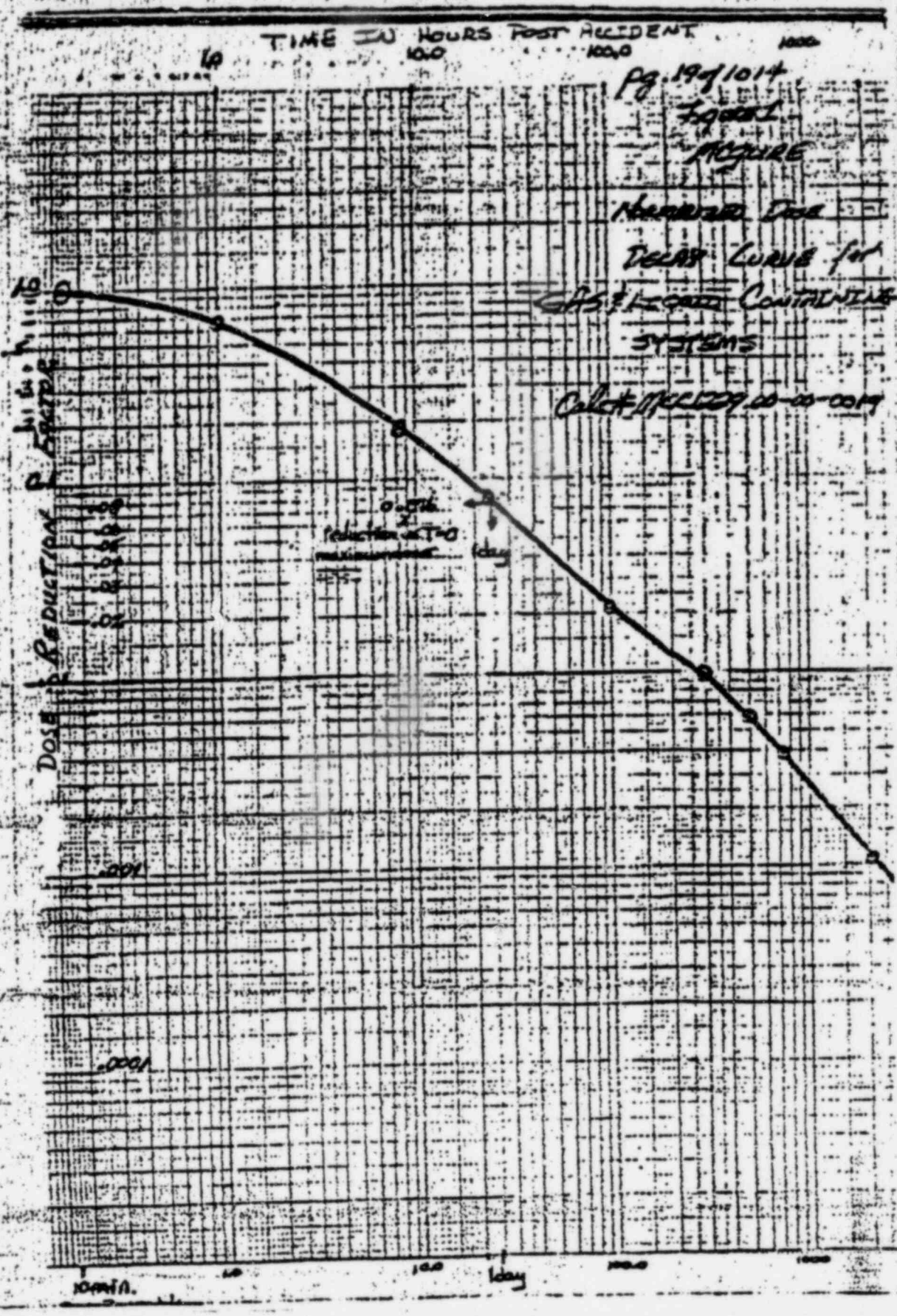
$$x = 16 \frac{R}{hr}$$

Time Post-Accident (Hours)	Dose (R)
0	3.041
1	1.977
2	1.429
3	1.125
4	0.912
5	0.821
10	0.517
24	0.231

NOTE: Any dose at a time not listed can be determined by cross-referencing on the graph. (Graph on next page).

The vertical axis is the fraction of the Time = 0 dose.

The horizontal axis is the time in hours post-accident.


TIME IN HOURS POST ACCIDENT
1.0
10.0
100.0
1000
Pg. 19 of 1014
Figure
Normalized Dose
Decay Curve for
Gas & Liquid Containing
Systems
Calc # NC1209.00-00-0014
DOSE REDUCTION FACTOR
10
1.0
.1
.01
.001
.0001
0.276
Reduction at T=0
1 day
10 min.
1.0
10.0
1 day
100.0
1000

Form SPD-1002-1

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1009/16
Change(s) 0 to
0 Incorporated

(2) STATION: McGuire Nuclear Station

(3) PROCEDURE TITLE: Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release

(4) PREPARED BY: Scott E. Jorenson DATE: 21 April 82

(5) REVIEWED BY: [signature] DATE: 27 APR 82

Cross-Disciplinary Review By: _____ N/R: X

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: Tony L. McConnell Date: 4/29/82

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

HP/O/B/1009/16

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
DISTRIBUTION OF POTASSIUM IODIDE TABLETS
IN THE EVENT OF A RADIOIODINE RELEASE

1.0 Purpose

This procedure provides information necessary to distribute Active Potassium Iodide (KI) tablets to inplant personnel in the event of a release of radioiodine. Also, it outlines storage and supply information to assure sufficient quality and quantity of thyroid blocking material.

2.0 References

2.1 NCRP Report No. 55; Protection of the Thyroid Gland in the Event of Releases of Radioiodine 1977.

2.2 NCRP Report No. 65; Management of Persons Accidentally Contaminated with Radioiodine 1980.

2.3 BRH Report; Recommendations of Thyroid Blocking EKI, HHS Pub. FDA 81-8158.

2.4 System Health Physics Manual.

2.5 NUREG 0654.

3.0 Limits and Precautions

3.1 Persons who are known to be allergic to KI shall not receive these tablets.

3.2 Nursing mothers who receive KI tablets shall be advised to use nutrient substitutes (ex. milk or a formula) for children for the duration of the ten-day tablet use period.

3.3 Personnel shall be advised not to deviate from prescribed dosages and dosage rates.

3.4 Best results will be achieved when KI tablets are administered immediately (within 2 hours) after an exposure, although administration as late as 24 hours after an emergency will be of limited value.

3.5 Discolored or disfigured tablets and bottles of KI with loose tops shall be discarded.

3.6 Hands of personnel shall be free from contamination prior to taking KI tablets.

4.0 Procedure

4.1 Responsibilities for Distribution

4.1.1 Station personnel suspected of having been in the affected area prior to detection and during the release, personnel present in the affected area, and personnel who will enter the area while radioiodine is present shall be instructed by the Station Health Physicist to report immediately and register in a KI distribution area.

4.1.2 KI shall be distributed only to prevent a significant uptake of radioiodine. A "significant uptake" is defined as follows:

4.1.2.1 That amount that would otherwise result in a dose commitment of greater than or equal to the quarterly permissable occupational dose.

4.1.2.2 Exposure to greater than or equal to 10 x MPC or more when the exposure to expected persist for one or more days.

4.2 Registration of Persons Exposed to Radioiodine

4.2.1 When persons notified by Health Physics arrive at a distribution area, record appropriate data per Enclosure 5.1.

4.2.2 The Station Health Physicist or his designee should give one (1) tablet to each affected person and instructions concerning the use of the tablet. Then issue to each affected person one bottle containing nine (9) KI tablets, and the package insert for the use of the tablets (refer to Enclosure 5.2 for an example of the package insert).

4.2.2.1 A sufficient quantity of small sample bottles shall be supplied in each emergency kit to permit ample distribution of tablets.

4.2.2.2 Tablets are to be taken only as directed. One (1) tablet per day for ten (10) days is the recommended dosage.

4.2.2.3 After the initial dose of KI, subsequent doses shall be taken on a daily basis. Tablets should be taken as near a 24-hour schedule as possible.

NOTE: For best results, emphasis shall be placed upon the proper use of these tablets.

4.2.3 Tablets removed from full bottles of KI should be stored in small plastic sample bottles. The expiration date on the bottle from which the tablets were taken and the name of the Health Physics representative shall be recorded on the small bottles. Tablets stored in small plastic sample bottles should then be used for the single tablet initial issuance of KI to affected persons.

4.3 Thyroid Burden Analysis Following Radioiodine Exposure

4.3.1 All personnel receiving KI tablets should receive a thyroid scan. If the number of people render this step impractical, the Count Room Supervisor should draw a representative sample of persons listed on Enclosure 5.1 who received KI tablets.

NOTE: Subsequent action involving thyroid burden analysis should follow guidelines established in the System Health Physics Manual.

4.3.2 Records of thyroid scan should be maintained per procedure.

NOTE: Thyroid scans immediately after an accident could lengthen KI distribution time and cause confusion among personnel. Distribute KI before analyzing thyroid concentration.

4.4 Storage Requirements

4.4.1 There are three major storage requirements to be observed:

4.4.1.1 Store in a temperature range of 59 to 86 degrees F.

4.4.1.2 Store in a low humidity area (avoid direct exposure to liquids).

4.4.1.3 Store in an area protected from exposure to light.

4.4.2 Upon receiving a shipment of KI, boxes should be opened as soon as possible and bottles examined to ensure that an airtight seal has been maintained. Bottles shall be returned to boxes, and boxes shall be sealed shut, so as to avoid exposure to light.

4.4.3 To ensure a sufficient supply of tablets, a minimum of 961 bottles with 14 tablets per bottle should be maintained.

4.5 Shelf Life and Changeout of KI Tablets

4.5.1 Thryo Block ™ tablet bottles are labelled with an expiration date from the factory. As tablets reach the expiration dates, the tablets shall be discarded, unless the pharmaceutical company extends the expiration date, authorized by the FDA.

NOTE: Replacement tablets should be ordered at least three (3) months prior to the date of expiration listed on the bottles of KI.

4.5.2 Upon receiving a shipment of KI tablets, supplies should be shifted so as to use older tablets before new tablets.

4.5.3 After the radioiodine emergency, tablets in the small plastic sample bottles shall be discarded.

5.0 Enclosures

5.1 Potassium Iodide Tablet Distribution Data Sheet

5.2 Package Insert for Thyro-Block™ Tablets and Solution

5.3 KI Storage Location List and Distribution

ENCLOSURE 5.1

POTASSIUM IODIDE TABLET DISTRIBUTION DATA SHEET

HP BADGE NUMBER	NAME	DEPARTMENT	DATE & TIME OF SUSPECTED EXPOSURE	DATE & TIME OF INITIAL ISSUANCE

ENCLOSURE 5.2

PACKAGE INSERT FOR THYRO-BLOCK™ TABLETS AND SOLUTION

Patient Package Insert For

THYRO-BLOCK™

(POTASSIUM IODIDE)
(pronounced poe-TASS-e-um EYE-on-dyed)
(abbreviated: KI)
TABLETS and SOLUTION U.S.P.

TAKE POTASSIUM IODIDE ONLY WHEN PUBLIC HEALTH OFFICIALS TELL YOU. IN A RADIATION EMERGENCY, RADIOACTIVE IODINE COULD BE RELEASED INTO THE AIR. POTASSIUM IODIDE (A FORM OF IODINE) CAN HELP PROTECT YOU.

IF YOU ARE TOLD TO TAKE THIS MEDICINE, TAKE IT ONE TIME EVERY 24 HOURS. DO NOT TAKE IT MORE OFTEN. MORE WILL NOT HELP YOU AND MAY INCREASE THE RISK OF SIDE EFFECTS. *DO NOT TAKE THIS DRUG IF YOU KNOW YOU ARE ALLERGIC TO IODIDE.* (SEE SIDE EFFECTS BELOW.)

INDICATIONS

THYROID BLOCKING IN A RADIATION EMERGENCY ONLY.

DIRECTIONS FOR USE

Use only as directed by State or local public health authorities in the event of a radiation emergency.

DOSE

Tablets:	ADULTS AND CHILDREN 1 YEAR OF AGE OR OLDER: One (1) tablet once a day. Crush for small children. BABIES UNDER 1 YEAR OF AGE: One-half (1/2) tablet once a day. Crush first.
Solution:	ADULTS AND CHILDREN 1 YEAR OF AGE OR OLDER: Add 6 drops to one-half glass of liquid and drink each day. BABIES UNDER 1 YEAR OF AGE: Add 3 drops to a small amount of liquid once a day.

For all dosage forms: Take for 10 days unless directed otherwise by State or local public health authorities.

Store at controlled room temperature between 15° and 30°C (59° to 86°F). Keep container tightly closed and protect from light. Do not use the solution if it appears brownish in the nozzle of the bottle.

WARNING

Potassium iodide should not be used by people allergic to iodide. Keep out of the reach of children. In case of overdose or allergic reaction, contact a physician or the public health authority.

DESCRIPTION

Each THYRO-BLOCK™ TABLET contains 130 mg of potassium iodide.

Each drop of THYRO-BLOCK™ SOLUTION contains 21 mg of potassium iodide.

ENCLOSURE 5.2

HOW POTASSIUM IODIDE WORKS

Certain forms of iodine help your thyroid gland work right. Most people get the iodine they need from foods, like iodized salt or fish. The thyroid can "store" or hold only a certain amount of iodine.

In a radiation emergency, radioactive iodine may be released in the air. This material may be breathed or swallowed. It may enter the thyroid gland and damage it. The damage would probably not show itself for years. Children are most likely to have thyroid damage.

If you take potassium iodide, it will fill-up your thyroid gland. This reduces the chance that harmful radioactive iodine will enter the thyroid gland.

WHO SHOULD NOT TAKE POTASSIUM IODIDE

The only people who should not take potassium iodide are people who know they are allergic to iodide. You may take potassium iodide even if you are taking medicines for a thyroid problem (for example, a thyroid hormone or antithyroid drug). Pregnant and nursing women and babies and children may also take this drug.

HOW AND WHEN TO TAKE POTASSIUM IODIDE

Potassium Iodide should be taken as soon as possible after public health officials tell you. You should take one dose every 24 hours. More will not help you because the thyroid can "hold" only limited amounts of iodine. Larger doses will increase the risk of side effects. You will probably be told not to take the drug for more than 10 days.

SIDE EFFECTS

Usually, side effects of potassium iodide happen when people take higher doses for a long time. You should be careful not to take more than the recommended dose or take it for longer than you are told. Side effects are unlikely because of the low dose and the short time you will be taking the drug.

Possible side effects include skin rashes, swelling of the salivary glands, and "iodism" (metallic taste, burning mouth and throat, sore teeth and gums, symptoms of a head cold, and sometimes stomach upset and diarrhea).

A few people have an allergic reaction with more serious symptoms. These could be fever and joint pains, or swelling of parts of the face and body and at times severe shortness of breath requiring immediate medical attention.

Taking iodide may rarely cause overactivity of the thyroid gland, underactivity of the thyroid gland, or enlargement of the thyroid gland (goiter).

WHAT TO DO IF SIDE EFFECTS OCCUR

If the side effects are severe or if you have an allergic reaction, stop taking potassium iodide. Then, if possible, call a doctor or public health authority for instructions.

HOW SUPPLIED

THYRO-BLOCK™ TABLETS (Potassium Iodide, U.S.P.) bottles of 14 tablets (NDC 0037-0472-20.) Each white, round, scored tablet contains 130 mg potassium iodide.

THYRO-BLOCK™ SOLUTION (Potassium Iodide Solution, U.S.P.) 30 ml (1 fl. oz.) light-resistant, measured-drop dispensing units (NDC 0037-4287-25). Each drop contains 21 mg potassium iodide.

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Enclosure 5.3

POTASSIUM IODINE LOCATION AND DISTRIBUTION LIST

(1)	Cowan's Ford Dam (2 kits)	477 bottles
(2)	Control Room	150 bottles
(3)	Station Manager's Office	150 bottles
(4)	Training & Technology Center (2 kits)	152 bottles
(5)	Environmental Survey Kits (4 kits)	4 bottles
(6)	Construction Post #1	1 bottle
(7)	Brass Shack	1 bottle
(8)	PAP Area	1 bottle
(9)	Technical Support Center Kit	25 bottles
	TOTALS	961 bottles