

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: RP/O/A/5000/02
Change(s) 3 to
4 Incorporated

- (2) STATION: CATAWBA
- (3) PROCEDURE TITLE: NOTIFICATION OF UNUSUAL EVENT
- (4) PREPARED BY: Mike Bolek DATE: 2-15-85
- (5) REVIEWED BY: Peter LeRoy DATE: 2-15-85
- Cross-Disciplinary Review By: J. L. Fugman 2/18/85 N/R: _____
- (6) TEMPORARY APPROVAL (IF NECESSARY):
- By: _____ (SRO) Date: _____
- By: _____ Date: _____
- (7) APPROVED BY: J. L. Fugman Date: 2/18/85
- (8) MISCELLANEOUS:
- Reviewed/Approved By: _____ Date: _____
- Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
NOTIFICATION OF UNUSUAL EVENT

1.0 SYMPTOMS

- 1.1 This condition exists when 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 Make initial notifications to individuals and organizations.

- 2.1.1 Complete Enclosure 4.2 and Part I of Warning Message Form. (See example Enclosure 4.3.) Record receivers name and time (initial contact).

NOTE: Emergency Coordinator shall initial forms when message is approved for transmission.

NOTE: Warning Message Forms are kept in a notebook in the Control Room and TSC, ensure that all used forms are returned to the back of the notebook.

- 2.1.2 Notifications shall be as the order of Enclosure 4.1 indicates. See RP/0/B/5000/13 for NRC Notification.

NOTE: The State and County notification must be made within 15 minutes of declaration of the emergency.

3.0 SUBSEQUENT ACTIONS

- 3.1 Close out or Follow up Notifications.

- 3.1.1 Close out the Emergency with a follow-up message

OR

- 3.1.2 Give follow-up messages to agencies listed in 4.1.3 of Enclosure 4.1, use the following schedule:

- If the Unusual Event Situation lasts longer than one hour, then repeat each hour until closed out.

OR

- If there is any significant change to the situation.

OR

- As agreed upon with the individual agencies.

NOTE: The close out message shall be made approximately 30 minutes after the last transmitted message. Indicate on the message form, Part I #11b. that this is a close out message.

- 3.2 Augment shift resources to assess and respond to the emergency situation as needed.
- 3.3 Assess the emergency condition, then remain in a Notification of Unusual Event, escalate to a more severe class or terminate the emergency.
- 3.4 The Compliance Engineer or delegate shall follow up with a written summary to county and state authorities, notified in 4.1.3 of Enclosure 4.1, within 24 hours.

4.0 ENCLOSURES

- 4.1 Telephone Notification List
- 4.2 Emergency Message Format
- 4.3 Example Warning Message: Nuclear Facility to State/Local Government

TELEPHONE
NOTIFICATION LIST

4.1.1	<u>CNS Emergency Personnel</u>	Initial
1.	Operations Duty Engineer - Plant Page P & T Pager - [REDACTED] A: See Current Operations Work List for Home Phone Number.	_____
2.	Station Manager - J. W. Hampton Office [REDACTED] Home - [REDACTED] 1st Alternate - C. W. Graves Office [REDACTED] Home [REDACTED] 2nd Alternate - J. W. Cox Office [REDACTED] Home [REDACTED] 3rd Alternate - G. T. Smith Office [REDACTED] Home [REDACTED] 4th Alternate - B. F. Caldwell Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____ _____ _____ _____ _____
3.	Compliance Engineer - C. L. Hartzell Office [REDACTED] Home [REDACTED] 1st Alternate - M. E. Bolch Office [REDACTED] Home [REDACTED] 2nd Alternate - P. G. LeRoy Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____ _____
4.1.2	<u>Nuclear Production Duty Engineer</u> P & T Pager - [REDACTED] ** USE ENCLOSURE 4.2 **	_____

4.1.3 State & County Warning Points (Within 15 minutes)

1. N.C. State, Raleigh

*** USE ENCLOSURE 4.3 ***

2. S.C. State, Columbia

P: 7:30 a.m. - 5:00 p.m. Weekdays
A: After hours, Weekends & Holidays

*** USE ENCLOSURE 4.3 ***

3. Mecklenburg County

P: Selective Signal

A:

Back-up: Emergency Radio, Code:

*** USE ENCLOSURE 4.3 ***

4. York County

P: Selective Signal

A:

Back-up: Emergency Radio, Code:

*** USE ENCLOSURE 4.3 ***

5. Gaston County

P: Selective Signal

A:

Back-up: Emergency Radio, Code

*** USE ENCLOSURE 4.3 ***

4.1.4 NRC Operations Center, Bethesda, Md. (RP/0/B/5000/13)

P: ENS phone (red phone)

A:

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
TO NUCLEAR PRODUCTION DUTY ENGINEER
EMERGENCY MESSAGE FORMAT

1. This is _____ at Catawba Nuclear Station.
(Name and Title)

2. This _____ is _____ is not a drill. An ☒ Unusual Event
_____ Alert
_____ Site Area Emergency
_____ General Emergency

was declared by the Emergency Coordinator at _____ on Unit # _____.
(Time)

3. Initiating Condition: (Give as close to the emergency plan description as possible together with station parameters used to determine emergency status.)

4. Corrective measures being taken: _____

5. There _____ have _____ have not not been any injuries to plant personnel.

6. Release of radioactivity: _____ is taking place
_____ is not taking place

7. NRC _____ Yes _____ No; State _____ Yes _____ No;
Counties _____ Yes _____ No; have been notified.

8. The Crisis Management Team _____ should _____ should not be activated.
Corporate Communications and Company Management should be notified.

9. I can be reached at _____ for follow-up information.
(Telephone Number)

10. Additional Comments: _____

Name of Person Contacted _____ Date _____ Time _____

EXAMPLE

WARNING MESSAGE: NUCLEAR FACILITY TO STATE/LOCAL GOVERNMENT

Instructions:

A. For Sender:

1. Complete Part I for the Initial Warning Message.
2. Complete Parts I & II for follow-up messages.

B. For Receiver:

1. Record the date, time and your name in the area below.
2. Authenticate this message by verifying the code word or by calling back to the facility. (See Part 1.5)

Time: _____ Date: _____

Message Received By: _____

PART I

1. This is: Catawba Nuclear Station
2. My name is: John Doe, Shift Supervisor
3. This message (number 1):
- X (a) Reports a real emergency.
- (b) Is an exercise message.
4. My telephone number/extension is: [REDACTED]
5. Message authentication: USE MESSAGE AUTHENTICATION LIST
(Verify code word or call back to facility)
6. The class of the emergency is: X (a) Notification of Unusual Event
- (b) Alert
- (c) Site Emergency
- (d) General Emergency
7. This classification of emergency was declared at: (a.m./p.m.) on (date).
8. The initiating event causing the emergency classification is: Loss of Offsite Power
9. The emergency condition: X (a) Does not involve the release of radioactive materials from the plant.
- (b) Involves the potential for a release, but no release is occurring.
- (c) Involves a release of radioactive material.

10. We recommend the following protective action:

- X (a) No protective action is recommended at this time.
- (b) People living in zones _____ remain indoors with the 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
- X (b) No further communications Approved for Release

12. I repeat, this message:

- X (a) Reports an actual emergency Emerg. Coord. Time
- (b) Is an exercise message

13. RELAY THIS INFORMATION TO THE PERSONS INDICATED ON YOUR ALERT PROCEDURE FOR AN INCIDENT AT A NUCLEAR FACILITY.

END OF INITIAL WARNING MESSAGE

PART II

1. The type of actual or projected release is: N/A

- (a) Airborne
- (b) Waterborne
- (c) Surface spill
- (d) Other

2. The source and description of the release is: N/A

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

- N/A (b) The estimated duration of the release is _____ hours.

4. Dose projection base data:

Radiological release: N/A curies, or curies/sec.
Windspeed: 5 mph
Wind direction: From 180 °
Stability class: D (A, B, C, D, E, F, or G)
Release height: N/A Ft.
Dose conversion factor: N/A R/hr/Ci/m³ (whole body)
N/A R/hr/Ci/m³ (Child Thyroid)
Precipitation: 0
Temperature at the site: 72 °F

5. Dose projections: N/A

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): N/A

7. Emergency actions underway at the facility include: N/A

8. Onsite support needed from offsite organizations: NONE

9. Plant status:

- (a) Reactor is: not tripped/tripped
(b) Plant is at: 100 % power/hot shutdown/cold shutdown/cooling down
(c) Prognosis is: stable/improving/degrading/unknown

10. I repeat, this message:

 X (a) Reports an actual emergency.

Approved for Release

_____ (b) Is an exercise message.

[illegible]

11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

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

Record the name, title, date, time, and persons notified per alert procedure. (Receivers)

1. _____
(name) (title)

[illegible]

2. _____
(name) (title)

[illegible]

3. _____
(name) (title)

(date) (time) (warning point)

4. _____
(name) (title)

[illegible]

5. _____
(name) (title)

[illegible]

6.

(name)	(title)
--------	---------

(date) (time) (warning point)

7. _____
(name) (title)

(date) (time) (warning point)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: RP/O/A/5000/03
Change(s) 3 to
4 Incorporated

(2) STATION: CATAWBA

(3) PROCEDURE TITLE: ALERT

(4) PREPARED BY: Mike Bolch DATE: 2-15-85

(5) REVIEWED BY: Peter Leroy DATE: 2-15-85

Cross-Disciplinary Review By: J.R. Tamm 2/18/85 N/R: _____

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: J. L. Cox Date: 2/18/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA 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 ACTIONS

- 2.1 Make initial notifications to individuals and organizations.

- 2.1.1 Complete Enclosure 4.2 and Part I of Warning Message Form (see example Enclosure 4.3). Record receiver's name and time (initial contact).

NOTE: Emergency Coordinator shall initial forms when message is approved for transmission.

NOTE: Warning Message forms are kept in a Notebook in the Control Room and TSC, ensure that all used forms are returned to the back of the notebook.

- 2.1.2 Notifications shall be as the order of Enclosure 4.1 indicates. See RP/0/B/5000/13 for NRC Notification.

NOTE: The State and County notification must be made within 15 minutes of declaration of the emergency.

- 2.1.3 Advise station personnel to activate TSC and OSC.

- 2.1.4 Advise the Nuclear Production Duty Engineer to bring the CMC to standby.

3.0 SUBSEQUENT ACTIONS

- 3.1 Accident Assessment:

- 3.1.1 Dispatch on site monitoring teams with associated communications equipment, see HP/0/B/1009/09.

- 3.2 Follow up Notifications.

- 3.2.1 Give Follow-up Messages to offsite agencies listed on 4.1.3 of Enclosure 4.1, use the following schedule:

- Every half hour until the emergency is closed out.

or

- If there is any significant change to the situation.

or

- As agreed upon with the individual agencies.

3.2.2 Use parts 1 & 11 of Warning Message Form as applicable.
Mark all spaces "N/A" when information is "Not Applicable"
and mark "Later" when information is not currently available.

3.3 Recommend Protective Action Offsite

NOTE

Protective Action Recommendations are obtained from: OAC
Program "Nuclear-23" or RP/0/A/5000/11, if the OAC is not
operational, for Operations Personnel.

- 3.4 If the emergency situation is rapidly degrading then conduct a Site Assembly, see RP/0/A/5000/10.
- 3.5 Augment shift resources to assess and respond to the emergency situation as needed.
- 3.6 Assess the emergency condition, then remain in an Alert, escalate to a more severe class, reduce the Emergency Class or close out the emergency.
- 3.7 The Compliance Engineer or delegate shall close out the emergency with verbal summary to county and state authorities, notified in 4.1.3 of Enclosure 4.1, followed by written summary within 8 hours.

4.0 ENCLOSURES

- 4.1 Telephone Notification List
- 4.2 Emergency Message Format
- 4.3 Example Warning Message: Nuclear Facility to State/Local Government

TELEPHONE
NOTIFICATION LIST

4.1.1	<u>CNS Emergency Personnel</u>	Initial
1.	Operations Duty Engineer - Plant Page P & T Pager [REDACTED] A: See Current Operations Work List for Home Phone Number.	_____
2.	Station Manager - J. W. Hampton Office [REDACTED] Home - [REDACTED] 1st Alternate - C. W. Graves Office [REDACTED] Home [REDACTED] 2nd Alternate - J. W. Cox Office [REDACTED] Home [REDACTED] 3rd Alternate - G. T. Smith Office [REDACTED] Home [REDACTED] 4th Alternate - B. F. Caldwell Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____ _____ _____ _____ _____
3.	Compliance Engineer - C. L. Hartzell Office [REDACTED] Home [REDACTED] 1st Alternate - M. E. Bolch Office [REDACTED] Home [REDACTED] 2nd Alternate - P. G. LeRoy Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____ _____ _____
4.1.2	<u>Nuclear Production Duty Engineer</u> P & T Page [REDACTED] ** USE ENCLOSURE 4.2 **	_____

4.1.3 State & County Warning Points (Within 15 minutes)

1. N.C. State, Raleigh
[REDACTED]
*** USE ENCLOSURE 4.3 ***

2. S.C. State, Columbia
P: [REDACTED] 7:30 a.m. - 5:00 p.m. Weekdays
A: [REDACTED] After hours, Weekends & Holidays
*** USE ENCLOSURE 4.3 ***

3. Mecklenburg County
P: Selective Signal - [REDACTED]
A: [REDACTED]
Back-up: Emergency Radio, Code: [REDACTED]
*** USE ENCLOSURE 4.3 ***

4. York County
P: Selective Signal - [REDACTED]
A: [REDACTED]
Back-up: Emergency Radio, Code: [REDACTED]
*** USE ENCLOSURE 4.3 ***

5. Gaston County
P: Selective Signal - [REDACTED]
A: [REDACTED]
Back-up: Emergency Radio, Code: [REDACTED]
*** USE ENCLOSURE 4.3 ***

4.1.4 NRC Operations Center, Bethesda Md. (RP/0/B/5000/13)

P: EINS phone (red phone)
A: [REDACTED]

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
TO NUCLEAR PRODUCTION DUTY ENGINEER
EMERGENCY MESSAGE FORMAT

1. This is _____ at Catawba Nuclear Station.
(Name and Title)

2. This _____ is _____ is not a drill. An _____ Unusual Event
_____ X Alert
_____ Site Area Emergency
_____ General Emergency

was declared by the Emergency Coordinator at _____ on Unit # _____.
(Time)

3. Initiating Condition: (Give as close to the emergency plan description as possible together with station parameters used to determine emergency status.)

4. Corrective measures being taken: _____

5. There _____ have _____ have not not been any injuries to plant personnel.

6. Release of radioactivity: _____ is taking place
_____ is not taking place

7. NRC _____ Yes _____ No; State _____ Yes _____ No;
Counties _____ Yes _____ No; have been notified.

8. The Crisis Management Team _____ should _____ should not be activated.
Corporate Communications and Company Management should be notified.

9. I can be reached at _____ for follow-up information.
(Telephone Number)

10. Additional Comments: _____

Name of Person Contacted _____ Date _____ Time _____

EXAMPLE

WARNING MESSAGE: NUCLEAR FACILITY TO STATE/LOCAL GOVERNMENT

Instructions:

A. For Sender:

1. Complete Part I for the Initial Warning Message.
2. Complete Parts I & II for followup messages.

B. For Receiver:

1. Record the date, time and your name in the area below.
2. Authenticate this message by verifying the code word or by calling back to the facility. (See Part I.5)

Time: _____ Date: _____
Message Received By: _____

PART I

1. This is: Catawba Nuclear Station
2. My name is: John Doe, Shift Supervisor
3. This message (number 1):
 X (a) Reports a real emergency.
 (b) Is an exercise message.
4. My telephone number/extension is:
5. Message authentication: USE MESSAGE AUTHENTICATION LIST
(Verify code word or call back to facility)
6. The class of the emergency is: (a) Notification of Unusual Event
 X (b) Alert
 (c) Site Emergency
 (d) General Emergency
7. This classification of emergency was declared at: (a.m./p.m.) on
 (date).
8. The initiating event causing the emergency classification is: Fire
potentially affecting safety system
9. The emergency condition: X (a) Does not involve the release of
radioactive materials from the plant.
 (b) Involves the potential for a release,
but no release is occurring.
 (c) Involves a release of radioactive
material.

10. We recommend the following protective action:

- X (a) No protective action is recommended at this time.
- (b) People living in zones _____
remain indoors with the 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:

- X (a) A followup message
- (b) No further communications

12. I repeat, this message:

APPROVED FOR RELEASE

- X (a) Reports an actual emergency _____
(Emerg. Coord. Time.)
- (b) Is an exercise message

13. RELAY THIS INFORMATION TO THE PERSONS INDICATED ON YOUR ALERT
PROCEDURE FOR AN INCIDENT AT A NUCLEAR FACILITY.

END OF INITIAL WARNING MESSAGE

PART II

1. The type of actual or projected release is: N/A

- (a) Airborne
- (b) Waterborne
- (c) Surface spill
- (d) Other

2. The source and description of the release is: N/A

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

 N/A (b) The estimated duration of the release is _____ hours.

4. Dose projection base data:

Radiological release: N/A curies, or _____ curies/sec.
 Windspeed: 5 mph
 Wind direction: From 180°
 Stability class: D (A, B, C, D, E, F, or G)
 Release height: N/A Ft.
 Dose conversion factor: N/A R/hr/Ci/m³ (whole body)
 N/A R/hr/Ci/m³ (Child Thyroid)
 Precipitation: 0
 Temperature at the site: 72°F

5. Dose projections: N/A

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): N/A

7. Emergency actions underway at the facility include: Extinguished the fire

8. Onsite support needed from offsite organizations: None

9. Plant status:

- (a) Reactor is: not tripped/tripped
- (b) Plant is at: 100% power/hot shutdown/cold shutdown/cooling down
- (c) Prognosis is: stable/improving/degrading/unknown

(date)	(time)	(warning point)

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: RP/O/A/5000/04
Change(s) 3 to
4 Incorporated

(2) STATION: CATAWBA

(3) PROCEDURE TITLE: SITE AREA EMERGENCY

(4) PREPARED BY: Mike Bolch DATE: 2-15-85

(5) REVIEWED BY: Peter LeRoy DATE: 2-15-85

Cross-Disciplinary Review By: J.R. Ferguson 2/18/85 N/R:

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: J.R. Ferguson Date: 2/18/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
SITE AREA EMERGENCY

1.0 SYMPTOMS

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

2.0 IMMEDIATE ACTIONS

- 2.1 Make initial notifications to individuals and organizations.

- 2.1.1 Complete Enclosure 4.2 and Part I of Warning Message Form (see Example Enclosure 4.3). Record receiver's name and time (initial contact).

NOTE: Emergency Coordinator shall initial forms when message is approved for transmission. ;

NOTE: Warning Message forms are kept in a notebook in the Control Room and TSC, ensure that all used forms are returned to the back of the notebook.

- 2.1.2 Notifications shall be as the order of Enclosure 4.1 indicates. See RP/0/B/5000/13 for NRC Notification.

NOTE: The State and County notification must be made within 15 minutes of declaration of the emergency.

- 2.1.3 Advise station personnel to activate TSC and OSC.

- 2.1.4 Advise the Nuclear Production Duty Engineer to activate the CMC.

2.2 Protective Action Offsite

- 2.2.1 Recommend to Offsite Agencies that the Alerting Sirens be sounded and that the EBS be activated to inform the public of a potential for later protective actions.

2.3 Protective Action Onsite

- 2.3.1 Conduct a Site Assembly, see RP/0/A/5000/10.

3.0 SUBSEQUENT ACTIONS

3.1 Accident Assessment:

- 3.1.1 Dispatch field monitoring teams with associated communications equipment, see HP/0/B/1009/04.

3.2 Follow up Notifications.

- 3.2.1 Give follow-up message to offsite agencies listed on 4.1.3 of Enclosure 4.1, use the following schedule:

- Every half hour until the emergency is closed out.

or

- If there is any significant change to the situation.

or

- As agreed upon with the individual agencies.

- 3.2.2 Use Parts I & II of Warning Message Form as applicable. Mark all spaces "N/A" when information is "Not Applicable" and mark "Later" when information is not currently available.

3.3 Follow-up Recommend Protective Action Offsite

NOTE

Protective Action Recommendations are obtained from: OAC Program "Nuclear-23" or RP/0/A/5000/11, if the OAC is not available, for Operations personnel.

- 3.3.1 The Emergency Coordinator shall make Protective Action Recommendations to the affected county warning points and to both SC and NC state warning points (Emergency Operations Center if established) or the designated state department as per the state's Radiological Emergency Response Plan. See Enclosure 4.4 for aid in protective action decision making.

NOTE

This authority shall not be delegated to other elements of the emergency organization.

- 3.3.2 If actual release of radioactive material will result in a projected dose to the population of:

<u>Whole Body</u>	<u>Thyroid</u>	<u>Recommendation</u>
<1 Rem	<5 Rem	No Protective Action is Required.
1 to <5 Rem	5 to <25 Rem	Recommend seeking shelter and wait for further instruction. Consider evacuation particularly for children & pregnant women. Control access to affected areas.
> 5 Rem	> 25 Rem	Recommend mandatory evacuation of population in the affected areas. Control access to affected areas.

NOTE

Monitor environmental radiation levels to verify and adjust recommendations as necessary.

- 3.4 Follow-up Protective Actions On-site. :
- 3.4.1 Consider evacuation of non-essential station personnel, see RP/0/A/5000/10.
- 3.5 Augment shift resources to assess and respond to the emergency situation as needed.
- 3.6 Assess the emergency condition, then remain in a Site Area Emergency, escalate to a more severe class, reduce the emergency class, or terminate the emergency.
- 3.7 The Recovery Manager at the Crisis Management Center shall 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 Telephone Notification List
- 4.2 Emergency Message Format
- 4.3 Example Warning Message: Nuclear Facility to State/Local Government
- 4.4 Protective Action Recommendation Flow Chart
- 4.5 10 Mile Emergency Planning Zone (EPZ) Map and Wind Direction Determination Worksheet.

TELEPHONE
NOTIFICATION LIST

4.1.1	<u>CNS Emergency Personnel</u>	Initial
1.	Operations Duty Engineer - Plant Page P & T Pager [REDACTED] A: See Current Operations Work List for Home Phone Number.	_____
2.	Station Manager - J. W. Hampton Office [REDACTED] Home - [REDACTED] 1st Alternate - C. W. Graves Office [REDACTED] Home [REDACTED] 2nd Alternate - J. W. Cox Office [REDACTED] Home [REDACTED] 3rd Alternate - G. T. Smith Office [REDACTED] Home [REDACTED] 4th Alternate - B. F. Caldwell Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____ _____ _____
3.	Compliance Engineer - C. L. Hartzell Office [REDACTED] Home [REDACTED] 1st Alternate - M. E. Bolch Office [REDACTED] Home [REDACTED] 2nd Alternate - P. G. LeRoy Office [REDACTED] Home [REDACTED]	_____ _____ _____ _____
4.1.2	<u>Nuclear Production Duty Engineer</u> P & T Page [REDACTED] *** USE ENCLOSURE 4.2 ***	_____

4.1.3 State & County Warning Points (Within 15 minutes)

1. N.C. State, Raleigh

*** USE ENCLOSURE 4.3 ***

2. S.C. State, Columbia

P:

7:30 a.m. - 5:00 p.m. Weekdays

A:

Afterhours, Week-ends & Holidays

*** USE ENCLOSURE 4.3 ***

3. Mecklenburg County

P:

A:

Back-up: Emergency Radio, Code:

*** USE ENCLOSURE 4.3 ***

4. York County

P: Selective Signal

A:

Back-up: Emergency Radio, Code:

*** USE ENCLOSURE 4.3 ***

5. Gaston County

P: Selective Signal

A:

Back-up: Emergency Radio, Code:

*** USE ENCLOSURE 4.3 ***

4.1.4 NRC Operations Center, Bethesda Md. (RP/0/B/5000/13)

P: ENS phone (red phone)

A:

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
TO NUCLEAR PRODUCTION DUTY ENGINEER
EMERGENCY MESSAGE FORMAT

1. This is _____ at Catawba Nuclear Station.
(Name and Title)
 2. This _____ is _____ is not a drill. An _____ Unusual Event
_____ Alert
_____ X _____ Site Area Emergency
_____ General Emergency
was declared by the Emergency Coordinator at _____ on Unit # _____.
(Time)
 3. Initiating Condition: (Give as close to the emergency plan description as possible together with station parameters used to determine emergency status.)

 4. Corrective measures being taken: _____

 5. There _____ have _____ have not not been any injuries to plant personnel.
 6. Release of radioactivity: _____ is taking place
_____ is not taking place
 7. NRC _____ Yes _____ No; State _____ Yes _____ No;
Counties _____ Yes _____ No; have been notified.
 8. The Crisis Management Team _____ X _____ should _____ should not be activated.
Corporate Communications and Company Management should be notified.
 9. I can be reached at _____ for follow-up information.
(Telephone Number)
 10. Additional Comments: _____

- Name of Person Contacted _____ Date _____ Time _____

EXAMPLE

WARNING MESSAGE: NUCLEAR FACILITY TO STATE/LOCAL GOVERNMENT

Instructions:

A. For Sender:

1. Complete Part I for the Initial Warning Message.
2. Complete Parts I & II for followup messages.

B. For Receiver:

1. Record the date, time and your name in the area below.
2. Authenticate this message by verifying the code word or by calling back to the facility. (See Part I.5)

Time: _____ Date: _____

Message Received By: _____

PART I

1. This is: Catawba Nuclear Station

2. My name is: John Doe, Shift Supervisor

3. This message (number 1):

- X (a) Reports a real emergency.
_____ (b) Is an exercise message.

4. My telephone number/extension is:

5. Message authentication: USE MESSAGE AUTHENTICATION LIST
(Verify code word or call back to facility)

6. The class of the emergency is: _____ (a) Notification of Unusual Event
_____ (b) Alert
X (c) Site Emergency
_____ (d) General Emergency

7. This classification of emergency was declared at: _____ (a.m./p.m.) on
_____ (date).

8. The initiating event causing the emergency classification is: Transient
requiring operation of shutdown system with failure to trip.

9. The emergency condition: X (a) Does not involve the release of
radioactive materials from the plant.
_____ (b) Involves the potential for a release,
but no release is occurring.
_____ (c) Involves a release of radioactive
material.

10. We recommend the following protective action:

- _____ (a) No protective action is recommended at this time.
- _____ (b) People living in zones _____ remain indoors with the 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.
- X (f) Other recommendations: Activate offsite notification system & EBS to inform public

11. There will be:

- X (a) A follow-up message
- _____ (b) No further communications

Approved for Release :

12. I repeat, this message:

 Emerg. Coord. Time

- _____ (a) Reports an actual emergency
- _____ (b) Is an exercise message

13. RELAY THIS INFORMATION TO THE PERSONS INDICATED ON YOUR ALERT PROCEDURE FOR AN INCIDENT AT A NUCLEAR FACILITY.

END OF INITIAL WARNING MESSAGE

PART II

1. The type of actual or projected release is: N/A

- _____ (a) Airborne
- _____ (b) Waterborne
- _____ (c) Surface spill
- _____ (d) Other

2. The source and description of the release is: N/A

3. N/A (a) Release began/will begin at a.m./p.m.; time since reactor trip is 1/2 hours.

 N/A (b) The estimated duration of the release is hours.

4. Dose projection base data:

Radiological release: N/A curies, or curies/sec.
 Windspeed: 5 mph
 Wind direction: From 180°
 Stability class: D (A, B, C, D, E, F, or G)
 Release height: N/A Ft.
 Dose conversion factor: N/A R/hr/Ci/m³ (whole body)
 N/A R/hr/Ci/m³ (Child Thyroid)
 Precipitation: 0
 Temperature at the site: 72°F

5. Dose projections: N/A

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): Later

7. Emergency actions underway at the facility include: Replacing breaker

8. Onsite support needed from offsite organizations: None

9. Plant status:

- (a) Reactor is: not tripped/tripped
- (b) Plant is at: 0 % power/hot shutdown/cold shutdown/cooling down
- (c) Prognosis is: stable/improving/degrading/unknown

10. I repeat, this message:

Approved for Release

 X (a) Reports an actual emergency.

_____ (b) Is an exercise message.

Emerg. Coord.	Time
---------------	------

11. Do you have any questions?

END OF FOLLOW-UP MESSAGE

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

Record the name, title, date, time, and persons notified per alert procedure. (Receivers)

1. _____
(name) (title)

(date)	(time)	(warning point)

2. _____
(name) (title)

(date) (time) (warning point)

3. _____
(name) (title)

(date) (time) (warning point)

4. _____
 (name) _____ (title) _____

(date)	(time)	(warning point)
--------	--------	-----------------

5. _____
(name) (title)

(date)	(time)	(warning point)
--------	--------	-----------------

6. _____
 (name) _____ (title)

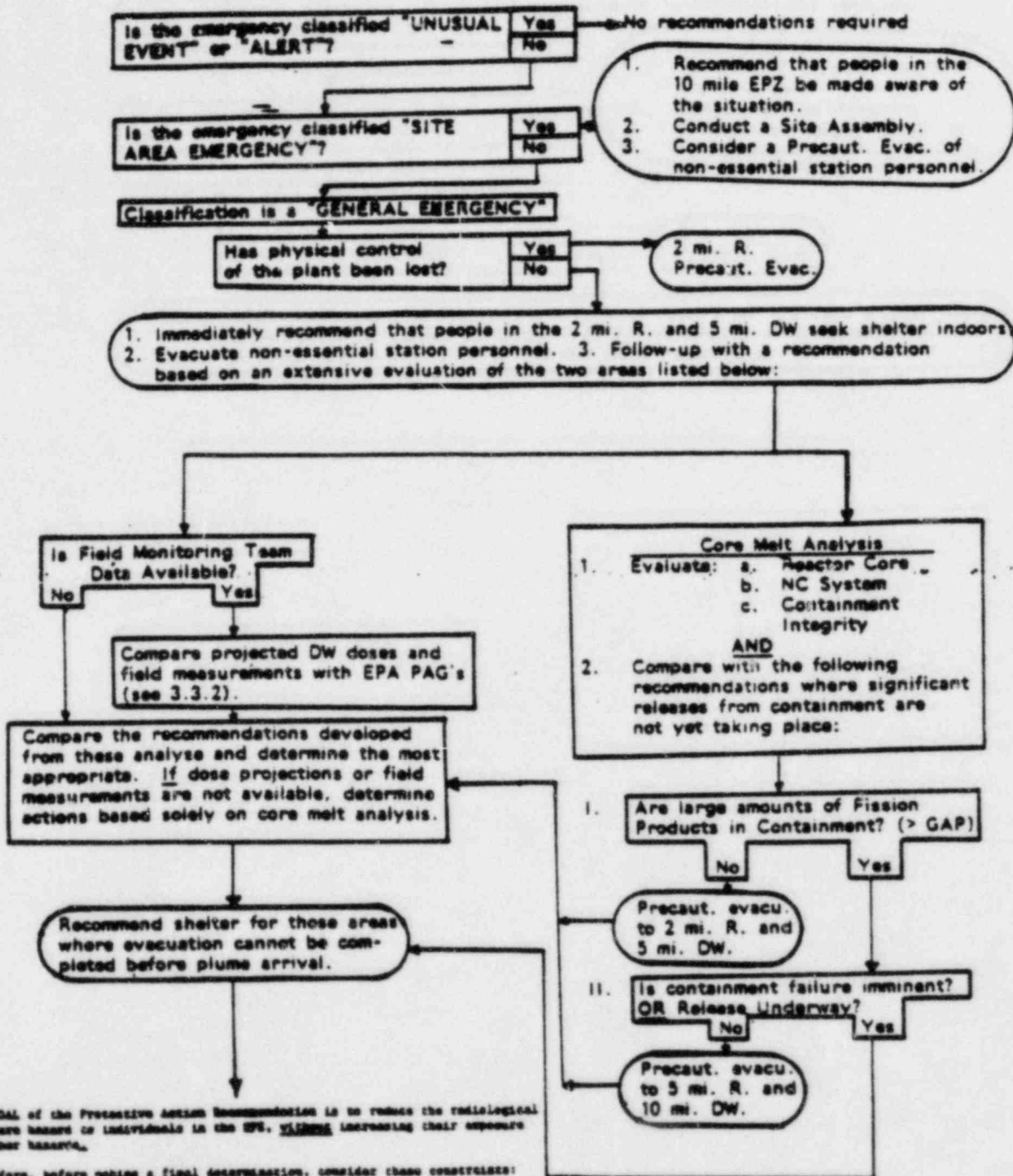
(date)	(time)	(warning point)
--------	--------	-----------------

7. _____
(name) (title)

(date) (time) (warning point)

ENCLOSURE 4.4
PROTECTIVE ACTION RECOMMENDATION
FLOW CHART

RP/0/A/5000/04
SITE AREA EMERGENCY
Page 1 of 1



The GOAL of the Protective Action Recommendation is to reduce the radiological exposure hazard to individuals in the EPZ, without increasing their exposure to other hazards.

Therefore, before making a final determination, consider these constraints:

1. Do not overassure the public if evacuation cannot be completed before estimated plume arrival. (Compare evacuation time estimate versus estimated plume arrival time.)
2. Consider the consequences of evacuation of areas nearest the plant.
3. Do bridge and road conditions present an impediment to evacuation?
4. Will weather conditions inhibit evacuation?
5. Can State/County agencies support the recommendation?
6. Is this a "Puff" or continuous release?
7. For any evacuation, recommend sheltering for the population in the plume exposure EPZ not evacuated.
8. Promptly release the population affected by any ground contamination following plume passage.

Abbreviations
DW - Downwind
R - Radius

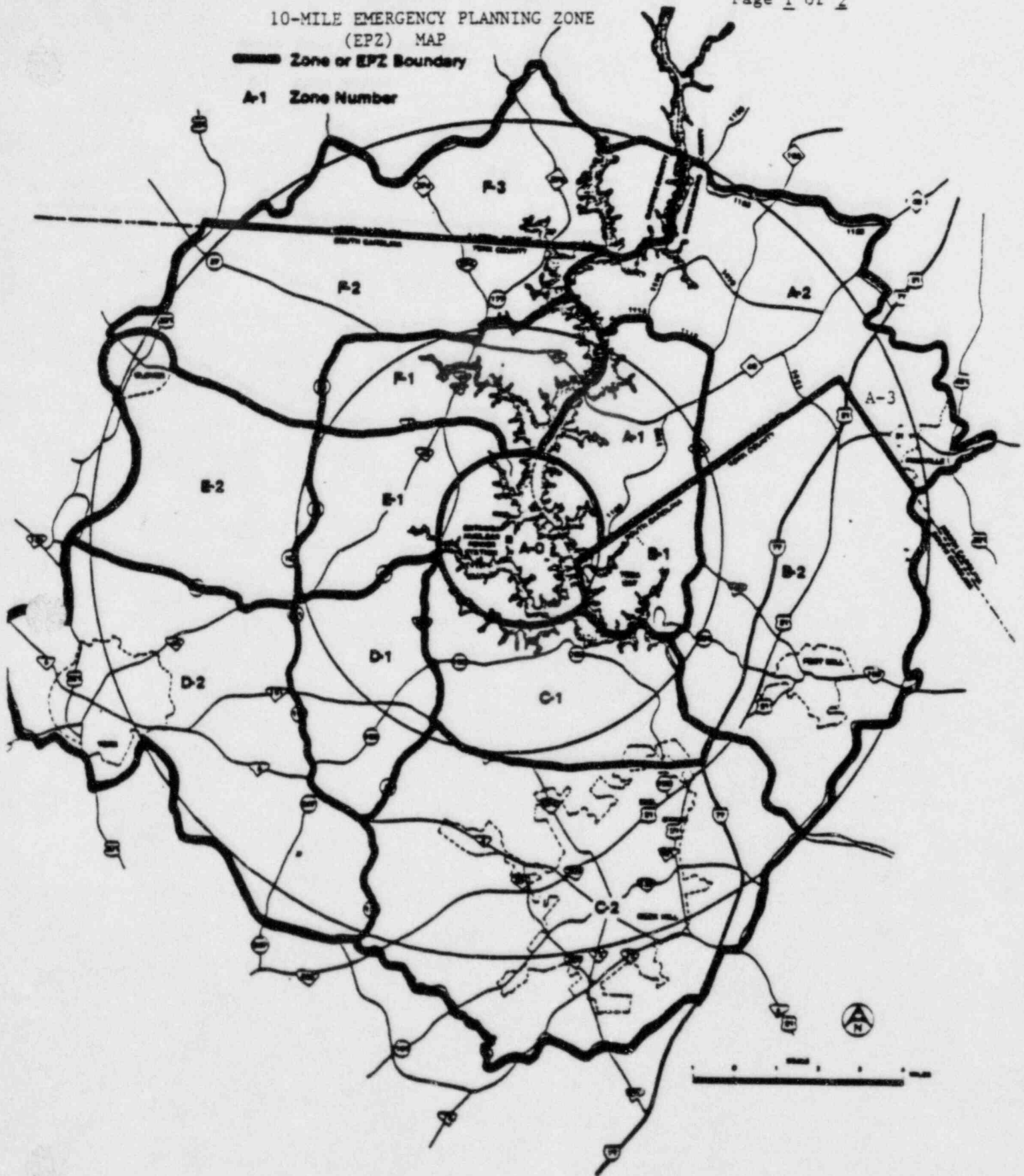
CATAWBA NUCLEAR STATION

10-MILE EMERGENCY PLANNING ZONE
(EPZ) MAP

Zone or EPZ Boundary

A-1 Zone Number

RF/O/A/3000/0-
Enclosure 4.5
Page 1 of 2



DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
RP/O/A/5000/04
ENCLOSURE 4.5

WIND DIRECTION DETERMINATION WORK SHEET

Based on wind direction (WD), determine the affected zones from the tables below. Circle the wind direction and affected zones.

NOTE: Upper tower wind direction is preferred. If not available, use lower WD, then use WD from National Weather Service.

- A. IF WIND SPEED IS < 5 MPH, THE AFFECTED ZONES ARE A-0, A-1, B-1, C-1, D-1, E-1 and F-1.
- B. IF WIND SPEED IS > 5 MPH, SELECT THE AFFECTED ZONES FROM THE TABLES BELOW AS APPLICABLE.

Table 2.1	
0-5 Mile Radius Wind Direction	Affected Zones
0.1° - 360°	A-0
PLUS	
0.1° - 22°	C-1, D-1
22° - 73°	C-1, D-1, E-1
73° - 108°	C-1, D-1, E-1, F-1
108° - 120°	D-1, E-1, F-1
120° - 159°	E-1, F-1
159° - 207°	E-1, F-1, A-1
207° - 247°	F-1, A-1, B-1
247° - 265°	A-1, B-1
265° - 298°	A-1, B-1, C-1
298° - 338°	B-1, C-1
338° - 360°	B-1, C-1, D-1

Table 2.2	
5-10 Mile Radius Wind Direction	Affected Zones
0.1 - 27°	C-2, D-2
27° - 69°	C-2, D-2, E-2
69° - 95°	D-2, E-2, F-2
95° - 132°	D-2, E-2, F-2, F-3
132° - 144°	E-2, F-2, F-3
144° - 160°	E-2, F-2, F-3, A-2
160° - 201°	F-2, F-3, A-2
201° - 229°	F-2, F-3, A-2, B-2
229° - 249°	F-3, A-2, B-2
249° - 259°	A-2, A-3, B-2
259° - 290°	A-2, B-2, C-2, A-3
290° - 304°	A-3, B-2, C-2
304° - 333°	B-2, C-2
333° - 360°	B-2, C-2, D-2

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: RP/O/A/5000/05
Change(s) 3 to
4 Incorporated

- (2) STATION: CATAWBA
- (3) PROCEDURE TITLE: GENERAL EMERGENCY
- (4) PREPARED BY: Mike Bolech DATE: 2-15-85
- (5) REVIEWED BY: Peter LeRoy DATE: 2-15-85
Cross-Disciplinary Review By: J. R. Fargus 2/18/85 N/R: _____
- (6) TEMPORARY APPROVAL (IF NECESSARY):
By: _____ (SRO) Date: _____
By: _____ Date: _____
- (7) APPROVED BY: Jw. by Date: 2/18/85
- (8) MISCELLANEOUS:
Reviewed/Approved By: _____ Date: _____
Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
GENERAL EMERGENCY

1.0 SYMPTOMS

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

2.0 IMMEDIATE ACTIONS

- 2.1 Make initial notifications to individuals and organizations.

- 2.1.1 Complete Enclosure 4.2 and Part I of Warning Message Form (see example Enclosure 4.3). Record receiver's name and time (initial contact).

NOTE: Emergency Coordinator shall initial forms when message is approved for transmission.

NOTE: Warning Message forms are kept in a notebook in the Control Room and TSC, ensure that all used forms; are returned to the back of the notebook.

- 2.1.2 Notifications shall be as the order of Enclosure 4.1 indicates. See RP/0/B/5000/13 for NRC Notification.

NOTE: The State and County notification must be made within 15 minutes of declaration of the emergency.

- 2.1.3 Advise station personnel to activate TSC and OSC.
- 2.1.4 Advise the Nuclear Production Duty Engineer to activate the CMC.

- 2.2 Protective Actions Offsite

- 2.2.1 Recommend to Offsite Agencies that all residents of the 2 mile radius zone (A-O) and any zone 5 miles downwind of the plant seek immediate shelter and await further instructions.

- 2.3 Protective Action Onsite

- 2.3.1 Conduct a Site Assembly, see RP/0/A/5000/10.
- 2.3.2 Evacuate non-essential personnel to the Evacuation Relocation Centers, see RP/0/A/5000/10.

3.0 SUBSEQUENT ACTIONS

3.1 Accident Assessment:

- 3.1.1 Dispatch field monitoring teams with associated communications equipment, see HP/0/B/1009/04.

3.2 Follow up Notifications.

- 3.2.1 Give follow-up messages to offsite agencies listed on 4.1.3 of Enclosure 4.1, use the following schedule:

- Every half hour until the emergency is closed out.

or

- If there is any significant change to the situation.

or

- As agreed upon with the individual agencies.

- 3.2.2 Use Parts I & II of Warning Message Form as applicable. . Mark all spaces "N/A" when information is "Not Applicable" and mark "Later" when information is not currently available.

3.3 Follow-up Recommend Protective Action Offsite

NOTE

Protective Action Recommendation are obtained from: OAC Program "Nuclear-23" or RP/0/A/5000/11, if the OAC is not operational, for Operations personnel.

- 3.3.1 The Emergency Coordinator shall make Protective Action Recommendations to the affected county warning points and to both SC and NC state warning points (Emergency Operations Center if established) or the designated state department as per the state's Radiological Emergency Response Plan. See Enclosure 4.4 for aid in protective action decision making.

NOTE

This authority shall not be delegated to other elements of the emergency organization.

- 3.3.2 If actual release of radioactive material will result in a projected dose to the population of:

<u>Whole Body</u>	<u>Thyroid</u>	<u>Recommendation</u>
<1 Rem	<5 Rem	No Protective Action is Required.
1 to <5 Rem	5 to <25 Rem	Recommend seeking shelter and wait for further instruction. Consider evacuation particularly for children & pregnant women. Control access to affected areas.
>5 Rem	>25 Rem	Recommend mandatory evacuation of population in the affected areas. Control access to affected areas.

NOTE

Monitor environmental radiation levels to verify and adjust recommendations as necessary.

- 3.4 Augment on shift resources to assess and respond to the emergency situation as needed.
- 3.5 Assess the emergency condition, then remain in an General Emergency, reduce the emergency class or close out the emergency.
- 3.6 The Recovery Manager at the Crisis Management Center shall 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 Telephone Notification List
- 4.2 Emergency Message Format
- 4.3 Example Warning Message: Nuclear Facility to State/Local Government
- 4.4 Protective Action Recommendation Flow Chart
- 4.5 10 Mile Emergency Planning Zone (EPZ) Map and Wind Direction Determination Worksheet

**TELEPHONE
NOTIFICATION LIST**

4.1.1 CNS Emergency Personnel

Initial

1. Operations Duty Engineer - Plant Page _____
P & T Pager _____
A: See Current Operations Work List for Home Phone Number.
2. Station Manager - J. W. Hampton _____
Office _____
Home - _____
- 1st Alternate - C. W. Graves _____
Office _____
Home _____
- 2nd Alternate - J. W. Cox _____
Office _____
Home _____
- 3rd Alternate - G. T. Smith _____
Office _____
Home _____
- 4th Alternate - B. F. Caldwell _____
Office _____
Home _____
3. Compliance Engineer - C. L. Hartzell _____
Office _____
Home _____
- 1st Alternate - M. E. Bolch _____
Office _____
Home _____
- 2nd Alternate - P. G. LeRoy _____
Office _____
Home _____

4.1.2 Nuclear Production Duty Engineer

P & T Page

USE ENCLOSURE 4.2

4.1.3 State & County Warning Points (Within 15 minutes)

1. N.C. State, Raleigh

*** USE ENCLOSURE 4.3 ***

2. S.C. State, Columbia

P: 7:30 a.m. - 5:00 p.m. Weekdays
A: After hours, Weekends & Holidays

*** USE ENCLOSURE 4.3 ***

3. Mecklenburg County

P: Selective Signal

A:

Back-up: Emergency Radio, Code

*** USE ENCLOSURE 4.3 ***

4. York County

P: Selective Signal

A:

Back-up: Emergency Radio, Code

*** USE ENCLOSURE 4.3 ***

5. Gaston County

P: Selective Signal

A:

Back-up: Emergency Radio, Code

*** USE ENCLOSURE 4.3 ***

4.1.4 NRC Operations Center, Bethesda Md. (RP/0/B/5000/13)

P: ENS phone (red phone)

A:

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
TO NUCLEAR PRODUCTION DUTY ENGINEER
EMERGENCY MESSAGE FORMAT

1. This is _____ at Catawba Nuclear Station.
(Name and Title)
 2. This _____ is _____ is not a drill. An _____ Unusual Event
_____ Alert
_____ Site Area Emergency
_____ X General Emergency
was declared by the Emergency Coordinator at _____ on Unit # _____.
(Time)
 3. Initiating Condition: (Give as close to the emergency plan description as possible together with station parameters used to determine emergency status.)

 4. Corrective measures being taken: _____

 5. There _____ have _____ have not not been any injuries to plant personnel.
 6. Release of radioactivity: _____ is taking place
_____ is not taking place
 7. NRC _____ Yes _____ No; State _____ Yes _____ No;
Counties _____ Yes _____ No; have been notified.
 8. The Crisis Management Team _____ should _____ should not be activated.
Corporate Communications and Company Management should be notified.
 9. I can be reached at _____ for follow-up information.
(Telephone Number)
 10. Additional Comments: _____

- Name of Person Contacted _____ Date _____ Time _____

EXAMPLE

WARNING MESSAGE: NUCLEAR FACILITY TO STATE/LOCAL GOVERNMENT

Instructions:

A. For Sender:

1. Complete Part I for the Initial Warning Message.
2. Complete Parts I & II for followup messages.

B. For Receiver:

1. Record the date, time and your name in the area below.
2. Authenticate this message by verifying the code word or by calling back to the facility. (See Part 1.5)

Time: _____ Date: _____

Message Received By: _____

PART I

1. This is: Catawba Nuclear Station

2. My name is: John Doe, Shift Supervisor

3. This message (number 1):

<u>X</u>	(a)	Reports a real emergency.
	(b)	Is an exercise message.

4. My telephone number/extension is:

5. Message authentication: USE MESSAGE AUTHENTICATION LIST

(Verify code word or call back to facility)

6. The class of the emergency is: _____ (a) Notification of Unusual Event
 _____ (b) Alert
 _____ (c) Site Emergency
 X _____ (d) General Emergency

7. This classification of emergency was declared at: _____ (a.m./p.m.) on _____ (date).

8. The initiating event causing the emergency classification is: Large loss of coolant accident with failure of Emergency Core Cooling System

9. The emergency condition: X (a) Does not involve the release of radioactive materials from the plant.
_____ (b) Involves the potential for a release, but no release is occurring.
_____ (c) Involves a release of radioactive material.

10. We recommend the following protective action:

- ☐ (a) No protective action is recommended at this time.
- ☒ (b) People living in zone, A-O + X (5 mi. DW)
remain indoors with the 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:

APPROVED FOR RELEASE

- ☒ (a) Reports an actual emergency _____
(Emerg. Coord. Time.)
- ☐ (b) Is an exercise message

13. RELAY THIS INFORMATION TO THE PERSONS INDICATED ON YOUR ALERT
PROCEDURE FOR AN INCIDENT AT A NUCLEAR FACILITY.

END OF INITIAL WARNING MESSAGE

PART II

1. The type of actual or projected release is: N/A

- ☐ (a) Airborne
- ☐ (b) Waterborne
- ☐ (c) Surface spill
- ☐ (d) Other

2. The source and description of the release is: N/A

3. N/A (a) Release began/will begin at _____ a.m./p.m.; time since
reactor trip is 1/2 hours.

N/A (b) The estimated duration of the release is _____ hours.

4. Dose projection base data:

Radiological release: N/A curies, or curies/sec.
 Windspeed: 5 mph
 Wind direction: From 180°
 Stability class: D (A, B, C, D, E, F, or G)
 Release height: N/A Ft.
 Dose conversion factor: N/A R/hr/Ci/m³ (whole body)
 N/A R/hr/Ci/m³ (Child Thyroid)
 Precipitation: 0
 Temperature at the site: 72°F

5. Dose projections: N/A

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): Later

7. Emergency actions underway at the facility include: Cooling down
primary system to depressurize

8. Onsite support needed from offsite organizations: None

9. Plant status:

- (a) Reactor is: not tripped/tripped
 (b) Plant is at: 0 % power/hot shutdown/cold shutdown/cooling down
 (c) Prognosis is: stable/improving/degrading/unknown

10. I repeat, this message:

 x (a) Reports an actual emergency.

_____ (b) Is an exercise message.

APPROVED FOR RELEASE

11. Do you have any questions?

(Emerg. Coord. Time)

END OF FOLLOW-UP MESSAGE

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

Record the name, title, date, time, and persons notified per alert procedure. (Receivers)

1. _____
(name) (title)

[illegible]

2. _____
(name) (title)

(date)	(time)	(warning point)

3. _____
 (name) (title)

(date) (time) (warning point)

4. _____
(name) (title)

[illegible]

5. _____
(name) (title)

(date)	(time)	(warning point)
--------	--------	-----------------

6. _____
(name) (title)

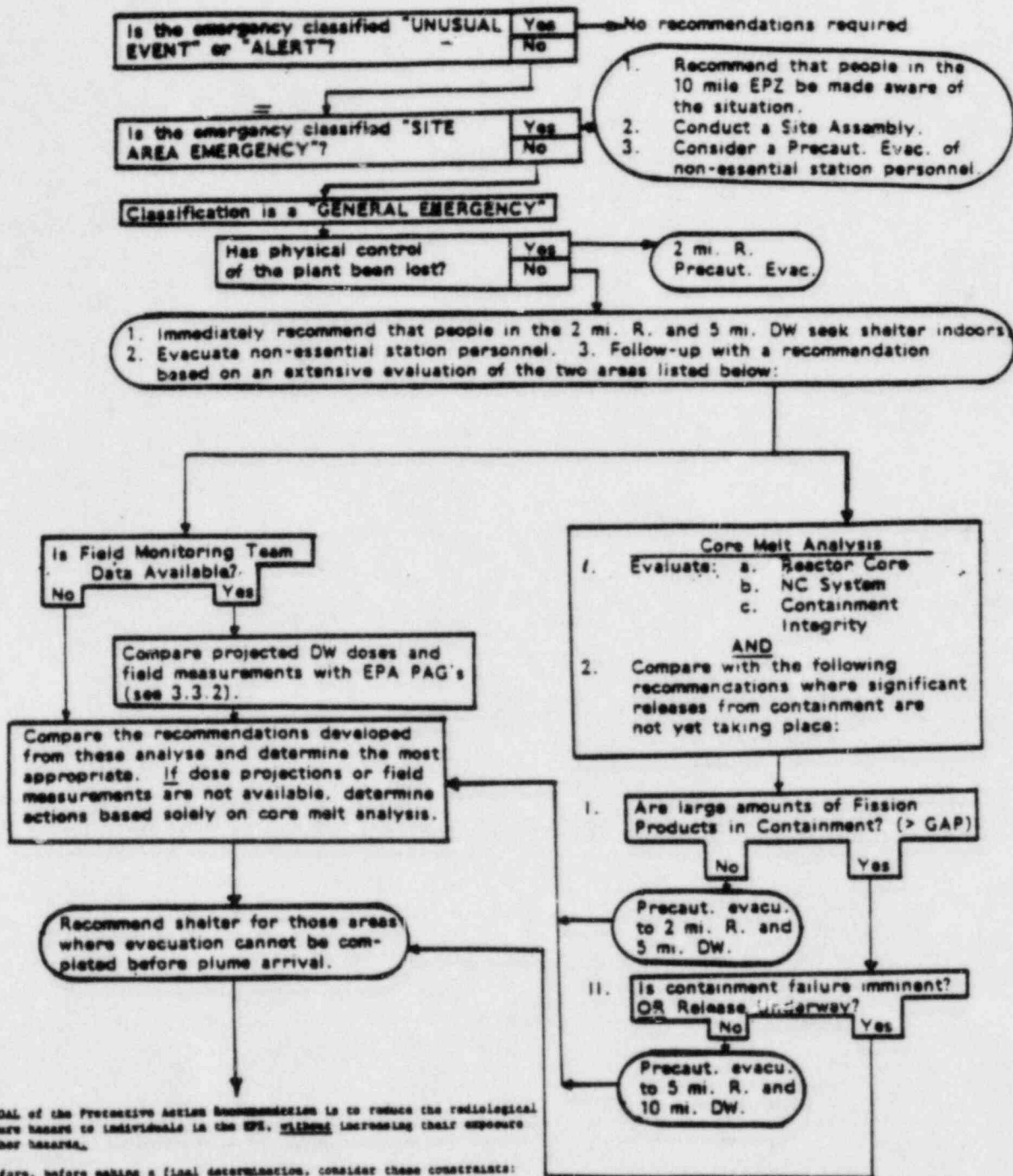
[illegible]

7. _____
(name) (title)

(date) (time) (warning point)

ENCLOSURE 4.4
PROTECTIVE ACTION RECOMMENDATION
FLOW CHART

RP/0/A/5000/05
GENERAL EMERGENCY
Page 1 of 1



The GOAL of the Protective Action Recommendation is to reduce the radiological exposure hazard to individuals in the EPI, without increasing their exposure to other hazards.

Therefore, before making a final determination, consider these constraints:

1. Do not evacuate the public if evacuation cannot be completed before estimated plume arrival. (Compare evacuation time estimate versus estimated plume arrival time.)
2. Concentrate on evacuation of areas nearest the plant.
3. Do bridge and road conditions present an impediment to evacuation?
4. Will weather conditions inhibit evacuation?
5. Can State/County agencies support the recommendation?
6. Is this a "Puff" or continuous release?
7. For any evacuation, recommend sheltering for the population in the plume exposure EPI not evacuated.
8. Promptly release the population affected by any ground contamination following plume passage.

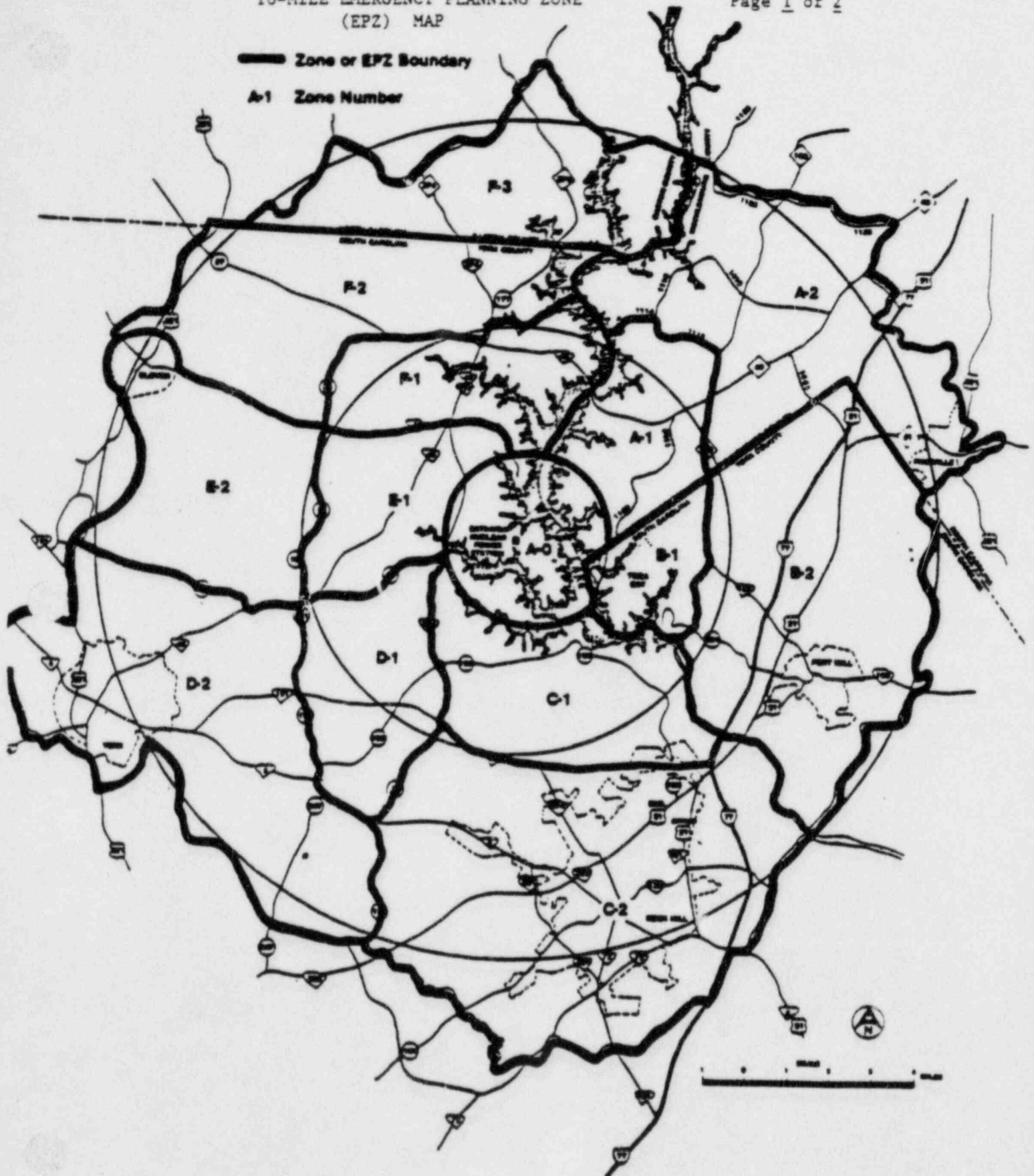
Abbreviations
DW - Downwind
R - Radius

CATAWBA NUCLEAR STATION
10-MILE EMERGENCY PLANNING ZONE
(EPZ) MAP

KP/U/A/3000/03
Enclosure 4.5
Page 1 of 2

Zone or EPZ Boundary

A-1 Zone Number



DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
RP/O/A/5000/05
ENCLOSURE 4.5

WIND DIRECTION DETERMINATION WORK SHEET

Based on wind direction (WD), determine the affected zones from the tables below. Circle the wind direction and affected zones.

NOTE: Upper tower wind direction is preferred. If not available, use lower WD, then use WD from National Weather Service.

- A. IF WIND SPEED IS < 5 MPH, THE AFFECTED ZONES ARE A-0, A-1, B-1, C-1, D-1, E-1 and F-1.
- B. IF WIND SPEED IS > 5 MPH, SELECT THE AFFECTED ZONES FROM THE TABLES BELOW AS APPLICABLE.

Table 2.1
0-5 Mile Radius
Wind Direction Affected
Zones

0.1° - 360°	→ A-0
PLUS	
0.1° - 22°	→ C-1, D-1
22° - 73°	→ C-1, D-1, E-1
73° - 108°	→ C-1, D-1, E-1, F-1
108° - 120°	→ D-1, E-1, F-1
120° - 159°	→ E-1, F-1
159° - 207°	→ E-1, F-1, A-1
207° - 247°	→ F-1, A-1, B-1
247° - 265°	→ A-1, B-1
265° - 298°	→ A-1, B-1, C-1
298° - 338°	→ B-1, C-1
338° - 360°	→ B-1, C-1, D-1

Table 2.2
5-10 Mile Radius
Wind Direction Affected
Zones

0.1 - 27°	→ C-2, D-2
27° - 69°	→ C-2, D-2, E-2
69° - 95°	→ D-2, E-2, F-2
95° - 132°	→ D-2, E-2, F-2, F-3
132° - 144°	→ E-2, F-2, F-3
144° - 160°	→ E-2, F-2, F-3, A-2
160° - 201°	→ F-2, F-3, A-2
201° - 229°	→ F-2, F-3, A-2, B-2
229° - 249°	→ F-3, A-2, B-2
249° - 259°	→ A-2, A-3, B-2
259° - 290°	→ A-2, B-2, C-2, A-3
290° - 304°	→ A-3, B-2, C-2
304° - 333°	→ B-2, C-2
333° - 360°	→ B-2, C-2, D-2

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: RP/O/B/5000/13
Change(s) 2 to
3 Incorporated

(2) STATION: CATAWBA

(3) PROCEDURE TITLE: NRC NOTIFICATION REQUIREMENTS

(4) PREPARED BY: Mike Bolch DATE: 2-4-85

(5) REVIEWED BY: C. J. Hartell DATE: 2-4-85

Cross-Disciplinary Review By: J. R. Deegan 2/4/85 N/R: 822

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: J. R. Deegan Date: 2/4/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____


DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
NRC NOTIFICATION REQUIREMENTS

1.0 SYMPTOMS

- 1.1 Plant conditions requiring NRC notification in accordance with:
10 CFR50.72, 10 CFR20.205, 10 CFR20.403, and 10 CFR73.71.
 - 1.1.1 Immediate, 1 Hour and 4 Hour Notifications.
 - 1.1.2 24 Hour Notifications for Operating License Condition - Deviations.
- 1.2 See Enclosure 4.1 for determination of appropriate notification requirement.

2.0 IMMEDIATE ACTIONS

- 2.1 Complete one of the following enclosures:
 - 2.1.1 Enclosure 4.2 "Checklist for Significant Event Notification"
 - or
 - 2.1.2 Enclosure 4.3 "Report of Serious Physical Security Events"

When reporting from Section 4.1.2.7 of Enclosure 4.1
- 2.2 Notify the NRC Operations Center by the following means:
 - 2.2.1 Pri. - Emergency Notification System Phone
 - or -
 - 2.2.2 Alt. 
- 2.3 Notify the NRC Region II Office at 404-221-4503 of any event listed in Section 4.1.1.5 of Enclosure 4.1.

NOTE: No Enclosure for reporting to Region II from Section 4.1.1.5 of Enclosure 4.1

3.0 SUBSEQUENT ACTIONS

- 3.1 Provide follow-up notification as described below:
 - 3.1.1 Emergency Classes
 - 3.1.1.1 Any further degradation in level of safety of the plant including those that require declaration of any Emergency Class, if such a declaration has not been previously made.

- 3.1.1.2 Any change in the Emergency Class
 - 3.1.1.3 Termination of the Emergency
 - 3.1.2 Results of ensuing evaluations or assessments of plant conditions
 - 3.1.3 Effectiveness of response or protective measures taken
 - 3.1.4 Information related to plant behavior that is not understood
 - 3.2 Maintain an "Open", continuous, communications channel with the NRC Operations Center, upon request by the NRC.
 - 3.3 Notify the following individual:
 - 3.3.1 Compliance Engineer

<u>Primary</u>		<u>Alternate</u>
C. L. Hartzell		Duty Compliance
Office: [REDACTED]	or	Engineer
Home: [REDACTED]		(See current Station
		Duty List)
 - 3.3.2 If neither the Compliance Engineer nor the Duty Compliance Engineer can be reached then call directly to the:
NRC Resident Inspector

<u>Primary</u>		<u>Alternate</u>
P. H. Skinner		P. K. VanDoorn
Office: [REDACTED]	or	Office: [REDACTED]
Home: [REDACTED]		Home: [REDACTED]
- 3.4 Upon completion of this procedure, attach a completed Procedure Process Record Form and forward to the Compliance Engineer for review prior to submission to Master File.

4.0 ENCLOSURES

- 4.1 Events Requiring NRC Notification
- 4.2 Checklist for Serious Event Notification
- 4.3 Report of Serious Physical Security Events

4.1.1 Events Requiring "IMMEDIATE NOTIFICATIONS":

Immediately after notification to states and counties and not later than one hour after the time the Emergency Class was declared.

4.1.1.1 The declaration of any of the Emergency Classes specified in the Catawba Emergency Plan

4.1.1.2 Any change from one Emergency Class to another

4.1.1.3 Termination of the Emergency

4.1.1.4 For any incident involving byproduct, source or special nuclear material which may have caused or threatens to cause the following:

4.1.1.4.1 Individual Exposure

≥ 25 Rem Whole Body

or

≥ 150 Rem Skin of Whole Body

or

≥ 375 Rem Extremities

4.1.1.4.2 Release of radioactive material in concentration which if averaged over a 24 hour period would exceed 5,000 times the applicable concentration of the limits specified in 10 CFR 20, Appendix B, Table II.

4.1.1.4.3 Loss of one working week or more of the operation of any unit.

4.1.1.4.4 Damage to property in excess of \$200,000.

4.1.1.5 Notification to NRC Regional Office, Region II, Atlanta, GA. (see Step 2.3). Receipt of a package of radioactive materials with:

4.1.1.5.1 ≥ 0.01 $\mu\text{Ci}/100\text{cm}^2$ loose radioactive material on the external surface

or

4.1.1.5.2 >200 MR/hr. on external surface

or

4.1.1.5.3 >10 MR/hr. at three (3) feet from the
external surface

4.1.2 Events Requiring "ONE HOUR REPORTS":

As soon as practical and within one hour of the
occurrence.

4.1.2.1 The initiation of any nuclear plant shutdown
required by Technical Specifications (i.e.
Safety Limit Violation). See notes:

NOTE: 1. The Initiation of a Shutdown is defined
as, "A reduction in Power required by an
action statement of Tech. Specs. or any
unplanned trip (automatic or manual) to
Mode 3."

2. Shutdown is defined (for reporting
requirements) as, "Mode 3 and below".

4.1.2.2 Any deviation from a plant License Condition or
Technical Specification authorized in
10CFR50.54(x).
(Licensee may take reasonable action that
departs from a license condition or a technical
specification in an emergency when this action is
immediately needed to protect the health and
safety of the public and no action consistent
with license conditions and technical
specifications that can provide adequate or
equivalent protection is immediately apparent.)

4.1.2.3 Any event or condition during operation that
results in the condition of the plant, including
the principle safety barriers, being seriously
degraded, or results in the plant being:

4.1.2.3.1 In an unanalyzed condition that
significantly compromises plant safety.

4.1.2.3.2 In a condition that is outside the
design basis of the plant.

4.1.2.3.3 In a condition not covered by the
plant's operating and emergency
procedures.

4.1.2.4 Any event that results or should have resulted
in Emergency Core Cooling System (ECCS)
discharge into the reactor coolant system as a
result of a valid signal.

- 4.1.2.5 Any event that results in a major loss of emergency assessment capability, offsite response capability, or communications capability (e.g., significant portion of control room indication, Emergency Notification System or Offsite Notification System).
- 4.1.2.6 Any natural phenomenon or other external condition or any event that poses an actual threat to the safety of the plant or significantly hampers site personnel in the performance of duties necessary for the safe operation of the plant, including fires, toxic gas releases or radioactive releases.
- 4.1.2.7 Safeguard events as determined by Security personnel and Station Management.
 - 4.1.2.7.1 A trace investigation of a lost or unaccounted for shipment pursuant to 10 CFR 73.27.
 - 4.1.2.7.2 An attempt (actual or suspected) to commit a theft or unlawful diversion of Special Nuclear Material.
 - 4.1.2.7.3 Any event which significantly threatens or lessens the effectiveness of the physical security system Uncompensated one (1) hour safeguards events
 - a. Confirmed Intrusion or Sabotage attempt (explicit threat).
 - b. Attempted entry of unauthorized Incendiary devices into Protected Area.
 - c. Bomb Threat/Extortion Threat (Explicit Threat, includes entry into vital area(s)).
 - d. Mass Demonstration, Picketing, Civil Disturbance (Explicit Threat, Event occurs inside the Protected Area).
 - e. Loss of both CAS/SAS (Major loss of physical security effectiveness).
 - f. Loss of Offsite Communications to LLEA (Local Law Enforcement Agency).
 - g. Loss or Degradation of Power Supply to Security Systems.

- h. Unavailability of minimum number of Security Force Members.
- i. Decreased effectiveness of the Physical Barriers (Vital or Protected Area) creating a major loss of physical security effectiveness.

4.1.3 Events Requiring "FOUR HOUR REPORTS"

As soon as practical and within four hours of the occurrence.

- 4.1.3.1 Any event found while the reactor(s) is/are shutdown, that had it been found while the reactor(s) was/were in operation would have resulted in the plant, including its principle safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety.
- 4.1.3.2 Any event or condition that results in manual or automatic activation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS). (However, activation of an ESF including the RPS, that results from and is part of the preplanned sequence during testing or reactor operation need not be reported).
- 4.1.3.3 Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to:
 - 4.1.3.3.1 Shutdown the reactor and maintain it in a safe shutdown condition.
 - 4.1.3.3.2 Remove residual heat.
 - 4.1.3.3.3 Control the release of radioactive material.
 - 4.1.3.3.4 Mitigate the consequences of an accident.

- 4.1.3.4 Any airborne radioactive release that exceeds 2 times the applicable concentrations of the limits specified in 10CFR20, Appendix B, Table II in unrestricted areas when averaged over a time period of one hour.
- 4.1.3.5 Any liquid effluent release that exceeds 2 times the limiting combined MPC (See 10CFR20, Appendix B, Note 1.) at the point of entry into the receiving water (unrestricted area) for all radionuclides except tritium and dissolved noble gases, when averaged over a time period of one hour. (Immediate Notifications made under this requirement also satisfy the requirements of 10CFR20.403, Paragraph (a)(2) and (b)(2)). (See 4.1.1.4.2).
- 4.1.3.6 Any event requiring the transport of a radioactively contaminated person to an offsite medical facility for treatment.
- 4.1.3.7 Any event or situation, related to the health and safety of the public or onsite personnel, or protection of the environment, for which a News Release is planned

or

Notification to Other Government Agencies has been or will be made. Such an event may include an onsite fatality or inadvertent release of radioactively contaminated materials.

- 4.1.4 Operating License Conditions Deviations Requiring "24 Hr. Notifications":

- 4.1.4.1 Refer to Operating License

4.1.4 Follow-up Notifications

4.1.4.1 During the course of the event, report:

4.1.4.1.1 Any further degradation in the level of safety of the plant or other worsening plant conditions, including those that require the declaration of any of the Emergency Classes, if such a declaration has not been previously made

or

Any change in the Emergency Class

or

Termination of the Emergency.

4.1.4.1.2 The results of ensuing evaluations or assessments of plant conditions

4.1.4.1.3 The effectiveness of response or protective measures taken.

4.1.4.1.4 Information related to plant behavior that is not understood.

CHECKLIST FOR SIGNIFICANT EVENT NOTIFICATION

Complete the applicable portions of this enclosure and transmit to the NRC Operations Center as required by Enclosure 4.1.

State the following to the NRC Operations Center:

"THIS NOTIFICATION IS MADE IN ACCORDANCE
WITH 10CFR50.72. THIS IS DUKE POWER
COMPANY'S CATAWBA NUCLEAR STATION IN
NRC REGION II MAKING THE NOTIFICATION."

1. A. My Name is: _____ My title is: _____
I can be called-back at _____
B. "Your Name Please" _____
2. Time of Notification _____ Event Time _____ EDT.
Event Date / /
 M D Y
3. This Notification is: Check appropriate box(s).
 - a. ☐ -Emergency Plan Declaration ☐ -Other Immediate Notification
☐ - Notification of Unusual Event
☐ - Alert
☐ - Site Area Emergency
☐ - General Emergency
 - b. ☐ -A "ONE-HOUR" Notification
 - c. ☐ -A "FOUR-HOUR" Notification
 - d. ☐ -A "24-HOUR" Notification
4. Event description and cause:

5. Plant Status:

- a. Unit affected: 1/2/Both.
- b. Power prior to event: _____
- c. Power at time of report: _____
- d. Unit tripped: yes/no. Initiating Trip Signal: _____
- e. Mode description: _____
- f. ESF Actuation: yes/no.
- g. Safety Injection or ECCS: yes/no Initiating Signal _____
- h. Primary System Temperature: ^tHot _____,
^tCold _____
- i. NC Flow: yes/no, NC Pump Status: A: on/off, B: on/off,
C: on/off, D: on/off.
- j. Heat Sink: _____
- k. Pressurizer Level: _____
- l. Steam Generator Level(s): A _____ B _____ C _____ D _____
- m. Feedwater Status: Main _____ Aux _____
- n. Containment Pressure: _____ Sump Level: _____
- o. Equipment Failures (Include Status of Safety Systems): _____

- p. Electrical Power Supplies available:
Normal Offsite: yes/no,
Busses/Loads Lost: _____
D/G Running: yes/no, Loaded: yes/no

6. Status of unaffected unit: _____

7. Radioactive Release: yes/no (If yes complete this paragraph)

- a. Release: Liquid/Gas
- b. Location/Source: _____

- c. Release Rate: _____

- d. Duration of Release: _____
- e. Stopped: yes/no
- f. Monitored: yes/no
- g. Estimated Amount Released: _____

- h. Affected Plant/Offsite areas affected: _____

i. Areas Evacuated: _____

j. Other Actions Taken _____

8. Other major problems (Include anything unusual or not understood):

9. Planned actions/Press releases/Emergency Centers activated: _____

10. Outside Agency/Personnel Notified:

Counties:

State(s):

York yes/no
Gaston yes/no
Mecklenburg yes/no

N.C. yes/no
S.C. yes/no

NRC Resident: yes/no

Corporate Headquarters: yes/no,

Others:

REPORT OF SERIOUS PHYSICAL SECURITY EVENTS

DATE/TIME OF NOTIFICATION _____

NRC PERSON NOTIFIED _____

State the following to the NRC Operations Center:

"THIS NOTIFICATION IS MADE IN ACCORDANCE WITH
10CFR73.71. THIS IS DUKE POWER COMPANY'S
CATAWBA NUCLEAR STATION IN NRC REGION II MAKING
THE NOTIFICATION".

My Name is: _____ My title is: _____

I can be reached at _____

"Your Name Please" _____

1. *DATE OF OCCURRENCE: _____ 3.*POWER LEVEL OF UNITS:

2. *TIME OF OCCURRENCE: _____ Unit 1 _____
Unit 2 _____

*If date and time of occurrence are not known, indicate the date and time of
discovery.

4. DESCRIPTION OF EVENT: _____

5. SECURITY RESPONSE/COMPENSATORY MEASURES
ESTABLISHED: _____

6. LLEA (Local Law Enforcement Agency) NOTIFIED? YES ____ NO ____
(If Yes, name organization and telephone number) _____

7. VITAL AREA(S) AFFECTED? YES ____ NO ____
Description of Equipment Systems Affected _____

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1009/04
Change(s) 0 to
OX Incorporated
2-14-85

- (2) STATION: Catawba Nuclear Station
- (3) PROCEDURE TITLE: Environmental Monitoring For Emergency Conditions Within
The Ten Mile Radius Of Catawba Nuclear Station

(4) PREPARED BY: Paul T. Wade DATE: 2-11-85

(5) REVIEWED BY: Fletcher Wilson DATE: 2-11-85

Cross-Disciplinary Review By: _____ N/R: F. Wilson

- (6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: [Signature] Date: 2/12/85

- (8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
ENVIRONMENTAL MONITORING FOR
EMERGENCY CONDITIONS WITHIN THE
TEN MILE RADIUS OF CATAWBA NUCLEAR STATION

1.0 PURPOSE

To provide a method for identifying gaseous plumes or liquid effluent, and obtaining field data indicative of the radiation exposure to the general public following a suspected uncontrolled release of radioactivity. This procedure shall also be implemented by the Crisis Management Center once it is activated.

2.0 REFERENCES

- 2.1 HP/O/B/1000/06 Emergency Equipment Functional Check and Inventory
- 2.2 HP/O/B/1002/04 Collection of Operational Environmental Weekly Samples
- 2.3 HP/O/B/1002/05 Collection of Operational Environmental Monthly Samples
- 2.4 HP/O/B/1002/06 Collection of Operational Environmental Quarterly Samples
- 2.5 HP/O/B/1002/08 Collection of Operational Environmental Semimonthly Samples
- 2.6 HP/O/B/1002/10 Collection of Operational Environmental Semiannual Samples
- 2.7 HP/O/B/1003/05 Operating and Calibration Procedure: Eberline Model PIC-6A Portable Ion Chamber
- 2.8 HP/O/B/1003/12 Operating and Calibration Procedure: Eberline Model E-520 Portable Beta-Gamma Geiger Counter
- 2.9 HP/O/B/1003/17 Operation and Calibration Procedure: Canberra Series - 10 Portable MCA
- 2.10 HP/O/B/1003/31 Operation and Calibration: Eberline Model E140N Portable Count Rate Meter
- 2.11 HP/O/B/1009/16 Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release
- 2.12 HP/O/B/1009/19 Emergency Radio System Operations, Maintenance and Communications

3.0 LIMITS AND PRECAUTIONS

- 3.1 The Field Monitoring Teams (FMT) should park vehicles completely off the road when sampling and use vehicle emergency flashers while stopped.
- 3.2 Four (4) FMTs consisting of two (2) technicians per team and one (1) helicopter team (1 person) if necessary shall be formed as follows:

Team Call Signs

Alpha
Bravo
Charlie
Delta
Echo

Transportation

Land Vehicle
Land Vehicle
Land Vehicle
Land Vehicle
Helicopter

- 3.3 Each FMT shall use particulate masks and protective clothing whenever activity justifies it or when directed by the Field Monitoring Coordinator (FMC).
- 3.4 If the team members are expected to be exposed to I-131 in excess of 70 MPC (6.1×10^{-7} $\mu\text{Ci/ml}$), and directed by the FMC, each team member should ingest a tablet of potassium iodide per Reference 2.11.
- 3.5 Environmental sampling during emergency conditions shall not replace, but rather supplement normal environmental monitoring.
- 3.6 Minimum labeling requirements for all samples are as follows:
- 3.6.1 Date and time.
 - 3.6.2 Location.
 - 3.6.3 Volume of the sample (if applicable).
 - 3.6.4 Name of person sampling.
- 3.7 Each FMT shall maintain open radio communications with the FMC per Reference 2.12. If radio becomes inoperable, call in sample results on a phone at [REDACTED] (Lake Wylie/Charlotte), [REDACTED] (Gaston County), [REDACTED] (Rock Hill and Fort Mill).
- 3.8 If any equipment becomes inoperable, notify the FMC and wait for further instructions.
- 3.9 Annual training in the use of this procedure and the associated equipment and instrumentation shall be conducted and documented on TSR-10.
- 3.10 Portable MCA's shall be picked up at the Health Physics instrument issue point when directed by the FMC. Ensure that the dewars are adequately filled per Reference 2.9.

- 3.11 When returning kits to the Emergency Kit Storage Room, perform an equipment inventory check using the Environmental Survey Kit Checklist (Reference 2.1). Note deviations and forward to the Respiratory/Instrument Calibration Supervisor.

4.0 PROCEDURE

4.1 Activation

- 4.1.1 Upon notification and assembly (FMC), the FMT members shall:
- 4.1.1.1 Report to the Health Physics area on the 609' elevation (on back shifts report to Administration Building) and wait for further instructions from the FMC.
 - 4.1.1.2 Report to the Emergency Kit Storage Room in the Temporary Administration Building to get Environmental Survey Kits.
 - 4.1.1.3 Ensure the Portable Power Generator is operational and the gas can is fully fueled (Reference 2.1).
 - 4.1.1.4 Ensure the tamper seal on the Environmental Survey kits have not been broken and inventory any that have (Reference 2.1).
 - 4.1.1.5 Don TLD and pocket dosimetry and fill out dose cards.
 - 4.1.1.6 Battery and source check survey instruments and portable MCA for proper operation (References 2.7, 2.8, 2.9, 2.10) if applicable.
 - 4.1.1.7 Ensure the portable radios are functional before leaving (Reference 2.12).
 - 4.1.1.8 Obtain emergency vehicles as directed in Enclosure 5.9.
 - 4.1.1.9 Each FMT will proceed to the survey point assigned by the FMC (Enclosure 5.3).
 - 4.1.1.10 The radio operator in the TSC shall complete Radio Operators Log Field Monitoring Data Sheet (Enclosure 5.4), with the appropriate information.

4.2 Locating and Tracking the Plume

- 4.2.1 At the assigned survey point, the FMT shall perform a general area Beta vs. Beta-Gamma survey. This method should be used to locate center and width of plume.

- 4.2.1.1 ^{<v>} Record date, time, location and dose rate (mr/hr) on the Field Monitoring Data Sheet (Enclosure 5.5).
- 4.2.2 If survey results are less than or equal to expected background, call in the results to the FMC and wait for further instructions.
- 4.2.3 If survey results are greater than background, take protective actions as necessary. Then, if directed, take an air sample (volume should be $> 10^6$ ml) equipped with a Silver Zeolite Cartridge and particulate filter.
 - 4.2.3.1 Insert cartridge with arrow pointing in.
 - 4.2.3.2 Insert filter paper with smooth side facing out.
 - 4.2.3.3 Calculate required sample time per Enclosure 5.6.
 - 4.2.3.4 Place the generator and air sampler in a safe location (i.e. away from wet areas and off the roadway) ensuring the sampler is approximately two feet above the ground or higher and begin sampling.
 - 4.2.3.5 When air sample is completed, place the Silver Zeolite Cartridge in a poly bag for analysis.
 - 4.2.3.6 Place filter in a separate poly bag and label.
 - 4.2.3.7 As directed by the FMC, transport the completed sample to a vehicle that is carrying a Canberra Series - 10 Portable MCA for analysis per Reference 2.9.
 - 4.2.3.8 Ensure the correct information is annotated on the Field Monitoring Team Work Sheet for Determining Iodine Activity (Enclosure 5.7).
 - 4.2.3.9 Wait for further instructions from the FMC.
- 4.3 Special Sampling, as directed:
 - 4.3.1 All sampling outside of Auxiliary, Service and Turbine Buildings should be done in conjunction with Operations Support Center (OSC) personnel.
 - 4.3.2 Take smears and place them in separate poly bags, label and retain for later analysis.
 - 4.3.3 Count smears on E140N and record on Field Monitoring Data Sheet (Enclosure 5.5). Call in results to FMC.
 - 4.3.4 Collect water samples in cubitainers using good Health Physics practices and label and retain for later analysis.

- 4.3.5 Place TLD's in the environment.
 - 4.3.6 Retrieve and replace air sample and/or TLD's that are already located in the environment. Locations are listed in Enclosure 5.1. Place samples in separate poly bags, label and retain for later analysis.
 - 4.3.7 Collect broad leaf vegetation sample label and retain for later analysis (Reference 2.12).
 - 4.3.7.1 Cut vegetation in a one square meter area approximately two inches above the ground.
- NOTE: Vegetation which leaves are not in the shape of needles, i.e. pine or spruce needles.
- 4.3.8 Collect shoreline sediment sample (one liter) label and retain for later analysis (Reference 2.6).
 - 4.3.9 Collect milk sample (one full cubitainer) label and retain for later analysis (Reference 2.5). Locations are listed in Sample Enclosure 5.2.

4.4 Turnover

- 4.4.1 Each FMT shall be relieved as directed by the FMC.
- 4.4.2 Inform the relief FMT on the status of the following:
 - 4.4.2.1 Radiation surveys and dose rates in the plume area.
 - 4.4.2.2 Kit Inventory consumed.
 - 4.4.2.3 Equipment operating status.
 - 4.4.2.4 Any sampling problems.
 - 4.4.2.5 Plant status information.
- 4.4.3 Direct the relief FMT to don TLD's and pocket dosimetry and fill out dose cards.
- 4.4.4 Return all samples to the Emergency Kit Storage Room as directed by the FMC.
- 4.4.5 Turn in all data sheets to the FMC or his designee.

5.0 ENCLOSURES

- 5.1 Air Sampler, TLD, and Water Sample Locations
- 5.2 Milk Sample Locations

- 5.3 Predetermined Sampling Locations
- 5.4 Sample of Radio Operators Log Field Monitoring Survey Data
- 5.5 Sample of Field Monitoring Data Sheet
- 5.6 Sample Time Required For Minimum Sample Volume
- 5.7 Sample of Field Monitoring Team Work Sheet For Determining Iodine Activity
- 5.8 TSC Field Monitoring Organization
- 5.9 Emergency Vehicles

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.1
 AIR SAMPLER, TLD, AND WATER SAMPLE LOCATIONS

Air Sample Locations (need key CPD-1)

<u>Zone</u>	<u>& Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	1	Hwy 274-N, right Liberty Hill Rd., right in fork to end (Air CNS #200, need key).
A0	1	5	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd., left on Blue Bird Ln., through gate to end (Air CNS #201, need key).
B1	3	1	Hwy 49-N, right Hwy 160, right at Tega Cay sign (98), right before Tega Cay entrance into Duke Power Company substation (Air CNS #212, need key).
C2	10	5	Hwy 274-S, left Hwy 161, right Mt. Gallant Rd. (195), right Hwy 21-121 By-Pass, right on Hwy 72 - 121 By-pass, left on dirt road (Trash Pile Rd.) across from Wayne's Auto Service, go to Duke Power Company substation (Air CNS #217, need key).
A0	1	26	Behind Catawba Nuclear Station overlook (Air CNS #205, need key).

TLD Locations

I. Site Boundary TLD's

<u>Zone</u>	<u>& Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	44	Hwy 274-N, right Liberty Hill Rd., right in fork, pass softball field to large rocks at fence on right. TLD is on fence (TLD CNS #222).
A0	1	1	Hwy 274-N, right Liberty Hill Rd., right in fork to end (TLD CNS #200, need key).
A0	1	5	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd., left on Blue Bird Ln., through gate to end (TLD CNS #201, need key).
A0	1	8	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd. Go to first drive on right past Paradise Pl., TLD across road (TLD CNS #202).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.1

AIR SAMPLER, TLD. AND WATER SAMPLE LOCATIONS

<u>Zone</u>	<u>& Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	11	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd. TLD is .1 miles on left in curve (TLD CNS #223).
A0	1	14	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd. TLD .2 miles on right (TLD CNS #224).
A0	1	45	Left at Steam Production entrance on Concord Rd., left on Old Concord Rd. to end. TLD on fence on left (TLD CNS #203).
A0	1	17	Left at Steam Production entrance on Concord Rd. to first transmission tower on left after bridge (TLD CNS #225).
A0	1	20	Left at Steam Production entrance on Concord Rd., TLD on left across bridge just past fence (TLD CNS #226).
A0	1	23	Left at Steam Production entrance on Concord Rd., TLD on left at beginning of guardrail posts (TLD CNS #204).
A0	1	26	Behind Catawba Nuclear Station overlook (TLD CNS #205).
A0	1	29	Left at Steam Production entrance on Concord Rd., TLD at Shady Shore Dr. on right corner at Bethel Community Clubhouse sign (TLD CNS #227).
A0	1	32	Right at Steam Production entrance on Concord Rd., TLD at first dirt left (Valelake Dr.) on right corner (TLD CNS #228).
A0	1	35	TLD on top of hill at Catawba Nuclear Station Construction entrance on North side of street (TLD CNS #206).
A0	1	38	Hwy 274-N, right at Liberty Hill Rd., right in fork to third power line on right, walk about 200 yds. South along boundary fence. TLD on fence (TLD CNS #229).
A0	1	41	Hwy 274-N, right at Liberty Hill Rd., go .8 miles (right in fork) TLD on fence on right (TLD CNS #207).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.1

AIR SAMPLER, TLD, AND WATER SAMPLE LOCATIONS

<u>Zone & Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
II. 4-5 Mile TLD's		
F1 4	4	Hwy 49-N to River Hills Plantation rear entrance at Robinwood Rd. TLD behind green building on right corner (TLD CNS #230).
F1 4	6	Hwy 49-N to River Hills Plantation front entrance guardhouse (TLD CNS #231).
A1 4	2	Hwy 49-N to intersection of Pleasant Hill Rd. (1109), TLD on power line (TLD CNS #232).
A1 4	4	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left Zoar Rd. (1105), right Thomas Rd. (1104), TLD behind second house on right (TLD CNS #233).
B2 4	2	Hwy 49-N, right Hwy 160 to Home Federal Savings and Loan on left. TLD on left rear corner of building. (TLD CNS #234).
B1 4	3	Hwy 49-N, right Hwy 160, right on Dam Rd. (99), last gravel right in sharp curve before Lake Wylie Dam, left through fence to substation, TLD on right of inner substation fence (TLD CNS #235).
C1 4	1	Hwy 274-S, left Mt. Gallant Rd. (195), left India Hook Rd. (30) to S.C. Wildlife Resources Dept (TLD CNS #236).
C1 4	3	Hwy 274-S, left Mt. Gallant Rd. (195), right Homestead Rd. (657) to end, TLD straight across intersection of Twin Lakes Rd. (TLD CNS #237).
C1 4	5	Hwy 274-S, left Mt. Gallant Rd. (195), right W. Oak Dr. (962) to end at fork, TLD on left at fence (TLD CNS #238).
D1 5	1	Hwy 274-S to Carter Lumber Co., TLD on fence near gate (TLD CNS #239).
D1 4	2	Hwy 274-S, right Campbell Rd. (80), left on Paraham Rd. (54) to transmission tower on right, TLD on brown power pole (TLD CNS #240).
D1 5	4	Hwy 274-S, right Campbell Rd, (80) for about 3 miles, TLD on left at beginning of horse fence (TLD CNS #241).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.1

AIR SAMPLER, TLD, AND WATER SAMPLE LOCATIONS

<u>Zone</u>	<u>& Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
E1	5	2	Hwy 49-S, right Paraham Rd, (54) to transmission tower on left after bridge (TLD CNS #242).
E1	5	3	Hwy 274-N, left Hwy 55, left Kingsberry Rd. (114) to transmission tower on left (TLD CNS #243).
F1	4	1	Hwy 274-N, left Hwy 55 to Bethel School, TLD on side of small building in back (TLD CNS #244).
F1	4	3	Hwy 274-N left on Glenvista Rd. to Crowder Creek Boat Landing, TLD to East of parking lot (TLD CNS #245).
B2	8	1	Hwy 49-N, right Carowinds Blvd. (1441), left Choate Cir., TLD on inside of fence left of the guardhouse (TLD CNS #246).
B1	3	1	Hwy 49-N, right Hwy 160, right Tega Cay sign (98), right before Tega Cay entrance into Duke Power Company substation (TLD CNS #212).
B2	7	6	Hwy 49-N, right Hwy 160 to Fort Mill, right Lee St., left Self St., TLD at Fort Mill Municipal Water Supply behind Springs Mill (TLD CNS #247).
C2	7	3	Hwy 274-S, right on Herlong Ave. to Piedmont Medical Center emergency entrance to back of hospital. TLD on fence at back right corner of Liquid Oxygen storage area (TLD CNS #248).
C2	10	5	Hwy 274-S to Newport, left at stop light, right on Rawlinson Rd., left Hwy 5, right on Heckle Blvd. (901) to end, left on Hwy 72, right on dirt road just across from Wayne's Auto Service, go to Duke Power Company Substation (TLD CNS #217).
C2	8	6	Hwy 274-S, left Hwy 161, right Rawlinson Rd. (56), left Hwy 5 to Rock Hill Career Development Center, TLD on transmission tower (TLD CNS #249).

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.1

AIR SAMPLER, TLD, AND WATER SAMPLE LOCATIONS

<u>Zone</u>	<u>& Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
D2	10	4	Hwy 274-S, right Campbell Rd. (80), left Hwy 49-S, left Rd. 64, left Hwy 5. Go to Duke Power Company Appliance Center on left. TLD on fence in back (TLD CNS #250).
E2	10	2	Hwy 55 into Clover, TLD at Duke Power Company Appliance Center in rear lot on inner fence (TLD CNS #251).
<u>Water Sample Locations</u>			
F3	14	4	Hwy 274-N, right Pole Branch Rd. (279), right Hwy 273 into Belmont, right Catawba St., left at next light to Belmont Municipal Water Supply (Water CNS #218).
C2	7	2	Hwy 274-S, left Hwy 161, right Mt. Gallant Road (195) to end. Rock Hill Municipal Water Supply across intersection on left (Water CNS #214).
B2	7	6	Hwy 49-N, right Hwy 160 to Fort Mill, right Lee St., left Self St., go to Fort Mill Municipal Water Supply behind Springs Mill (Water CNS #213).
A0	1	46	Left exiting Steam Production entrance on Concord Rd., left just after canal bridge. Go to pier (water CNS #208, need key).
B1	4	5	Hwy 49-N, right Hwy 160, right Dam Rd. (99), left Gray Rock Rd. (251) to Lake Wylie Dam. Walk through plant to upstream side of the dam (water CNS #211).
B1	4	6	Hwy 49-N, right Hwy 160, right Dam Rd. (99), left Gray Rock Rd., (251) to Lake Wylie Dam. Ride or walk to river access on downstream side of dam.
C2	7	8	Hwy 274-S left Mt. Gallant Rd. (195), left Hwy 161, left Cherry Rd. (Hwy 21), left on dirt road at Fort-Rock Drive-In to end, go right to Rock Hill Municipal water intake.
A1	4	6	Hwy 49-N, left at Camp Steere sign after crossing Buster Boyd Eridge (Water CNS #215).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.2
 MILK SAMPLE LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>Milk</u>	
D1	6	M	Hwy 274-S, right Hwy 161, left Rd. 1080 to Pursley Dairy.
D2	8	M	Hwy 274-S, right Hwy 161, left Scism Dairy and Equipment Co. (CASE sign).
E2	6	M	Hwy 274-N, left Hwy 55, left Clinton Dairy Rd.
F1	3	M	Hwy 274-N, right Lake Wylie Rd. (1099) to first house on left, (Ingram Richmond residence).
F2	7	M	Hwy 274-N, Hwy 55, right Paraham Rd. (54), left Hwy 557. Barnett Dairy 1 mile on left.
D1	7	M	Hwy 274-S to Newport, left at stop light, right Adnah Church Rd. (81). Woods Dairy 1.5 miles on left.
F2	13	M	Hwy 274-N, left Hwy 55, go through Clover, SC. Right on Lloyd White Rd. (148), left on Crowders Creek Rd. (1103), next paved right (1125). Oates Dairy is half mile on left.

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	1	Hwy 274-N, right Liberty Hill Rd., right in fork to end (TLD & Air CNS #200, need key).
A0	1	2	Hwy 274-N, right Lake Wylie Rd. (1099), right at Hudson Rd. fork, right at Commodore Pl. fork, left on Tioga Rd. to end.
A0	2	3	Hwy 274-N, right Lake Wylie Rd., (1099), left fork after pavement ends, on Hudson Rd. to end.
A0	2	4	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102) to dead end at Catawba Yacht Club.
A0	1	5	Left exiting Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd., left on Blue Bird Ln. through gate to end (TLD & Air CNS #201, need key).
A0	1	6	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left on Snug Harbor Rd. (1357), right Coze Cove Rd. (1434) to end.
A0	2	7	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), to intersection of Snug Harbor Rd. (1357).
A0	1	8	Left exiting Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Rd. Go to first drive on right past Paradise Pl., TLD across road (TLD CNS #202).
A0	1	9	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left Snug Harbor Rd. (1357) to end.
A0	2	10	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left Snug Harbor Rd. (1357), stay on Snug Harbor at Kalabash Rd. Fork, take first gravel left (Crosshavens Dr.) after fork to the end (Beware of dogs).

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.3
PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	11	Left exiting Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd., left on Crepe Myrtle Road. TLD is .1 miles on left in curve (TLD CNS #223).
A0	1	12	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left McKee Rd (1100), right Bankhead Rd. to end.
A0	2	13	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left McKee Rd. (1100), right Bankhead Rd. to intersection of Bessbrook Rd.
A0	1	14	Left exiting Steam Production entrance on Concord Rd., left on Old Concord Rd., right on Acacia Rd. TLD .2 miles on right (TLD CNS #224).
A0	1	15	Left exiting Steam Production entrance on Concord Rd., take first dirt fork to left on Kingsberry Dr., Stop at Commodore Yacht Club.
A0	1	16	Left exiting Steam Production entrance on Concord Rd. to last big curve before pavement ends.
A0	1	17	Left exiting Steam Production entrance on Concord Rd. to first transmission tower on left after bridge (TLD CNS #225).
A0	1	18	Left exiting Steam Production entrance on Concord Rd., go to end and turn right on Sandlapper Rd. Stop at transmission tower.
A0	2	19	Hwy 274-S, left Allison Creek Rd. (1081) to end of pavement.
A0	2	20	Left exiting Steam Production entrance on Concord Rd. TLD on left across bridge, just past fence (TLD CNS #226).
A0	1	21	Left Hwy 274-S, left Allison Creek Rd. (1081), left Spratt Rd., to end (Beware of dogs).
A0	2	22	Hwy 274-S, left Allison Creek Rd. (1081) to intersection of Bardale Rd.

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/0/2/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	1	23	Left exiting Steam Production entrance on Concord Rd. TLD on left at beginning of guardrail posts (TLD CNS #204).
A0	1	24	Hwy 274-S, left Allison Creek Rd. (1081), left at Spratt Rd., left Morrison Rd., then right in next 2 forks, left in next fork to end.
A0	2	25	Hwy 274-S, left Allison Creek Rd. (1081), to intersection of Spratt Rd.
A0	1	26	Behind Catawba Nuclear Station overlook (TLD and Air CNS #205, need key).
A0	1	27	Right exiting Steam Production entrance on Concord Rd., first dirt left on Valelake Rd., left in fork to end.
A0	2	28	Hwy 274-S, left Allison Creek Rd. (1081) to intersection of Colina Rd.
A0	1	29	Left exiting Steam Production entrance on Concord Rd. TLD at Shady Shore Dr. on right corner at Bethel Community Clubhouse sign (TLD CNS #227).
A0	1	30	Right exiting Steam Production entrance on Concord Rd., first dirt left on Valelake Rd., right in fork to end.
A0	2	31	Hwy 274-S to intersection of Campbell Rd. (80).
A0	1	32	Right exiting Steam Production entrance on Concord Rd. TLD at first dirt left (Valelake Dr.) on right corner (TLD CNS #228).
A0	1	33	Right exiting Steam Production entrance on Concord Rd., left on dirt road (Pine Pt. Dr.) just before Granny's Restaurant, stop .5 miles.
A0	2	34	Hwy 274-S to Big Allison Creek bridge.
A0	1	35	TLD on top of hill at intersection of Catawba Nuclear Station Construction entrance and Road 1132 (TLD CNS #206).
A0	1	36	Right exiting Steam Production entrance to transmission line just before Granny's Restaurant on Concord Rd. (1132).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A0	2	37	Hwy 274-N, left Liberty Hill Rd., take first left and go to end.
A0	1	38	Hwy 274-N, right at Liberty Hill Rd., right in fork to third transmission line on right, walk about 200 yds. South along boundary fence. TLD is on fence (TLD CNS #229).
A0	1	39	Hwy 274-N, right at Liberty Hill Rd., right in fork to third transmission line on right.
A0	2	40	Right exiting Steam Production entrance on Concord Rd. to end. Right on Hwy 274-N for 1 mile.
A0	1	41	Hwy 274-N, right at Liberty Hill Rd., go .8 miles (right in fork), TLD on fence on right (TLD CNS #207).
A0	1	42	Hwy 274-N, right at Liberty Hill Rd., right in fork, go to softball field entrance.
A0	2	43	Hwy 274-N, right Lake Wylie Rd. (1099), right Beaver Creek Trail to end.
A0	1	44	Hwy 274-N, right at Liberty Hill Rd., right in fork, pass softball field to large rock piling on fence. TLD is on fence (TLD CNS #222).
A0	1	45	Left exiting Steam Production entrance, left on Old Concord Rd. to end. TLD on fence on left (TLD CNS #203).
A0	1	46	Left exiting Steam Production entrance on Concord Rd. Turn left just after canal bridge. Go to pier (water CNS #208, need key).
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A1	3	1	Hwy 49-N to NC side of Buster Boyd Bridge.
A1	4	2	Hwy 49-N to intersection of Pleasant Hill Rd. (1109), TLD on transmission tower (TLD CNS #232).
A1	5	3	Hwy 49-N to Steele Creek Vol. Fire Dept. on right.

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
A1	4	4	Hwy 49-N, right Pleasant Hill Rd (1109), right Youngblood Rd. (1102), left Zoar Rd. (1105), right Thomas Rd. (1104, TLD behind second house on right in pines (TLD CNS #233).
A1	5	5	Hwy 49-N, right Pleasant Hill Rd. (1109, right Youngblood Rd. (1102), left Hamilton Rd. (1106) to intersection of Hwy 160.
A1	4	6	Hwy 49-N, left at Camp Steere sign after crossing Buster Boyd Bridge (Water CNS #215).
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A2	10	1	Hwy 49-N, stop one mile past Westinghouse Blvd. at Roberts Systems 8500 on left.
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A3	10	1	Hwy 49-N, right Carowinds Blvd. (1441), left Hwy 51 to Pineville, stop near Sugar Creek bridge.
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B1	3	1	Hwy 49-N, right Hwy 160, right on Gold Hill Rd. (98) at Tega Cay sign, right before Tega Cay entrance on gravel road into Duke Power Company substation (TLD & Air CNS #212, need key).
B1	2	2	Hwy 49-N, right Pleasant Hill Rd. (1109), right Youngblood Rd. (1102), left McKee Rd (1100)., left Bankhead Rd., left Bessbrook Rd. to end.
B1	4	3	Hwy 49-N, right Hwy 160, right on Dam Rd. (99), last gravel right in sharp curve before Lake Wylie Dam, left through fence to substation, TLD on right of inner substation fence (TLD CNS #235).
B1	2	4	Hwy 49-N, right Hwy 160, right on Gold Hill Rd. (98) at Tega Cay sign, enter Tega Cay following Tega Cay Dr., right Windjammer Dr., 6 miles, Right at circle, Left Kiwi Point to end.

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
B1	4	5	Hwy 49-N, right Hwy 160, right Dam Rd. (99), left Gray Rock Rd. (251) to Lake Wylie Dam. Walk through plant to upstream side of the dam (water CNS #211).
B1	4	6	Hwy 49-N, right Hwy 160, right Dam Rd. (99), left Gray Rock Rd. (251) to Lake Wylie Dam. Go to river access on downstream side of dam.
B2	8	1	Hwy 49-N, right Carowinds Blvd. (1441), left Choate Circle, TLD on inside of fence left of the guardhouse (TLD CNS #246).
B2	4	2	Hwy 49-N, right Hwy 160 to Home Federal Savings and Loan on left. TLD on left rear corner of building (TLD CNS #234).
B2	5	3	Hwy 49-N, right Hwy 160, left on Gold Hill Rd. (98) at Home Federal Savings and Loan, stop at intersection of Whitley Rd.
B2	10	4	Hwy 49-N, right Carowinds Blvd. (1441), left Hwy 51 to Pineville, right Hwy 521 (Polk St.) in Pineville, right on Dorman Rd., stop at state line.
B2	5	5	Hwy 49-N, right Hwy 160, right Sutton Rd. (49) to intersection of Gray Rock Rd. (251).
B2	7	6	Hwy 49-N, right Hwy 160 to Fort Mill, Right Lee St., left Self St. TLD at Fort Mill Municipal Water Supply on right behind Springs Mill (TLD CNS #247, also Water CNS #213).
B2	10	7	Hwy 49-N, right Hwy 160 through Fort Mill to the Sugar Creek bridge.
C1	4	1	Hwy 274-S, left Mt. Gallant (195), left India Hook Rd. (30) to SC Wildlife Resources Dept. (TLD CNS #236).
C1	5	2	Hwy 274-S, left Mt. Gallant Rd. (195), go beyond India Hook to Red Burketts Body Shop on right.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.3
PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
C1	4	3	Hwy 274-S, left Mt. Gallant Rd. (195), right Homestead Rd. (657) to end. TLD straight across intersection of Twin Lakes Rd. (TLD CNS #237).
C1	5	4	Hwy 274-S, left Mt. Gallant Rd. (195), right Homestead Rd. (657) to end.
C1	4	5	Hwy 274-S, left Mt. Gallant Rd. (195), right W. Oak Dr. (962) to end at fork. TLD on left at fence (TLD CNS #238).
C1	5	6	Hwy 274-S, left Mt. Gallant Rd. (195), right at York County Museum (658) to end at SC National Guard Armory.
C1	5	7	Hwy 274-S to Carter Lumber Co.
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C2	10	1	Hwy 274-S, left Hwy 161, left in fork on Celanese Rd. (50) to intersection of Springdale Rd.
C2	7	2	Hwy 274-S, left Hwy 161, right Mt. Gallant Rd. (195) to end. Go to Rock Hill Municipal Water Supply across intersection on left (Water CNS #214).
C2	7	3	Hwy 274-S, right on Herlong Ave. to Piedmont Medical Center emergency entrance to back of hospital. TLD on fence at back right corner of Liquid Oxygen storage area (TLD CNS #248).
C2	10	4	Hwy 274-S, left Hwy 161, right Mt. Gallant Rd. (195), right Hwy 21-121 By-pass to Fast Fare on left at intersection of Springsteen Rd.
C2	10	5	Hwy 274-S to Newport, left at stop light, right on Rawlinson Rd., left Hwy 5, right on Heckle Blvd. (901) to end, left on Hwy 72, right on dirt road across from Wayne's Auto Service. Go to Duke Power Company substation (TLD & Air CNS #217, need key).
C2	8	6	Hwy 274-S, left Hwy 161, right Rawlinson Rd. (56), left Hwy 5 to Rock Hill Career Development Center, TLD on transmission tower (TLD CNS #249).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
C2	10	7	Hwy 274-S, left Hwy 161, right Adnah Church Rd. (81), right on Hwy 5, left on Eastview Rd. (102) to intersection of Oak Park Rd. (103).
C2	7	8	Hwy 274-S, left Mt. Gallant Rd. (195), left Hwy 161, left Hwy 21, left on dirt road at Fort-Rock Drive-In to end, go right to Rock Hill Municipal Water Intake.
D1	5	1	Hwy 274-S to Carter Lumber Co. TLD on fence near gate (TLD CNS #239).
D1	4	2	Hwy 274-S, right Campbell Rd. (80), left Paraham Rd. (54) to transmission tower on right, TLD on power pole (TLD CNS #240).
D1	5	3	Hwy 274-S, right Campbell Rd. (80), left Paraham Rd. (54), next right on Rd. 815 to Allison Creek bridge.
D1	5	4	Hwy 274-S, right Campbell Rd. (80) for about 3 miles, TLD on left at beginning of horse fence (TLD CNS #241).
D2	10	1	Hwy 274-S, left Hwy 161, right Adnah Church Rd. (81), right Hwy 5, quick left on Eastview Rd. (102), right Holland Rd. (157), right Turkey Farm Rd. (1172), left Russell Rd. (536), go .2 miles.
D2	10	2	Hwy 274-S, left Hwy 161, right Adnah Church Rd. (81), right Hwy 5, left Billy Wilson Rd. (1451), right Turkey Farm Rd. (1172) to Fishing Creek bridge.
D2	10	3	Hwy 274-S, right Campbell Rd. (80), left Hwy 49-S, stop at Pantry before entering York.
D2	10	4	Hwy 274-S, right Campbell Rd. (80), left Hwy 49-S, left Rd. 64, left Hwy 5. Go to Duke Power Company Appliance Center on left. TLD on fence in back (TLD CNS #250).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
D2	10	5	Hwy 274-S, right Campbell Rd. (80), left 49-S, right Old Lime tone Rd. (172) to end.
E1	5	1	Hwy 274-S, right Campbell Rd. (80) to intersection of Hwy 49.
E1	5	2	Hwy 49-S, right Paraham Rd. (54) to transmission tower on left after bridge (TLD CNS #242).
E1	5	3	Hwy 274-N, left Hwy 55, left Kingsberry Rd. (114) to transmission tower on left (TLD CNS #243).
E1	5	4	Hwy 274-N, left Hwy 55 to intersection of Kingsberry Rd. (114).
E2	5	1	Hwy 274-S, right Campbell Rd. (80), right Paraham Rd. (54) to intersection of Dr. Nichols Rd. (819).
E2	10	2	Hwy 274-N, left Hwy 55 into Clover, go to Duke Power Company Appliance Center on left. TLD on fence in back (TLD CNS #251).
E2	10	3	Hwy 274-N, left Hwy 55 to Pantry at intersection of Hwy 321 in Clover (behind Pantry).
F1	4	1	Hwy 274-N, left Hwy 55 to Bethel School. TLD on side of small building in back (TLD CNS #244).
F1	5	2	Hwy 274-N, left Hwy 55, right Bethel School Rd. (152) to intersection of Hollandale Dr.
F1	4	3	Hwy 274-N left on Glenvista Rd. to Crowder Creek boat landing, TLD to east of parking lot (TLD CNS #245).
F1	4	4	Hwy 49-N to River Hills Plantation rear entrance at Robinwood Rd. TLD behind green building on right corner (TLD CNS #230).

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.3
 PREDETERMINED SAMPLING LOCATIONS

<u>Zone</u>	<u>Radius (Mi)</u>	<u>No.</u>	<u>Description</u>
F1	5	5	Hwy 49-N, left Sherer Church Rd. to end.
F1	4	6	Hwy 49-N to River Hills Plantation entrance guardhouse (TLD CNS #231).
F1	5	7	Hwy 49-N, left Montgomery Rd. at the River Rat Restaurant. Stop in horseshoe curve near lake.
<hr/>			
F2	10	1	Hwy 274-N, left Hwy 557, right Ridge Rd. (27) to Bowling Green Presbyterian Church.
F2	5	2	Hwy 274-N, left Hwy 557 to Pine Grove Baptist Church.
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F3	10	1	Hwy 274-N, left Hwy 557, next paved right on Oakridge Rd. at Bethel Fire Dept. (Rd. 435) to intersection of Hwy 274 (in NC).
F3	10	2	Hwy 274-N, right Pole Branch Rd. (279) to Friendship Baptist Church on left.
F3	10	3	Hwy 274-N, right Pole Branch Rd. (279), right Hwy 273 to Allen Steam Plant Bridge.
F3	14	4	Hwy 274-N, right Pole Branch Rd. (279), right Hwy 273 into Belmont, right Catawba St., left at next light to Belmont Municipal Water Supply (Water CNS #218).

Date _____
 FMC _____
 Radio Operator _____

Smear
Activity (CCPM)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 HP/O/B/1009/04
 ENCLOSURE 5.6

SAMPLE TIME REQUIRED FOR MINIMUM SAMPLE VOLUME

FLOW RATE

MINIMUM REQUIRED SAMPLING TIME IN MINUTES

CFM	LPM	
.5	= 14	71
1.0	= 28	36
1.5	= 42	24
2.0	= 56	18
2.5	= 70	15
3.0	= 84	12
3.5	= 99	11
4.0	= 113	9
4.5	= 127	8

NOTE: When estimating time required to get a minimum volume of 1×10^6 ml if flow rate for the air sampler in use is not on table, go to next Lower flow rate. The LPM are rounded off to the conservative side.

Example: Air Sampler flow rate = 106 LPM. Minimum time 11 minutes

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.7

Page 1 of 2

FIELD MONITORING TEAM WORK SHEET FOR DETERMINING IODINE ACTIVITY

Team Members _____ Date _____ Air Sampler No. _____

Team Call Sign _____ Canberra No. _____

AIR SAMPLE INFORMATION

ANALYSIS RESULTS

A Sample ID. No./Time/Location	B Air Sampler Run Time (Min)	C Flow Rate (LPM)	D Iodine Activity Microcuries/ml	E Dose Rate mrem/hr	F Results Reported By:
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____
____/____/____	_____	_____	_____	_____	_____

Column A) Number of Sample/Time it was Taken/Sampling Location (ex. A0-2-10).
Column B) Length of time the air sampler ran.
Column C) Air sampler meter flow rate.
Column D) Activity from Canberra.
Column E) Dose rate from Canberra.
Column F) Signature of person that calls in results to FMC.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.7
OPERATOR GUIDELINES

Page 2 of 2

5.6.1 MCA and Detector Set-Up

- 5.6.1.1 Disconnect DC power cord from unit.
- 5.6.1.2 Turn the contrast switch on the front of the unit clockwise to the ON mode.
- 5.6.1.3 Place sample holder with Na-22 check source onto the detector.
- 5.6.1.4 Press TEST SYSTEM.
- 5.6.1.5 Press ENTER to begin test.
- 5.6.1.6 If test failed, press CLEAR ENTRY and remove the instrument from service.
- 5.6.1.7 If test passed, press ENTER.

5.6.2 Collecting and Measuring Filter Cartridges

NOTE: Record data on Field Monitoring Team Work Sheet for Determining Iodine Activity (Sample Enclosure 5.6).

- 5.6.2.1 Press ANALYZE FILTER SAMPLE.
- 5.6.2.2 Press ENTER.
- 5.6.2.3 For each sample:
 - 5.6.2.3.1 Place cartridge with the recognizable side toward the detector (in small poly bag) in sample holder.
 - 5.6.2.3.2 Put detector and sample holder in shield.
 - 5.6.2.3.3 Press ENTER to accept ID number.
 - 5.6.2.3.4 Press ENTER to accept current Flow Rate (LPM). Otherwise, change number and press ENTER.
 - 5.6.2.3.5 Press ENTER to accept current Flow Time (min). Otherwise, change number and press ENTER.
 - 5.6.2.3.6 If the volume is determined to be too small, resample, press ENTER and return to Step 5.6.2.3.
 - 5.6.2.3.7 Press ENTER to start Collect/Analyze.
 - 5.6.2.3.8 Report/Record Iodine activity ($\mu\text{Ci/ml}$) and dose rate (mrem/hr).
 - 5.6.2.3.9 Press NEXT SAMPLE.
 - 5.6.2.3.10 Label the cartridge and retain for later analysis.

5.6.3 After sampling completion, turn the contract switch counter-clockwise to the STAND-BY mode.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/0/B/1009/04
ENCLOSURE 5.8
TSC FIELD MONITORING ORGANIZATION

<u>POSITION</u>	<u>NAME</u>	<u>BUSINESS PHONE</u>	<u>HOME PHONE</u>
-----------------	-------------	-----------------------	-------------------

Field Monitoring Coordinators:

Primary: C. V. Wray

Alternates: R. L. Rivard
J. E. Threatt

TSC Radio Operators:

Primary: D. E. Sexton

Alternate: T. W. O'Donohue

Field Monitoring Teams:

All Health Physics personnel with Field Monitoring Training.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/04
ENCLOSURE 5.9
EMERGENCY VEHICLES

The two designated emergency vehicles are the Operations pick-up truck and the Technical Services vehicle used primarily by Chemistry. These two vehicles are to be obtained (as directed by the FMC) by getting the keys from the front desk Security Officer. A set of all keys to station vehicles shall be maintained by Security at the Personnel Access Portal (PAP).

Obtain any other Station vehicles (if available) as directed by the FMC. Voluntary use of personal vehicles is another alternative that may be considered.

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

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1009/13
Change(s) 0 to
2 Incorporated

- (2) STATION: Catawba
- (3) PROCEDURE TITLE: Offsite Dose Protection - Uncontrolled Release of
Radioactive Material Through the Unit Vent

(4) PREPARED BY: Brian Chundelik DATE: 1/30/85

(5) REVIEWED BY: R. D. Leland DATE: 2-1-85

Cross-Disciplinary Review By: _____ N/R: R. Leland

(6) ~~TECHNICAL~~ APPROVAL (IF NECESSARY):

By: _____ (SPN) Date: _____

By: _____ Date: _____

(7) APPROVED BY: J. L. By Date: 2/4/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
OFFSITE DOSE PROJECTION - UNCONTROLLED RELEASE
OF RADIOACTIVE MATERIAL THROUGH THE UNIT VENT

1.0 PURPOSE

This procedure describes the method for projecting the potential offsite dose following an uncontrolled release of radioactive materials through the unit vent.

2.0 REFERENCES

- 2.1 Letter from Civil/Environmental Division CN-1108.1, 1434.00, 1227.00 Atmospheric Dispersion Factor for Emergency Planning
- 2.2 EPA-520/1-75-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents
- 2.3 Regulatory Guide 1.109, Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I
- 2.4 Regulatory Guide 1.4, Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors

3.0 LIMITS AND PRECAUTIONS

- 3.1 Use actual sample data when possible. Radiation monitor readings are susceptible to several sources of error. When radiation monitor readings are used for downwind concentrations, note this in the report of offsite dose assessment.
- 3.2 Environmental data should be collected and analyzed to verify these calculations. This procedure considers all releases to be ground level releases.
- 3.3 This procedure applies to releases made from Catawba Nuclear Station only. Many of the values contained in this procedure are site specific.
- 3.4 Reporting requirements of Station Directive 2.8.1 and HP/O/B/1009/02 shall be evaluated to ensure that the Shift Supervisor and/or the Licensing Engineer are informed of the requirements.

4.0 PROCEDURE

- 4.1 Obtain the following information from the Control Room and record it on Enclosure 5.1 (Vent Release Data Sheet).

- 4.1.1 Time of reactor trip.
- 4.1.2 Tower wind speed in MPH.
(Lower tower wind speed preferred.)
- 4.1.3 Direction from which the wind is blowing in degrees from North. (Upper tower wind direction preferred.)
- 4.1.4 Temperature gradient (ΔT) in degrees C.
- 4.1.5 Vent discharge flow rate in CFM.
- 4.1.6 Available weather forecast information.
- 4.2 Determine the release concentration as follows:
 - 4.2.1 If vent sample analysis is not available, go to Step 4.2.4.
 - 4.2.2 Obtain the following vent sample analysis results--and
record on Enclosure 5.1:
 - 4.2.2.1 Date/time of sample.
 - 4.2.2.2 Gross noble gas concentration in $\mu\text{Ci/ml}$.
 - 4.2.2.3 Iodine equivalent concentration (or data for calculation).
 - 4.2.2.4 Gamma E-bar value in mev/dis (or data for calculation).
 - 4.2.3 Go to Step 4.3
 - 4.2.4 Obtain the following unit vent data and record on sample Enclosure 5.1:
 - 4.2.4.1 Date/Time of collection.
 - 4.2.4.2 EMF36 Low and High range readings in cpm (gas monitor).
 - 4.2.4.3 ΔEMF37 reading in cpm (iodine monitor).
 - 4.2.4.4 Δt in minutes for ΔEMF37 reading.
 - 4.2.4.5 Calculate release concentrations as shown on Enclosure 5.1.
- 4.3 Project the impact of the release on the downwind population by using the manual calculations outlined below.
 - 4.3.1 Determine the X/Q values for each point of interest downwind as follows.

NOTE: If no points have been requested, use the .5, 2, 5 and 10 mile values.

4.3.1.1 From Enclosure 5.2 (Table of Two-Hour Relative Concentration Factors), locate the relative two hour concentration value (CH) for each point and record on sample Enclosure 5.3 (Manual Calculation Worksheet), (Reference 2.3).

4.3.1.2 Convert these values to X/Q by,

$$X/Q = \frac{CH(MPH \cdot \text{Sec}/m^3)}{\text{Wind Speed (MPH)}}$$

4.3.1.3 Record results on Enclosure 5.3 (Manual Calculation Worksheet).

4.3.2 Calculate the gas and iodine downwind concentrations for each point using the equation,

$$\text{Conc}_{DW} = \text{Conc}_V \cdot F_V \cdot X/Q \cdot U_{DWC}$$

Conc_{DW} = downwind concentration ($\mu\text{Ci}/\text{ml}$)

Conc_V = vent discharge concentration ($\mu\text{Ci}/\text{ml}$)

F_V = vent discharge flow rate (CFM)

X/Q = dispersion factor in sec/m^3

U_{DWC} = unit conversions derived from,

$$(2.832E-2 m^3/\text{ft}^3) (0.017 \text{ min}/\text{sec}) = 4.8E-4 \frac{m^3 \cdot \text{min}}{\text{ft}^3 \cdot \text{sec}}$$

Sample Enclosure 5.3 provides work space for this calculation.

4.3.3 Determine the potential whole body gamma dose downwind using the gas concentrations calculated in 4.3.2 and the equation,

$$D_{WB} = U_G \cdot \bar{E} \cdot \text{Conc}_{DW} \cdot \text{Time}$$

where,

D_{WB} = whole body gamma dose due to submersion in a cloud of radioactive gas (rem)

$$\begin{aligned}
 U_G &= \text{unit conversion derived from,} \\
 &3.7E4 \text{ (dis/sec-}\mu\text{Ci)}(1\text{cc}/1.2E-3\text{g}) \\
 &(1.602E-6 \text{ erg/MeV}) (\text{g} - \text{rem}/100 \text{ ergs}) \\
 &\cdot 1/2 = 2.5E-1 \frac{\text{dis-rem-cm}^3}{\mu\text{Ci-sec-MeV}} \\
 &(2.5E-1 \frac{\text{dis-rem-cm}^3}{\mu\text{Ci-sec-MeV}})(3600 \frac{\text{sec}}{\text{hr}}) \\
 &= 9.00 E2 \frac{\text{dis-rem-cm}^3}{\mu\text{Ci-hr-MeV}}
 \end{aligned}$$

NOTE: 1/2 is the constant used (in the case of gamma radiation) when assuming that the receptor is exposed to only one-half the cloud owing to the presence of the ground, (Reference 2.4).

Conc_{DW} = downwind concentration ($\mu\text{Ci}/\text{ml}$)

Time = projected duration of exposure (hrs); use
2 hours unless otherwise directed.

\bar{E} = average gamma energy per disintegration (MeV/dis)

NOTE: If \bar{E} cannot be obtained from the sample results, the following values may be used:

<u>Hours from Trip</u>	<u>\bar{E} (MeV/dis)</u>
0-12	0.40
12-48	0.20
48-∞	0.10

4.3.3.1 Record results on Enclosure 3.3.

4.3.4 Determine the potential child thyroid dose downwind using the iodine concentrations calculated in 4.3.2 and the equation,

$$D_{\text{THY}} = U_I \cdot \text{Conc}_{\text{DW}} \cdot \text{Time}$$

where,

D_{THY} = thyroid dose due to uptake of radioactive iodine (rem)

U_I = constants derived from a child's breathing rate
 (1.17E2 cc/sec.), I-131 dose conversion factor
 (4.39 E-3 mrem/pCi), and conversion of pCi to
 μCi (10^6), mrem to rem (10^{-3}), and hrs. to sec
 (3600 secs/hr) = $1.86E6 \frac{\text{cc} \cdot \text{Rem}}{\mu\text{Ci} \cdot \text{hr}}$

Conc_D = downwind concentration of iodine ($\mu\text{Ci/ml}$)

Time = projected exposure time (hrs); use 2 hours
 unless otherwise directed.

- 4.3.4.1 Record results on sample Enclosure 5.3.
- 4.3.4.2 Project the adult thyroid dose by dividing the child dose by two (2).
- 4.3.4.3 Record results of all calculations on Enclosure 5.5 (Dose Assessment Report).
- 4.4 Determine the potentially affected area using the method outlined in Enclosure 5.4.
 - 4.4.1 Record sectors on Enclosure 5.5.
- 4.5 Complete sample Enclosure 5.5 and submit it to the Station Health Physicist. Include any comments and information pertinent to the evaluation of offsite hazards.
- 4.6 Maintain a file of all worksheets and printouts used in dose calculations.
- 5.0 ENCLOSURES
 - 5.1 Sample of Vent Release Data Sheet
 - 5.2 Sample of Table of Two Hour Relative Concentration Factors
 - 5.3 Sample of Manual Calculation Worksheet
 - 5.4 Sample of Evaluation of Plume Location
 - 5.5 Sample of Dose Assessment Report

ENCLOSURE 5.1
HP/O/B/1009/13
VENT RELEASE DATA SHEET

Page 1 of 1

Unit _____ Date/time of Rx trip _____/_____/_____

METEOROLOGICAL DATA

- 1) Lower Tower Wind Speed _____ MPH
- 2) Upper Tower Wind Direction From _____ °
- 3) Temp. Gradient (ΔT) _____ °C
- 4) Vent Flow _____ CFM
- 5) Date/time _____/_____/_____

VENT SAMPLE ANALYSIS

- 1) Total Gas _____ $\mu\text{Ci/ml}$
- 2) I-131 Equiv. _____ $\mu\text{Ci/ml}$
- 3) Gas \bar{E} _____ Mev/dis (Gamma)

VENT MONITOR DATA

- 1) EMF-36L (lo range) _____ CPM
- 2) EMF-36H (hi range) _____ CPM
- 3) $\Delta\text{EMF-37}$ (iodine) _____ CPM; Δt _____ min

CALCULATED DISCHARGE CONCENTRATION

- 1) Gas (Use hi readings if EMF-36H is > 100 CPM)

$$\text{Conc}_{V-\text{low}} = \frac{(\text{EMF } 36\text{L CPM})}{2.70\text{E}7 \frac{\text{CPM-ml}}{\mu\text{Ci}}} = \text{_____ } \mu\text{Ci/ml, or } \text{Conc}_{V-\text{hi}} = \frac{(\text{EMF-36H CPM})}{4.0\text{E}3 \frac{\text{CPM-ml}}{\mu\text{Ci}}} = \text{_____ } \mu\text{Ci/ml}$$

- 2) Iodine

$$\text{Conc}_{V-\text{I}} = \frac{(\Delta\text{EMF-37 CPM})}{\Delta t} \frac{(2.4\text{E-}10 \mu\text{Ci} - \text{min})}{\text{ml} - \text{cpm}} = \text{_____ } \mu\text{Ci/ml}$$

ENCLOSURE 5.2
HP/O/B/1009/13
TWO-HOUR RELATIVE CONCENTRATION FACTORS (CH)

Temperature Difference (°C)	Stability Class	Distance (Miles)										
		.5	1	2	3	4	5	6	7	8	9	10
1) < - .6	A	1.4E-5	1.2E-6	5.9E-7	4.1E-7	3.2E-7	2.5E-7	2.0E-7	1.9E-7	1.8E-7	1.6E-7	1.5E-7
2) -.6 to -.5	B-C	1.5E-4	4.5E-5	1.3E-5	6.3E-6	3.9E-6	2.7E-6	1.9E-6	1.4E-6	1.1E-6	8.3E-7	7.8E-7
3) -0.4 to -0.2	D	3.8E-4	1.4E-4	4.9E-5	2.7E-5	1.7E-5	1.2E-5	9.2E-6	7.3E-6	6.0E-6	5.0E-6	4.3E-6
4) -0.1 to +.4	E	6.9E-4	2.5E-4	9.6E-5	5.5E-5	3.5E-5	2.5E-5	2.0E-5	1.6E-5	1.3E-5	1.1E-5	9.7E-6
5) +.5 to +1.2	F	1.1E-3	5.1E-4	2.0E-4	1.2E-4	8.2E-5	6.3E-5	5.1E-5	4.3E-5	3.8E-5	3.3E-5	3.0E-5
6) > 1.2	G	1.8E-3	1.1E-3	4.3E-4	2.7E-4	2.0E-4	1.7E-4	1.3E-4	1.2E-4	8.6E-5	7.8E-5	7.3E-5

From other sources of meteorological data (Section 4.1) use the wind speed and time of day to determine which row of CH values to use:

Time of Day	Wind Speed	Row #
10:00 A.M. - 4:00 P.M.	N/A	3
4:00 P.M. - 10:00 A.M.	> 15 MPH	4
4:00 P.M. - 10:00 A.M.	≤ 15 MPH	6

ENCLOSURE 5.3
HP/O/B/1009/13
MANUAL CALCULATION WORKSHEET

Page 1 of 1

1) Discharge Concentration (Conc γ):

Gas = _____ $\mu\text{Ci/ml}$

Iodine = _____ $\mu\text{Ci/ml}$

2) Vent Discharge Flow Rate:

FV = _____ CFM _____ MPH

3) Wind Speed

4) Two Hour Relative Conc. factors

$\{CH = \text{sec-mph/m}^3 \quad X/Q = CH/\text{mph} = \text{sec/m}^3$

CH = _____; $X/Q =$ _____ Sec/m^3 @ _____ Mi

CH = _____; $X/Q =$ _____ Sec/m^3 @ _____ Mi

CH = _____; $X/Q =$ _____ Sec/m^3 @ _____ Mi

CH = _____; $X/Q =$ _____ Sec/m^3 @ _____ Mi

5) Downwind Concentrations:

Conc DW = Conc γ o FV o X/Q o (4.8 E-4)

A) Gas:

B) Iodine

Conc DW = _____ $\mu\text{Ci/ml}$ Conc DW = _____ $\mu\text{Ci/ml}$

Conc DW = _____ $\mu\text{Ci/ml}$ Conc DW = _____ $\mu\text{Ci/ml}$

Conc DW = _____ $\mu\text{Ci/ml}$ Conc DW = _____ $\mu\text{Ci/ml}$

Conc DW = _____ $\mu\text{Ci/ml}$ Conc DW = _____ $\mu\text{Ci/ml}$

6) Potential Whole Body Gamma Dose:

DWB = (9.00E2) o Conc DW o \bar{E} o Time

Time = _____ hours

$\bar{E} =$ _____ Mev/dis

DWB = _____ Rem

DWB = _____ Rem

DWB = _____ Rem

DWB = _____ Rem

@ _____ Mi.

@ _____ Mi.

@ _____ Mi.

@ _____ Mi.

7) Potential Child Thyroid Dose:

D THY = (1.86E6) o Conc DW o Time

D THY = _____ Rem

D THY = _____ Rem

D THY = _____ Rem

D THY = _____ Rem

ENCLOSURE 5.4
HP/O/B/1009/13
EVALUATION OF PLUME LOCATION

1. Acquire the following information from Enclosure 5.1 and record on Enclosure 5.5.
 - a) wind direction in degrees from north
 - b) wind speed (mph)
 - c) ΔT ($^{\circ}C$)
 - d) Stability Class
 - e) thyroid and whole body doses

2. Protective action guides submitted to the Station Health Physicist are to be made based on the calculated dose on Enclosure 5.3 and the following information.
 - a) For doses:
 - > 5 Rem Whole Body or,
 - > 25 Rem Thyroid

Recommend Evacuation of Population in Affected Area.
 - B) For doses:
 - 1-5 Rem Whole Body or,
 - 5-25 Rem Thyroid

Recommend evacuation of children and pregnant women, and sheltering of remainder of personnel in the affected area.
 - C) For doses:
 - < 1 Rem Whole Body or,
 - < 5 Rem Thyroid

Recommend no action.

3. Determine the affected zones, based on wind direction and wind speed, with the following tables.

Table 3.1 0-2 Mile Affected Zones

<u>Wind Direction</u>	<u>Affected Zone</u>
0° - 360°	A0

ENCLOSURE 5.4
HP/O/B/1009/13
EVALUATION OF PLUME LOCATION

Table 3.2 2-5 Mile Affected Zones

Wind Speed \leq 5 mph		Wind Speed $>$ 5 mph	
Wind Direction	Affected Zones	Wind Direction	Affected Zones
0° - 360°	A1, B1, C1, D1, E1, F1	0.1° - 22°	C1, D1
		22.1° - 73°	C1, D1, E1
		73.1° - 108°	C1, D1, E1, F1
		108.1° - 120°	D1, E1, F1
		120.1° - 159°	E1, F1
		159.1° - 207°	E1, F1, A1
		207.1° - 247°	F1, A1, B1
		247.1° - 265°	A1, B1
		265.1° - 298°	A1, B1, C1
		298.1° - 338°	B1, C1
		338.1° - 360°	B1, C1, D1

Table 3.3 5-10 Mile Affected Zones

Wind Direction	Affected Zones
0.1° - 27°	C2, D2
27.1° - 69°	C2, D2, E2
69.1° - 95°	D2, E2, F2
95.1° - 132°	D2, E2, F2, F3
132.1° - 144°	E2, F2, F3
144.1° - 160°	E2, F2, F3, A2
160.1° - 201°	F2, F3, A2
201.1° - 229°	F2, F3, A2, B2
229.1° - 249°	F3, A2, B2
249.1° - 259°	A2, A3, B2
259.1° - 290°	A2, A3, B2, C2
290.1° - 304°	A3, B2, C2
304.1° - 333°	B2, C2
333.1° - 360°	B2, C2, D2

4. Record sectors requiring protective action on Sample Enclosure 5.5 along with the recommended protective action.

ENCLOSURE 5.5
DOSE ASSESSMENT REPORT
HP/O/B/1009/13

Duke Power Company Crisis Management Plan Off-Site Dose Report - Catawba

Prepared By _____ Date/Time ____/____/____ Emergency Drill
(Circle One)

Meteorology

Wind Speed _____ MPH
Wind Direction _____ Degrees from North
Vertical Temp. Diff. _____ Degrees C/100ft.
Stability Class (Circle One) _____ A B C D E F E

Source Term	Time	Noble Gas	1-31 ea.
Containment Rad. Monitor	_____	_____ R/hr.	_____ R/hr
Containment Sample	_____	_____ μ Ci/ml	_____ μ Ci/ml
Unit Vent (Sample or EMF)	_____	_____ μ Ci/ml	_____ μ Ci/ml
Curie Release Rate	_____	_____ Ci/sec	_____ Ci/sec
Corresponds to:	_____ LOCA	_____ LOCA through filter	
	_____ Core Damage	_____ Core Damage through filter	
	_____ Tube rupture	_____ Gas Decay Tank	
	_____ New Fuel	_____ Old fuel	_____ Other

Dose Projections

		.5 mi	2 mi	5 mi	10 mi
2 hr Dose (rem) based on Containment release @ _____ ml/hr	Whole Body Child thyroid	_____ _____	_____ _____	_____ _____	_____ _____
2 hr Dose (rem) based on Unit Vent release @ _____ cfm	Whole Body Child thyroid	_____ _____	_____ _____	_____ _____	_____ _____
2 hr Dose (rem) based on Steam release @ _____	Whole Body Child thyroid	_____ _____	_____ _____	_____ _____	_____ _____
2 hr Dose (rem) based on _____ release @ _____	Whole Body Child thyroid	_____ _____	_____ _____	_____ _____	_____ _____

Field Monitoring Data

Location	Distance (mi)	Direction	Dose Rate (mrem/hr)		Contamination (dpm/100 cm ²)
			Whole Body	Child Thyroid	
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Affected Zones (Circle Zones)	0-2 mi A0	2-5 mi A1 B1 C1 D1 E1 F1	5-10 mi A2 B2 C2 D2 E2 F2	9-10 mi A3 F3
-------------------------------	--------------	-----------------------------	------------------------------	------------------

Comments: _____

XC: Data Analysis Coordinator, Station Health Physicist

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

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1009/14
Change(s) 0 to
1 Incorporated

(2) STATION: Catawba

(3) PROCEDURE TITLE: Health Physics Actions Following an Uncontrolled
Release of Liquid Radioactive Material

(4) PREPARED BY: Brian Plumb DATE: 1/30/85

(5) REVIEWED BY: R.D. Kinard DATE: 2-1-85

Cross-Disciplinary Review By: _____ N/R: R. Kinard

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: J. L. Date: 2/4/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
ALARA EVALUATION CHECKLIST

(1) Station Catawba Unit: 1 2 3

Other: Unit 1 and 2

(2) Checklist Applicable to: Procedure HP/O/B/1009/14

(3) ALARA Evaluation

Check those items below which were considered applicable during the preparation and review of this document.

 Flushing and draining were used to minimize source - strength and contamination levels prior to performing an operation.

 Permanent and/or movable shielding was specified for reduction of levels.

 Use of permanent or temporary local exhaust ventilation systems was used for control of airborne contamination.

 Operation was designed to be completed with the least practicable time spent in the radiation field.

 Appropriate tools and equipment were specified for the operation to be performed.

 The operation was designed considering the minimum number of people necessary for safe job completion.

 Remote handling equipment and other special tools were specified to reduce external dose.

 Contamination - control techniques were specified.

 The operation was designed to be conducted in areas of as low an exposure as practicable.

 Additional ALARA considerations were:

✓ ALARA Principles were not considered since the procedure did not involve work in a radiation area.

(5) Prepared by: R. D. Kenna Date 1/30/85

(6) Reviewed by: R. D. Kenna Date 2-1-85

DUKE POWER COMPANY
NUCLEAR SAFETY EVALUATION CHECK LIST

- (1) STATION: Catawba UNIT: 1 2 3
OTHER: Unit 1 and 2
(2) CHECK LIST APPLICABLE TO: Procedure HP/O/B/1009/14

(3) SAFETY EVALUATION - PART A

The item to which this evaluation is applicable represents:

Yes No X A change to the station or procedures as described in the FSAR;
or a test or experiment not described in the FSAR?

If the answer to the above is "Yes", attach a detailed description of the item being evaluated and an identification of the affected section(s) of the FSAR.

(4) SAFETY EVALUATION - PART B

Yes No X Will this item require a change to the station Technical Specifications?

If the answer to the above is "Yes," identify the specification(s) affected and/or attach the applicable pages(s) with the change(s) indicated.

(5) SAFETY EVALUATION - PART C

As a result of the item to which this evaluation is applicable:

- Yes No X Will the probability of an accident previously evaluated in the FSAR be increased?
Yes No X Will the consequences of an accident previously evaluated in the FSAR be increased?
Yes No X May the possibility of an accident which is different than any already evaluated in the FSAR be created?
Yes No X Will the probability of a malfunction of equipment important to safety previously evaluated in the FSAR be increased?
Yes No X Will the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR be increased?
Yes No X May the possibility of malfunction of equipment important to safety different than any already evaluated in the FSAR be created?
Yes No X Will the margin of safety as defined in the bases to any Technical Specification be reduced?

If the answer to any of the preceding is "Yes", an unreviewed safety question is involved. Justify the conclusion that an unreviewed safety question is or is not involved. Attach additional pages as necessary.

(6) PREPARED BY: Brian Chondrulis DATE: 1/30/85

(7) REVIEWED BY: R. L. Kinn DATE: 2-1-85

DUKE POWER COMPANY
NUCLEAR SAFETY EVALUATION

Applicable to: Procedure HP/O/B/1009/14

As this revision only involves a correction of a typographical error and a change of the term "boxcar" to the more common term contamination, it will not require a change to the FSAR or the Technical Specifications and will not involve an unreviewed safety question.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HEALTH PHYSICS ACTIONS FOLLOWING AN
UNCONTROLLED RELEASE OF LIQUID RADIOACTIVE MATERIAL

1.0 PURPOSE

This procedure describes the methods to be used for calculating the radio-nuclide concentration at area water intakes following an uncontrolled release of liquid radioactive material, and the subsequent actions to be taken when the concentration exceeds Technical Specifications.

2.0 REFERENCES

- 2.1 HP/O/B/1009/04, Environmental Monitoring for Emergency Conditions Within the Ten Mile Radius of Catawba Nuclear Station
- 2.2 Control Room Unit Data Book
- 2.3 10CFR20, Appendix B, Table II, Column 2
- 2.4 CNS FSAR Sections 2, 11, 12 and 15
- 2.5 CNS Technical Specifications Sections 3/4.3, 3/4.11 and 5.0
- 2.6 Letter To Master File CN-1227.00 Dilution Factor - Rock Hill Intake from Design Engineering dated February 23, 1983
- 2.7 CNS Emergency Plan

3.0 LIMITS AND PRECAUTIONS

- 3.1 The full implementation of this procedure should be used in emergency situations that could result in the contamination and possible shutdown of area water supply intakes.
- 3.2 Full implementation of the protective actions in this procedure require station management authorization.
- 3.3 This procedure is for use under abnormal conditions and results in conservative recommendations. Care must be exercised to ensure only appropriate actions are taken.
- 3.4 Conservatism exists in the calculations utilized in this procedure and includes, but is not limited to:
 - 3.4.1 Decay
 - 3.4.2 Dilution factor
- 3.5 Transit time from CNS to the nearest municipal water intake is reduced from three days to one-half day under extreme meteorological conditions (Ref CNS FSAR 2.4.12).

- 3.6 Reporting requirements of Station Directive 2.8.1 and HP/O/B/1009/02 shall be evaluated to ensure that the Shift Supervisor and/or the Licensing Engineer are informed of the requirements.

4.0 PROCEDURE

- 4.1 Health Physics will determine concentration of effluent released from site boundary by the following method(s):
- 4.1.1 Determine effluent concentration from EMF-49 if possible. Concentration may be determined from analysis of sample drawn directly from EMF sample tap, if necessary.
- NOTE: Conversion graph for EMF data from CPN to uCi/ml located in Control Room Unit Data Book.
- 4.1.2 Determine effluent concentration from volume and activity if release is made from other than through Waste Liquid System, if possible.
- 4.1.3 Collect representative sample from Environmental Sampling Pier (Location Site #A0 1 46) at Station Service Water Discharge Canal and analyze sample for concentration.
- 4.1.4 Should utilize most restrictive (highest) concentration from applicable procedure Steps 4.1.1, 4.1.2, 4.1.3 above.
- 4.2 Determine the potential for contamination of area water supplies using Enclosure 5.1 (Transit Time/Radionuclide Concentration Calculations) and sampling data from Health Physics.
- 4.3 If data indicates that a release made through the Station Service Water Discharge Canal to Lake Wylie will exceed 10CFR20, Appendix B, Table II, Column 2 limits at affected area water intakes, Health Physics shall recommend the following to the Emergency Coordinator:
- 4.3.1 Request minimum flow at Lake Wylie Hydro Station from System Load Dispatcher (to extend transit time).
- NOTE: Transit time to Rock Hill water intake is approximately 14 days with NO FLOW through Lake Wylie Dam, (based on dam leakage rate).
- 4.3.2 Request Field Monitoring Teams (FMT) to track the release by sampling and evaluation of sample concentrations taken from discharge point at Environmental Sampling Pier (Location Site # A0 1 46), above Lake Wylie Dam (Location Site # B1 4 5), directly below Lake Wylie Dam (Location Site # B1 4 6), and at Rock Hill municipal water intake structure (Location Site #C2 7 8), per Ref. 2.1, as deemed necessary.
- NOTE: Transit time is calculated as three days under normal meteorological conditions with all units in operation at Lake Wylie Hydro Station.

4.3.3 Notify (through the State) the area water supply pumping stations that a release of radioactive materials to Lake Wylie has occurred and that limited protective actions (sampling and analysis) are being taken.

4.3.3.1 In the event the sampling confirms the contamination levels at area water intakes will exceed 10CFR20, Appendix B, Table II, Column 2 limits, request (through the state) that area water pumping stations cease operations during the period of time contaminated water is passing the pumping station intakes.

4.3.4 Request System Load Dispatcher regulate flow through dam as required.

NOTE: Maximum flow through dam will allow contamination to pass critical areas in least time.

4.4 Discontinue environmental surveillance efforts when concentration (contamination levels) indicate that protective actions are no longer appropriate.

5.0 ENCLOSURES

5.1 Transit Time/Radionuclide Concentration Calculation

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/14
SAMPLE ENCLOSURE 5.1
TRANSIT TIME/RADIONUCLIDE CONCENTRATION CALCULATION

Page 1 of 2

DESCRIPTION

Transit time(s) and radionuclide concentration(s) for an uncontrolled release of liquid radioactive materials from a Catawba Nuclear Station release point to the municipal (or industrial) water intake structures of Rock Hill, Celanese Fibers Company (Rock Hill), Fort Mill and Springs Mills, Inc. (Fort Mill).

NOTE #1: All municipal or industrial water intake concentration calculations are based on Rock Hill water intake sampling point unless specified otherwise by Station Health Physicist or Emergency Coordinator.

CNS Discharge Point	Formula Test Criteria	Water Intake	Transit Time (NOTE #2)	Dilution Factor ($\frac{1}{\text{ft}^3}$)	Formula Required
via WL System (dischg header)	Conc and Vol known	Rock Hill	3 days	4×10^{-9}	#1
other than WL System	Conc and Vol known	Rock Hill	3 days	4×10^{-9}	#2
via WL System (dischg header)	Conc and Vol unknown	Rock Hill	3 days	4×10^{-9}	#3
other than WL System	Conc and Vol unknown	Rock Hill	3 days	4×10^{-9}	#3

NOTE #2: Transit time assumes all units in operation at Lake Wylie Hydro Station.

FORMULAS:

$$\begin{aligned} \#1 - C_w &= C_o \times D \times \{ \text{time} (RR_e + RR_d) \} \times \frac{RR_e}{RR_d} \\ \#2 - C_w &= C_o \times D \times V_k \\ \#3 - C_w &= C_o \times D \times V_c \text{ (see NOTE #3)} \end{aligned}$$

Where: C_w = Radionuclide concentration at municipal water intake (uCi/ml)

C_o = Undiluted discharge point concentration (uCi/ml)

D = dilution factor ($4 \times 10^{-9} \frac{1}{\text{ft}^3}$)

time = taken from WL Release Worksheet (sec) - (time WMT pump is running)

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/14

Page 2 of 2

SAMPLE ENCLOSURE 5.1
TRANSIT TIME/RADIONUCLIDE CONCENTRATION CALCULATION

RR_e = effluent release rate (cfs) - (from WL Release Worksheet)

RR_d = RL (and RN) flow rate(s) (cfs)

$\frac{RR_e}{RR_d}$ = dilution variable (no units)

RR_d

V_k = known volume (ft^3)

V_c = 13,268,000 ft^3 (discharge canal volume)

Conversion Factors: cfs = (2.22×10^{-3}) cfs/gpm (Xgpm)

ft^3 = gal/7.481

NOTE #3: When using formula #3, must assume entire contents of discharge canal as effluent release and evaluated sample concentration as C_o (Undiluted effluent concentration).

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: DP/0/3/1002-13
Change(s) 0 to
1 Incorporated

- (2) STATION: Catawba
- (3) PROCEDURE TITLE: Uncontrolled Release of Gaseous Radioactive Material
Other Than Through the Unit Vent

- (4) PREPARED BY: Brian Churchill DATE: 1/30/85
- (5) REVIEWED BY: R. D. Kinard DATE: 2-1-85

Cross-Disciplinary Review By: _____ N/R: R. Kinard

- (6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

- (7) APPROVED BY: J. W. G. Date: 2/4/85

- (8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
OFFSITE DOSE PROJECTIONS
UNCONTROLLED RELEASE OF GASEOUS RADIOACTIVE MATERIAL
OTHER THAN THROUGH THE UNIT VENT

1.0 PURPOSE

To describe an approved method for projecting dose commitment from a noble gas or iodine release, other than a unit vent release, during an emergency.

2.0 REFERENCES

- 2.1 HP/O/B/1009/06, Alternative Method for Determining Dose Rate Within the Reactor Building
- 2.2 Variables used in HP/O/B/1009/15, Letter File Number CN.: 134.10
- 2.3 Reg Guide 1.4
- 2.4 Reg Guide 1.109

3.0 LIMITS AND PRECAUTIONS

- 3.1 It is assumed that the whole body dose from a release is very small compared to the iodine thyroid dose. Thus, iodine whole body dose is not considered here.
- 3.2 This procedure applies to releases made from Catawba Nuclear Station only. Many of the values contained in this procedure are site specific.
- 3.3 This procedure considers all releases to the ground level releases.
- 3.4 Reporting requirements of Station Directive 2.8.1 and HP/O/B/1009/02 shall be evaluated to ensure that the Shift Supervisor and/or Licensing Engineer are informed of the requirements.

4.0 PROCEDURE

- 4.1 Acquire the following information and record on sample Enclosure 5.1.

NOTE: Should site meteorological data be unavailable, obtain wind speed and wind direction from the National Weather Service (United States Government - National Oceanic & Atmospheric Administration).

NOTE: If appropriate, obtain advance meteorological data to calculate doses due to changing meteorological conditions.

- 4.1.1 Reactor Unit, date and time of reactor trip.
- 4.1.2 Lower tower wind speed (mph).
- 4.1.3 Tower wind direction in degrees from North (North = 0°).
- 4.1.4 Temperature gradient ($\Delta T^{\circ}\text{C}$).
- 4.1.5 Radiation Monitor (EMF 53A or 53B) reading (R/hr) or calculated per Reference 2.1.
- 4.1.6 Date and time of calculations.
- 4.2 Determine the Containment Building leakage rate (LR) and record it on sample Enclosure 5.1.
 - 4.2.1 LR (ml/hr) is the total leak rate for the containment which is one of the following:
 - 4.2.1.1 a "best guess" assumption.
 - 4.2.1.2 the measured leak rate where suitable means are available;
 - 4.2.1.3 The design leakage rate (LR_{DLR}) which is determined by:

$$LR_{DLR} = \text{Containment Volume} \cdot \text{Design Leak Constant}$$

$$= 2.83 \times 10^{10} \text{ ml} \cdot \frac{0.0025}{\text{day}} \cdot \frac{\text{day}}{24 \text{ hr}}$$

$$2.95 \times 10^6 \text{ ml/hr}$$
- 4.3 Determine the X/Q values for each point of interest downwind and record on sample Enclosure 5.1.

If no points have been requested, use the .5, 2, 5 and 10 mile values.

 - 4.3.1 Locate the relative two-hour downwind concentration value (CH) for each point from sample Enclosure 5.2 and record onto sample Enclosure 5.1.
 - 4.3.2 Convert these values to X/Q by,

$$X/Q = \frac{CH \text{ (MPH-Sec/m}^3\text{)}}{\text{Tower Wind Speed (MPH)}}$$
- 4.4 Determine the potential whole body dose from submersion in a cloud of noble gas and record on sample Enclosure 5.1.
 - 4.4.1 Calculate the whole body two (2) hour dose commitment,

$$D_{WB} = DR_M \cdot ADC \cdot LR \cdot X/Q \cdot U_{NG}$$

Where,

D_{WB} = Whole body two (2) hour dose commitment (rem)

DR_M = Monitor dose rate (R/hr)

ADC = Average Decay constant for noble gases =

$$2.2622E-2 \frac{\mu\text{Ci} \cdot \text{MeV} \cdot \text{hr}^2}{\text{ml} \cdot \text{d} \cdot \text{R}}$$

LR = Containment leakage rate in ml/hr

X/Q = dispersion factor in sec/m³

$$U_{NG} = \frac{(3.7E4 \text{ d/sec} \cdot \mu\text{Ci}) (1.6E-6 \text{ ergs/MeV})}{2 (100 \text{ ergs/g-rad}) (1.2E-3 \text{ g/cm}^3) (1E6 \text{ cm}^3/\text{m}^3)}$$

$$= 2.5E-7 \frac{\text{rad} \cdot \text{m}^3 \cdot \text{d}}{\text{sec} \cdot \mu\text{Ci} \cdot \text{MeV}}$$

$$5.7E-9 \frac{\text{hr}^2 \cdot \text{m}^3 \cdot \text{rad}}{\text{ml} \cdot \text{R} \cdot \text{sec}} = \text{ADC} \cdot U_{NG}$$

4.5 Determine the potential thyroid dose from uptake of radioiodine and record on sample Enclosure 5.1.

4.5.1 Locate the time plus one (1) hour after trip on Enclosure 5.3 and record the corresponding Decay Constant on Enclosure 5.1.

4.5.2 Calculate a child's thyroid two (2) hour dose commitment using time plus one (1) hour,

$$D_T = DR_M \cdot DC \cdot LR \cdot X/Q \cdot U_I$$

Where,

D_T = thyroid two (2) hour dose commitment (rem)

DR_M = monitor dose rate (R/hr)

DC = Decay Constant in $\frac{\mu\text{Ci} \cdot \text{mrem} \cdot \text{hr}^2}{\text{ml} \cdot \mu\text{Ci} \cdot \text{R}}$ for time plus one (1) hour (see sample Enclosure 5.3)

LR = Leak rate in ml/hr

X/Q dispersion in sec/m³

U_I = breathing rate for child times μCi to μCi conversion factor

$$(1.17E-4 \text{ m}^3/\text{sec}) \cdot 1E3 \frac{\mu\text{Ci-rem}}{\mu\text{Ci-mrem}} = 1.17E-1 \frac{\text{m}^3 \cdot \mu\text{Ci-rem}}{\text{Sec} \cdot \mu\text{Ci-mrem}}$$

- 4.6 Determine the potentially affected area using Enclosure 5.4. Record the affected zones on Enclosure 5.5.
- 4.7 Complete sample Enclosure 5.5 and submit it to the Data Analysis Coordinator. Include any comments pertinent to the evaluation of offsite hazards.

5.0 ENCLOSURES

- 5.1 Sample Projected Offsite Dose Released From Containment
- 5.2 Sample Table of Two Hour Relative Concentration Factors (C_H)
- 5.3 Sample Table of Iodine and Noble Decay Constant (DC)
- 5.4 Sample of Evaluation of Plume Location
- 5.5 Sample Dose Assessment Report
- 5.6 Estimation of Containment Leak Rate

ENCLOSURE 5.1
HP/O/B/1009/15
PROJECTED OFFSITE DOSE RELEASED FROM CONTAINMENT

Unit _____ Date/Time of Reactor Trip _____ / _____

METEOROLOGICAL DATA

1. Lower Tower wind speed _____ mph
2. Upper Tower wind direction _____ °
3. Temperature gradient (ΔT) _____ °C

MONITOR DATA

1. EMF 53A or 53B/Survey Inst. # _____, $DR_M =$ _____ R/hr
(Circle One)

NOTE: If containment monitor information is not useable, refer to Reference 2.1.

DOSE CALCULATION

DATE/TIME _____

1. LR _____ ml/hr
2. C_H @ _____ mi. = _____, $X/Q =$ _____ sec/m³
 C_H @ _____ mi. = _____, $X/Q =$ _____ sec/m³
 C_H @ _____ mi. = _____, $X/Q =$ _____ sec/m³
 C_H @ _____ mi. = _____, $X/Q =$ _____ sec/m³

A. Whole Body 2 hr. dose projection from noble gases:

$$\text{by } D_{WB} = DR_M \cdot LR \cdot X/Q \cdot 5.7E-9,$$

Miles Out

D_{WB} - 2 hr Dose Commitment (rem)

ENCLOSURE 5.1
HP/O/B/1009/15
PROJECTED OFFSITE DOSE RELEASED FROM CONTAINMENT

B. Thyroid 2 hr. dose projection from iodine:

DC _____,

by $D_T = DR_M \cdot DC \cdot LR \cdot X/Q \cdot (1.17E-1)$,

Miles Out

D_T 2 hr Dose Commitment (rem)

DEFINITIONS

D_{WB} = whole body 2 hour dose commitment from noble gases (rem)
 D_T = thyroid 2 hr dose commitment from iodine (rem)
 LR = containment leakage rate (ml/hr)
 X/Q = "Chi over Q" is downwind concentration correction factor (sec/m³)
 C_H = 2 hr relative downwind concentration ($X/Q \cdot MPH$)
 DC = Decay constant from Enclosure 5.3
 DR_M = dose rate at the containment monitor (R/hr)

ENCLOSURE 5.2
HP/O/B/1009/15
TWO-HOUR RELATIVE CONCENTRATION FACTORS (C)
H

Temperature Difference (°C)	Stability Class	Distance (Miles)										
		.5	1	2	3	4	5	6	7	8	9	10
1) < -1.6	A	1.4E-5	1.2E-6	5.9E-7	4.1E-7	3.2E-7	2.5E-7	2.0E-7	1.9E-7	1.8E-7	1.6E-7	1.5E-7
2) -1.6 to -0.5	B-C	1.5E-4	4.5E-5	1.3E-5	6.1E-6	3.9E-6	2.7E-6	1.9E-6	1.4E-6	1.1E-6	8.3E-7	7.8E-7
3) -0.4 to -0.2	D	3.8E-4	1.4E-4	4.9E-5	2.7E-5	1.7E-5	1.2E-5	9.2E-6	7.3E-6	6.0E-6	5.0E-6	4.3E-6
4) -0.1 to 0.4	E	6.9E-4	2.5E-4	9.6E-5	5.5E-5	3.5E-5	2.5E-5	2.0E-5	1.6E-5	1.3E-5	1.1E-5	9.7E-6
5) 0.5 to 0.9	F	1.1E-3	5.1E-4	2.0E-4	1.2E-4	8.2E-5	6.3E-5	5.1E-5	4.3E-5	3.8E-5	3.3E-5	3.0E-5
6) > 1.2	G	1.8E-3	1.1E-3	4.3E-4	2.7E-4	2.0E-4	1.7E-4	1.3E-4	1.2E-4	8.6E-5	7.8E-5	7.3E-5

From other sources of meteorological data (Section 4.1) use the wind speed and time of day to determine which row of C values to use:

Time of Day	Wind Speed	Row #
10:00 A.M. - 4:00 P.M.	N/A	3
4:00 P.M. - 10:00 A.M.	> 15 MPH	4
4:00 P.M. - 10:00 A.M.	≤ 15 MPH	6

ENCLOSURE 5.3

PAGE 1 OF 1

TABLE

IODINE & NOBLE DECAY CONSTANT (DC)

0 - 498 HRS

HP/O/E/1009/15

HOUR	DC	HOUR	DC	HOUR	DC	HOUR	DC	HOUR	DC
0	3.0649E-05	100	5.6125E-04	200	6.8707E-04	300	7.4438E-04	400	7.9189E-04
2	5.7902E-05	102	5.6595E-04	202	6.8925E-04	302	7.4537E-04	402	7.9197E-04
4	8.1506E-05	104	5.7050E-04	204	6.9060E-04	304	7.4636E-04	404	7.9205E-04
6	1.0296E-04	106	5.7492E-04	206	6.9194E-04	306	7.4735E-04	406	7.9213E-04
8	1.2295E-04	108	5.7920E-04	208	6.9326E-04	308	7.4833E-04	408	7.9220E-04
10	1.4170E-04	110	5.8335E-04	210	6.9457E-04	310	7.4932E-04	410	7.9228E-04
12	1.5923E-04	112	5.8737E-04	212	6.9586E-04	312	7.5029E-04	412	7.9235E-04
14	1.7591E-04	114	5.9127E-04	214	6.9714E-04	314	7.5127E-04	414	7.9242E-04
16	1.9159E-04	116	5.9504E-04	216	6.9840E-04	316	7.5224E-04	416	7.9249E-04
18	2.0648E-04	118	5.9870E-04	218	6.9965E-04	318	7.5321E-04	418	7.9256E-04
20	2.2071E-04	120	6.0225E-04	220	7.0089E-04	320	7.5418E-04	420	7.9263E-04
22	2.3439E-04	122	6.0569E-04	222	7.0212E-04	322	7.5515E-04	422	7.9270E-04
24	2.4757E-04	124	6.0903E-04	224	7.0333E-04	324	7.5611E-04	424	7.9277E-04
26	2.6034E-04	126	6.1226E-04	226	7.0454E-04	326	7.5707E-04	426	7.9284E-04
28	2.7272E-04	128	6.1540E-04	228	7.0574E-04	328	7.5803E-04	428	7.9291E-04
30	2.8475E-04	130	6.1844E-04	230	7.0692E-04	330	7.5899E-04	430	7.9298E-04
32	2.9645E-04	132	6.2140E-04	232	7.0810E-04	332	7.5994E-04	432	7.9305E-04
34	3.0784E-04	134	6.2426E-04	234	7.0926E-04	334	7.6089E-04	434	7.9312E-04
36	3.1893E-04	136	6.2705E-04	236	7.1042E-04	336	7.6184E-04	436	7.9319E-04
38	3.2975E-04	138	6.2975E-04	238	7.1157E-04	338	7.6279E-04	438	7.9326E-04
40	3.4029E-04	140	6.3238E-04	240	7.1272E-04	340	7.6373E-04	440	7.9333E-04
42	3.5058E-04	142	6.3493E-04	242	7.1385E-04	342	7.6467E-04	442	7.9340E-04
44	3.6062E-04	144	6.3741E-04	244	7.1498E-04	344	7.6561E-04	444	7.9347E-04
46	3.7041E-04	146	6.3983E-04	246	7.1610E-04	346	7.6655E-04	446	7.9354E-04
48	3.7999E-04	148	6.4218E-04	248	7.1721E-04	348	7.6748E-04	448	7.9361E-04
50	3.8933E-04	150	6.4447E-04	250	7.1832E-04	350	7.6842E-04	450	7.9368E-04
52	3.9846E-04	152	6.4670E-04	252	7.1942E-04	352	7.6935E-04	452	7.9375E-04
54	4.0738E-04	154	6.4887E-04	254	7.2051E-04	354	7.7028E-04	454	7.9382E-04
56	4.1609E-04	156	6.5099E-04	256	7.2160E-04	356	7.7120E-04	456	7.9389E-04
58	4.2460E-04	158	6.5306E-04	258	7.2268E-04	358	7.7213E-04	458	7.9396E-04
60	4.3291E-04	160	6.5508E-04	260	7.2376E-04	360	7.7305E-04	460	7.9403E-04
62	4.4103E-04	162	6.5705E-04	262	7.2483E-04	362	7.7397E-04	462	7.9410E-04
64	4.4896E-04	164	6.5897E-04	264	7.2590E-04	364	7.7489E-04	464	7.9417E-04
66	4.5669E-04	166	6.6085E-04	266	7.2696E-04	366	7.7581E-04	466	7.9424E-04
68	4.6425E-04	168	6.6269E-04	268	7.2802E-04	368	7.7672E-04	468	7.9431E-04
70	4.7161E-04	170	6.6450E-04	270	7.2907E-04	370	7.7763E-04	470	7.9438E-04
72	4.7879E-04	172	6.6626E-04	272	7.3012E-04	372	7.7854E-04	472	7.9445E-04
74	4.8579E-04	174	6.6799E-04	274	7.3116E-04	374	7.7945E-04	474	7.9452E-04
76	4.9262E-04	176	6.6969E-04	276	7.3220E-04	376	7.8036E-04	476	7.9459E-04
78	4.9926E-04	178	6.7135E-04	278	7.3323E-04	378	7.8126E-04	478	7.9466E-04
80	5.0573E-04	180	6.7298E-04	280	7.3427E-04	380	7.8217E-04	480	7.9473E-04
82	5.1202E-04	182	6.7458E-04	282	7.3529E-04	382	7.8307E-04	482	7.9480E-04
84	5.1815E-04	184	6.7615E-04	284	7.3632E-04	384	7.8397E-04	484	7.9487E-04
86	5.2410E-04	186	6.7770E-04	286	7.3734E-04	386	7.8486E-04	486	7.9494E-04
88	5.2989E-04	188	6.7922E-04	288	7.3835E-04	388	7.8576E-04	488	7.9501E-04
90	5.3551E-04	190	6.8072E-04	290	7.3936E-04	390	7.8665E-04	490	7.9508E-04
92	5.4097E-04	192	6.8219E-04	292	7.4037E-04	392	7.8754E-04	492	7.9515E-04
94	5.4627E-04	194	6.8364E-04	294	7.4138E-04	394	7.8843E-04	494	7.9522E-04
96	5.5142E-04	196	6.8507E-04	296	7.4238E-04	396	7.8932E-04	496	7.9529E-04
98	5.5641E-04	198	6.8648E-04	298	7.4338E-04	398	7.9020E-04	498	7.9536E-04

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
ENCLOSURE 5.4
HP/O/B/1009/15
EVALUATION OF PLUME LOCATION

5.4.1. Acquire the following information from sample Enclosure 5.1 and record on sample Enclosure 5.5.

5.4.1.1 Wind direction in degrees from North

5.4.1.2 Wind speed (mph)

5.4.1.3 ΔT ($^{\circ}\text{C}$)

5.4.1.4 Stability class

5.4.1.5 Thyroid and whole body dose

5.4.2. Determine the affected zones, based on wind direction and wind speed, with the following tables:

Table 3.1 0-2 Mile Affected Zones

<u>Wind Direction</u>	<u>Affected Zones</u>
0 $^{\circ}$ - 360 $^{\circ}$	A0

Table 3.2 2-5 Mile Affected Zones

Wind Speed \leq 5 mph

<u>Wind Direction</u>	<u>Affected Zones</u>	<u>Wind Direction</u>	<u>Affected Zones</u>
0 $^{\circ}$ - 360 $^{\circ}$	A1, B1, C1, D1, E1, F1	0.1 $^{\circ}$ - 22 $^{\circ}$	C1, D1
		22.1 $^{\circ}$ - 73 $^{\circ}$	C1, D1, E1
		73.1 $^{\circ}$ - 108 $^{\circ}$	C1, D1, E1, F1
		108.1 $^{\circ}$ - 120 $^{\circ}$	D1, E1, F1
		120.1 $^{\circ}$ - 159 $^{\circ}$	E1, F1
		159.1 $^{\circ}$ - 207 $^{\circ}$	E1, F1, A1
		207.1 $^{\circ}$ - 247 $^{\circ}$	F1, A1, B1
		247.1 $^{\circ}$ - 265 $^{\circ}$	A1, B1
		265.1 $^{\circ}$ - 298 $^{\circ}$	A1, B1, C1
		298.1 $^{\circ}$ - 338 $^{\circ}$	B1, C1
		338.1 $^{\circ}$ - 360 $^{\circ}$	B1, C1, D1

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 ENCLOSURE 5.4
 HP/O/B/1009/15
 EVALUATION OF PLUME LOCATION

Table 3.3 5-10 Mile Affected Zones

<u>Wind Direction</u>	<u>Affected Zones</u>
0.1° - 27°	C2, D2
27.1° - 69°	C2, D2, E2
69.1° - 95°	D2, E2, F2
95.1° - 132°	D2, E2, F2, F3
132.1° - 144°	E2, F2, F3
144.1° - 160°	E2, F2, F3, A2
160.1° - 201°	F2, F3, A2
201.1° - 229°	F2, F3, A2, B2
229.1° - 249°	F3, A2, B2
249.1° - 259°	A2, A3, B2
259.1° - 290°	A2, A3, B2, C2
290.1° - 304°	A3, B2, C2
304.1° - 333°	B2, C2
333.1° - 360°	B2, C2, D2

5.4.3 Determine the protective action guides (PAG), based on the calculated dose(s) on Sample Enclosure 5.1 and the following information:

5.4.3.1 For doses:

< 1 Rem Whole Body or,

< 5 Rem Thyroid

Recommend no action.

5.4.3.2 For doses:

1-5 Rem Whole Body or,

5-25 Rem Thyroid

Recommend evacuation of children and pregnant women and sheltering of remainder of personnel in the affected area.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
ENCLOSURE 5.4
HP/O/B/1009/15
EVALUATION OF PLUME LOCATION

5.4.3.3 For doses:

> 5 Rem Whole Body or,

> 25 Rem Thyroid

Recommend Evacuation of Population in Affected Area.

5.4.4. Record only the affected zones requiring protective action on sample
Enclosure 5.5 along with the recommended protective action.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
HP/O/B/1009/15
ENCLOSURE 5.5
DOSE ASSESSMENT REPORT

Page 1 of 1

Duke Power Crisis Company Management Plan Off-Site Dose Report - CATAWBA

Prepared By _____ Date/Time _____/_____
Emergency Drill
(circle one)

Meteorology
Wind Speed _____ MPH
Wind Direction _____ degrees from North
Vertical Temp. Diff. _____ degrees C/100 ft.
Stability Class (circle one) A B C D E F G

Source Term	Time	Noble Gas	I-131 equivalent
Containment Rad. Monitor	_____	_____ R/hr	_____ R/hr
Containment Sample	_____	_____ uCi/ml	_____ uCi/ml
Unit Vent (Sample of EMF)	_____	_____ uCi/ml	_____ uCi/ml
Curie Release Rate	_____	_____ Ci/sec	_____ Ci/sec
Corresponds to:	LOCA	LOCA through filter	
	Core damage	Core damage through filter	
	Tube rupture	Gas Decay Tank	
	New fuel	Old fuel	Other _____

Dose Projections

		.5 mi	2 mi	5 mi	10 mi
2hr Dose(rem) based	Whole Body	_____	_____	_____	_____
on Containment release	Child thyroid	_____	_____	_____	_____
@ _____ ml/hr					
2hr Dose(rem) based	Whole Body	_____	_____	_____	_____
on Unit Vent release	Child thyroid	_____	_____	_____	_____
@ _____ cfm					
2hr Dose(rem) based	Whole Body	_____	_____	_____	_____
on Steam release	Child thyroid	_____	_____	_____	_____
2hr Dose(rem) based	Whole Body	_____	_____	_____	_____
on _____ release	Child thyroid	_____	_____	_____	_____
@ _____					

Field Monitoring Data

Location	Distance (mi)	Direction	Dose Rate (mrem/hr)		Contamination (dpm/100 cm ²)
			Whole body	Child thyroid	
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Affected Zones (circle zones)	0-2 mi A0	2-5 mi A1 B1 C1 D1 E1 F1	5-10 mi A2 B2 C2 D2 E2 F2	9-10 mi A3 F3
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COMMENTS: _____

xc: Data Analysis Coordinator, Station Health Physicist

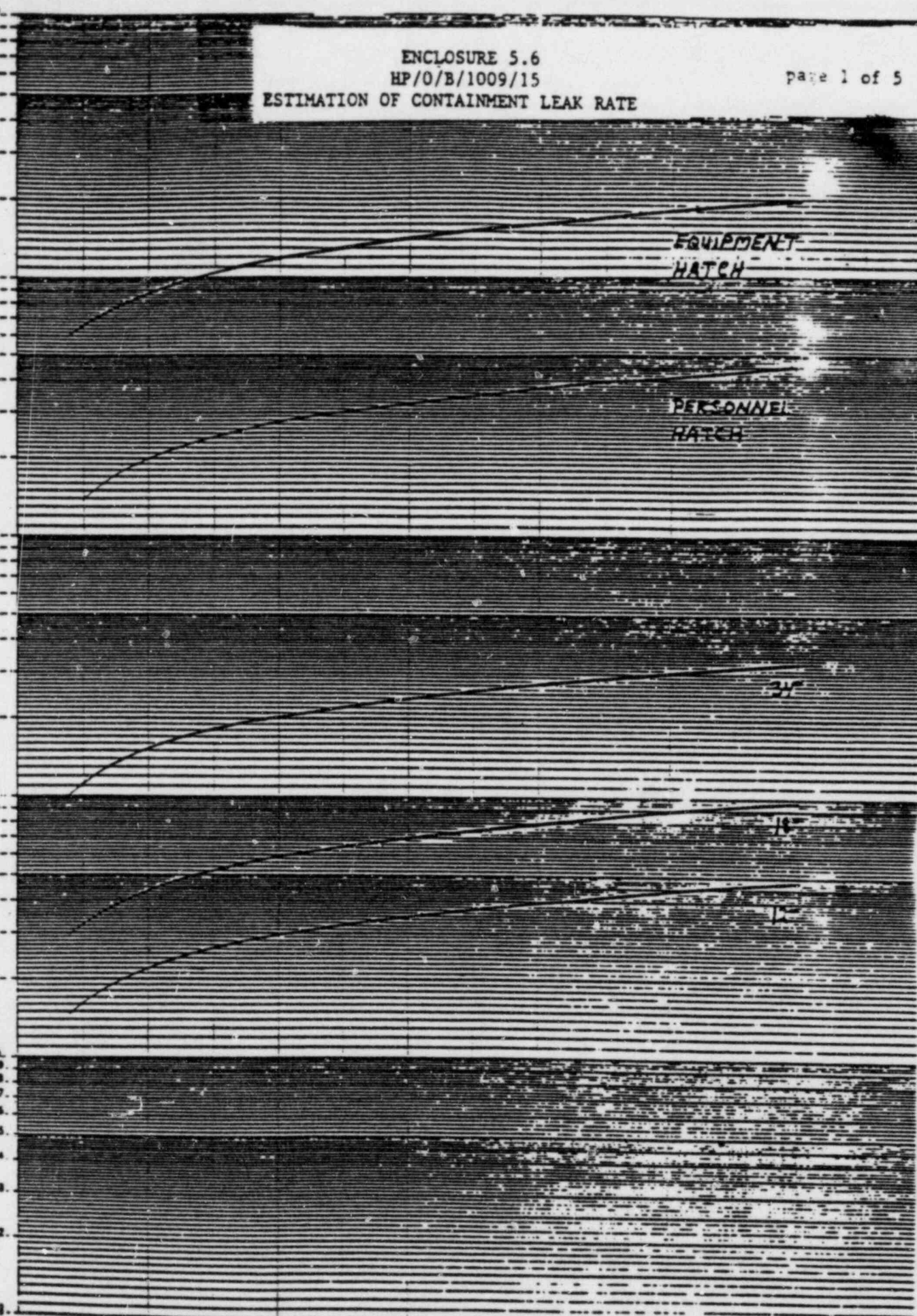
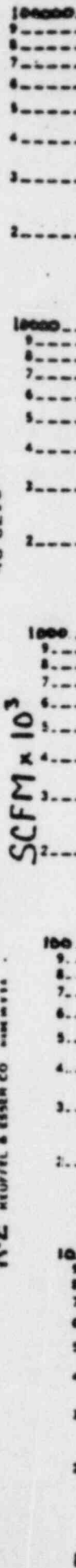
ENCLOSURE 5.6
HP/O/B/1009/15
ESTIMATION OF CONTAINMENT LEAK RATE

page 1 of 5

46 6210

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
NEUFEL & ESSER CO. MADE IN U.S.A.

SCFM $\times 10^3$

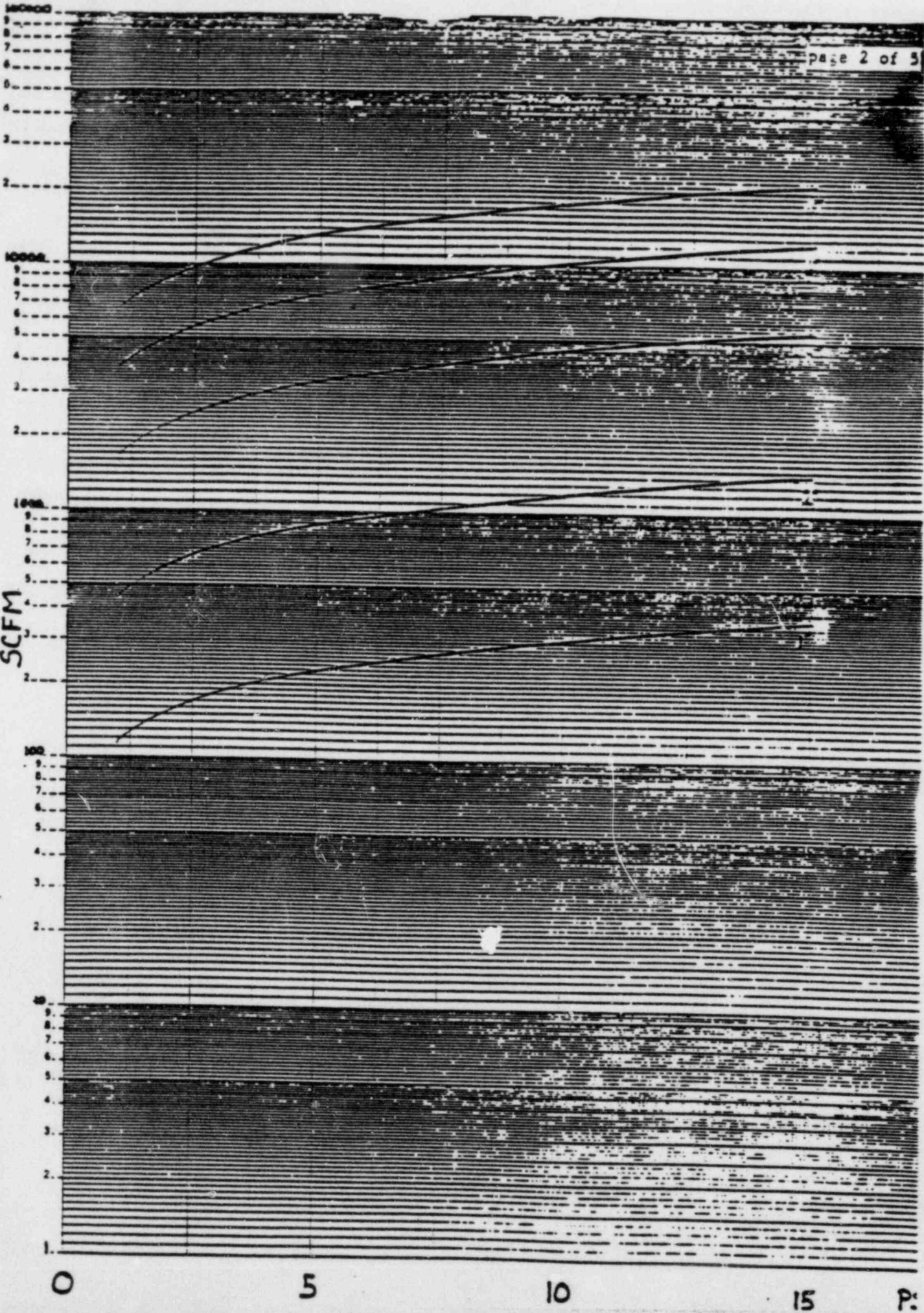


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K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
HEUFFEL & ESSEN CO. MADE IN U.S.A.

SCFM



46 7520

K-E LOGARITHMIC 3+3 CYCLES
REVISED 9/13/88 CO. 1000000000

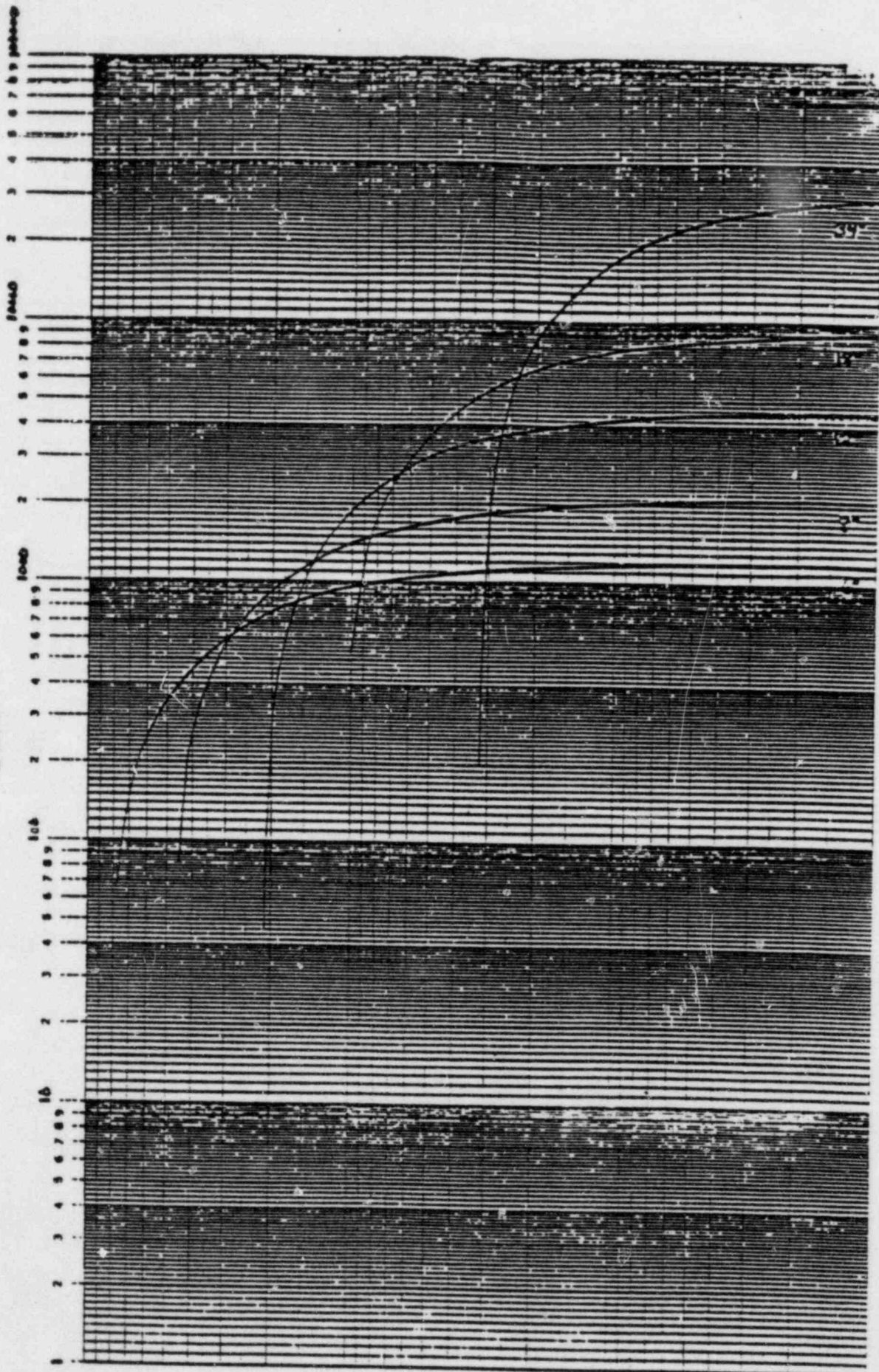
SCFM

SECOND
x 10³

K&E LOGARITHMIC 3 x 5 CYCLES
NEUFFEL & ESSEN CO. NEW YORK 1914

46 7520

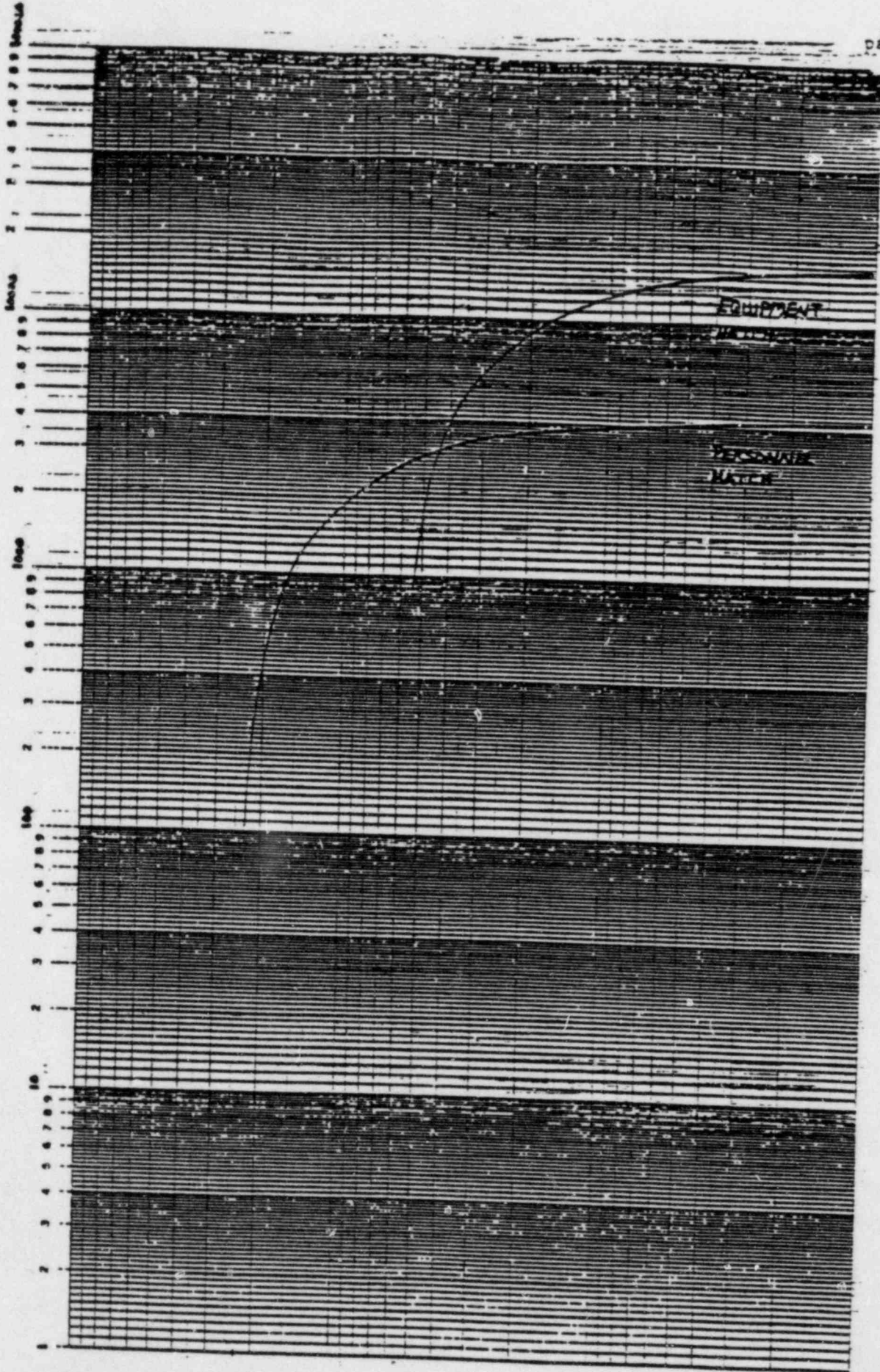
SCFM x 10



SECOND
x 10

46 7520

SCFM $\times 10^3$



DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: OP/O/A/6200/21
Change(s) 2 to
3 Incorporated
Revision #2

- (2) STATION: Catawba
- (3) PROCEDURE TITLE: Operating Procedure for the Post Accident Liquid
Sampling Systems
- (4) PREPARED BY: A.P. Jackson DATE: 2/12/85
- (5) REVIEWED BY: C.W. Balin DATE: 2/13/85
- Cross-Disciplinary Review By: (N/R) C.W.B.
- (6) TEMPORARY APPROVAL (IF NECESSARY):
- By: _____ (SRO) Date: _____
- By: _____ Date: _____
- (7) APPROVED BY: J.W. Coy Date: 2/13/85
- (8) MISCELLANEOUS:

Re Approved By: _____ Date: _____

R. Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
OPERATING PROCEDURE FOR THE
POST ACCIDENT LIQUID SAMPLING SYSTEMS

1.0 PURPOSE

The purpose of the Post Accident Liquid Sampling System is to provide a method for promptly obtaining reactor coolant samples under a nuclear reactor accident condition.

Samples acquired during accident conditions (normal sample points are not usable due to high radiation conditions) will aid in the evaluation of information related to:

- 1) The extent of core damage which has occurred.
- 2) Types and quantities of fission products released to containment liquid.
- 3) Reactor Coolant Chemistry and Radiochemistry.

2.0 LIMITS AND PRECAUTIONS

- 2.1 In an accident situation the decision to collect a post-accident sample will originate from the Technical Support Center. The management involved in this decision should take two factors into consideration in making this decision:

- (a) Has the situation stabilized to a degree so as to minimize the risk to individuals involved in the sampling?
- (b) From the present information available, has the system stabilized to a degree that a representative sample may be obtained?

- 2.2 The PALS panel should only be used under the following circumstances:

- (a) Caution: 1/2EMF48 must have flow for readings to be valid.

The Reactor Coolant System (NC) Gross Specific Activity is expected to be or is known to be greater than 200 $\mu\text{Ci/ml}$. This corresponds to a reading on 1/2EMF48 of equal to or greater than 1.64×10^5 counts per minute.

(Correlation factor from HP/O/B/1000/10 is 1.22×10^{-3} ($\mu\text{Ci/ml})(\text{CPM})$)

- (b) Primary Systems Sample Sinks 1A and 1B are inaccessible due to the radiation levels or for other identified reasons.

- (c) The Station Chemist or his designee has requested that the PALS panel be put in service.
 - (d) The PALS panel is being run for monthly operational verification, maintenance, or training purposes.
 - (e) When use of the normal Primary Sample systems will create a Radiation Exposure problem in the NM Lab.
- 2.3 The undiluted sample volume is 5.2 ml and the final dilution volume shall be controlled between 250-3500 ml.
- 2.4 Health Physics personnel must perform continuous radiation monitoring during sampling at the liquid sample or control panel. During an accident situation, Health Physics personnel from the OSC must monitor all personnel entering the Auxiliary Building.
- 2.5 When handling radioactive samples, good laboratory practices are essential to prevent radioactive contamination of personnel, equipment, and physical structures. Reference applicable SWRP(s) and RWP(s).
- 2.6 Individuals that have been trained on this procedure are qualified to use this procedure. Individuals shall be trained at a minimum frequency of (6) months.
- 2.7 Due to the nature of this procedure, a Working Copy shall be used to ensure compliance.
- 2.8 Do not leave the selector knob in "Grab Sample", Position 4 longer than is required to complete all the necessary steps of that position.
- 3.0 PANEL PREPARATION

3.1 Initial Conditions

- 3.1.1 In order to expedite the process, the Primary Supervisor or his designee should send two Chemistry Technicians to collect the sample.

The technicians should be chosen taking into consideration the following:

- (a) Being qualified on the PALS procedure
- (b) Being respiratory qualified
- (c) Age
- (d) Accumulated Exposure
- (e) Sex
- (f) Physical Strength

Their responsibilities are outlined below:

Technician #1

- (a) Completes the Initial Conditions Checklist Enclosure 8.1 from OP/O/A/6200/21 at the TSC and returns the checklist to Technician #2.
- (b) Informs Health Physics at the OSC that he/she will be traveling to the Hot Lab.
- (c) Dresses out as necessary.
- (d) Travels to the Hot Lab and prepares for the analyses.
- (e) Transports samples from the NM Lab to the Hot Lab, if necessary.
- (f) Analyzes the samples.
- (g) Reports results by phone to the Station Chemist at the TSC and returns to the OSC.
- (h) Transports the completed data sheet to the Station Chemist at the TSC.

Technician #2

- (a) Obtains the PALS panel keys. (Location: Secondary Supervisor's Office Key Box or Cold Lab Key Box)
- (b) Dresses out as directed by Health Physics at the OSC.
- (c) Health Physics plans out a path to be taken to the NM Lab, Hot Lab, Count Room and to exit the Auxiliary Building.
- (d) Travels to the NM Lab and uses the PALS to collect liquid and gas samples.
- (e) Transports the samples to the Hot Lab.
- (f) Assists in the analysis of samples, if necessary.
- (g) Reports results by phone to the Station Chemist at the TSC and returns to the OSC.

- 3.1.2 (Technician #1) - Complete the Initial Conditions Checklist (Enclosure 8.1) at the TSC and return it to Technician #2 at the OSC.
- 3.1.3 (Technician #1) - Inform Health Physics at the OSC of your plans to travel to the Hot Lab. Inform Health Physics that travel to the outside east backside of the Auxiliary Building may be required in order to calibrate the Gas Chromatograph. Also, inform them that you may transport the sample from the NM Lab to the Hot Lab. Dress out as required by Health Physics. The Hot Lab may be locked so bring the key.
- 3.1.4 (Technician #1) - In the Hot Lab, prepare for the sample analyses required in Section 7.0 of OP/O/A/6200/21.
- 3.1.5 (Technician #2) - Obtain the PALS panel keys from the Secondary Supervisor's office Key Box or the Cold Lab key box.

3.1.6 (Technician #2) - Report to the OSC and inform Health Physics of plans to obtain a post-accident liquid sample. Dress out as required by Health Physics. Health Physics personnel will decide the route to be taken to the PALS panel, the route to carry sample to the Hot Lab and Count Room, and the exit route back to the OSC. They will also address stay times (1-2 hours at the PALS Control Panel) and protective radiological dress and equipment. A Health Physics technician must be with any Chemistry personnel entering the Auxiliary Building at all times. Remember: The buddy system is in effect.

3.1.7 (Technician #2) - Travel to the NM lab with Health Physics coverage to collect a sample using the PALS panel. Remember to bring the required equipment listed on Enclosure 8.1, Part III.

3.2 Control Panel Preparation (Technician #2 - 543' Elev. NM Sample Room)

3.2.1 Close the following valves:
(Omit during periodic testing)

	<u>Unit 1</u>	<u>Unit 2</u>
--	---------------	---------------

NC Hot Leg Smp1 Hdr to Radiation Monitor	1NM29	2NM29
--	-------	-------

NC Hot Leg Sample HX 1A Outlet	1NM264	2NM264
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NC Hot Leg Sample HX 1B Outlet	1NM278	2NM278
--------------------------------	--------	--------

ND Smp1 HX Outlet	1NM265	2NM265
-------------------	--------	--------

3.2.2 Open the following Operations valves:

	<u>Unit 1</u>	<u>Unit 2</u>
--	---------------	---------------

Post Accident Liquid Sample Panel Hx Inlet	1KCA8	2KCA8
--	-------	-------

Post Accident Liquid Sample Panel Hx Outlet	1KCA10	2KCA10
---	--------	--------

3.2.3 Open 1NM462 (2NM462), PASP Deaerator Tank Inlet.

3.2.4 Call the Control Room and obtain the official time on the Control Room clocks. Set the clock near the PALS panel to the correct time.

3.2.5 Contact the Control Room and have them open the appropriate valve(s) listed below to obtain the desired sample. Reference Enclosure 8.1, Part 1(b).
(Omit during periodic testing)

<u>NC Hot Leg A</u>	<u>Unit 1</u>	<u>Unit 2</u>
Hot Leg Smp1 Hdr Cont Isol.	1NM26B	2NM26B
Hot Leg A Smp1 Cont. Isol.	1NM22A	2NM22A

NC Hot Leg C

Hot Leg Smpl Hdr Cont. Isol.	1NM26B	2NM26B
Hot Leg C Smpl Cont. Isol.	1NM25A	2NM25A

ND Pump 1A Discharge

ND Pump 1A Disch Smpl Line Isol.	1NM39	2NM39
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ND Pump 1B Discharge

ND Pump 1B Disch Smpl Line Isol.	1NM40	2NM40
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- 3.2.6 Turn the position selector knob to "RESET" position. Place the key in the keylock power switch and turn to the right. ("Sample Position"). Press "Reset" button.
- 3.2.7 Place the toggle switch for the dilution water flow totalizer to "ON".
- 3.2.8 Place the toggle switch for the radiation monitor to "ON". Turn the scale switch to "BAT" to check the battery. The needle should travel to full scale. Turn the scale switch to "mR/hour". The "Rem/hour" scale may be used if readings are off the scale. If the radiation monitor is not functional, rely on Health Physics surveys to determine access to the sample panels.
- 3.2.9 Push in the pH probe "Standardize" knob.
- 3.2.10 Select the system to be sampled with the system selector - RX COOLANT (refers to NC Hot Leg), RX SUMP (refers to ND Pump Discharge).
- 3.2.11 Verify that the pH 6.86 buffer solution has been changed within the last 30 days by referencing Enclosure 6.8 from OP/O/A/6200/11. This enclosure is located in a notebook in the PALS drawer.
- 3.2.12 Connect the PALS nitrogen cylinder to the PALS by connecting the quick disconnect to the N₂ supply line. Open the cylinder valve and set the pressure regulator to 110 psig.
- 3.2.13 Flush (Position 6)
 - 3.2.13.1 Turn the SELECTOR KNOB TO "Flush", Position 6.
 - 3.2.13.2 Press the "SELECTION POWER-ACTIVATE" button.
 - 3.2.13.3 Press the "FLUSH STEP" button momentarily and wait 1 minute. The first flush light should be lit. (Gas Tank).

- 3.2.13.4 Press the "FLUSH STEP" button momentarily and wait for 2 minutes. Second flush light should be lit. (Probes)
- 3.2.13.5 Press the "FLUSH STEP" button momentarily and wait 4 minutes. Third flush light should be lit. (Dilution Tank)
- 3.2.13.6 Press the "FLUSH STEP" button momentarily and wait 1 minute. Fourth flush light should be lit. (Liquid Tank)
- 3.2.13.7 Press the "FLUSH STEP" button momentarily. This terminates the flushing cycles and the "COMPLETE" light turns on.
- 3.2.13.8 Turn the selector knob to "DRAIN", Position 7.
- 3.2.14 Drain (Position 7)
 - 3.2.14.1 Press the "SELECTION POWER-ACTIVATE" button.
 - 3.2.14.2 Press the "DRAIN STEP" button momentarily and wait 4 minutes. First drain light should be lit. (Dilution Tank).
 - 3.2.14.3 Press the "DRAIN STEP" button momentarily and wait 1 minute. The second drain light should be lit. (Gas Line)
 - 3.2.14.4 Press the "DRAIN STEP" button momentarily and wait 1 minutes. The third drain light should be lit. (Gas Tank)
 - 3.2.14.5 Press the "DRAIN STEP" button momentarily and wait 1 minute. The fourth drain light should be lit. (Probe refill and system vent).
 - 3.2.14.6 Press the "DRAIN STEP" button momentarily. This terminates the draining cycles and the "COMPLETE" light is illuminated.

4.0 PANEL OPERATION (Technician #2)

4.1 Initial Conditions

- 4.1.1 Section 3.0 is complete with the Enclosure 8.1 signed off.

4.2 Panel Prep (Position 1)

- 4.2.1 Turn the selector knob to the "PANEL PREP" position.
- 4.2.2 Press the "SELECTION POWER - ACTIVATE" button.
- 4.2.3 Press the "PURGE" button, hold for 30 seconds and release.

- 4.2.4 Press the "DRAIN"[←] button and hold for 30 seconds then release.
- 4.2.5 Press the "CALIBRATE" button and hold until the pH meter stabilizes.
- 4.2.6 Adjust the pH meter to the known pH of the standard.
- 4.2.7 Press the "PURGE" button for 30 seconds and then release.
- 4.2.8 Press the "FLUSH" button and hold until the pH meter stabilizes (1 to 3 minutes) (pH of demineralized water) then release.
- 4.2.9 Press the "PURGE" button for 30 seconds and release.
- 4.2.10 Press the "DRAIN" button for 30 seconds and release.
- 4.2.11 Record the radiation monitor reading on Enclosure 8.2. (Background)
- 4.2.12 Turn the selector knob to "SAMPLE", Position 2.
- 4.3 Sample (Position 2)
 - 4.3.1 Press the "SELECTION POWER - ACTIVATE" button. Record the 'Time Sample Purged Started' on Enclosure 8.2. Verify a flow rate of 0.3-1GPM on 1NMFT5430 Sample Purge Flow Indicator. (For Periodic Testing, purge for five minutes before proceeding.) Refer to Enclosure 8.7 Step 6 for proper purge times in an accident situation.
 - 4.3.2 If TC1 goes above 50°C, turn the selector knob to "Reset" and press the "Reset" button. Call the Primary Supervisor or his designee. At the completion of the purge time, record the radiation reading on Enclosure 8.2.
 - 4.3.3 Press the "PRESSURIZE" button momentarily. When the pressure stabilizes record the reading on Enclosure 8.2. Record this time as the "Sample Trap Time" on Enclosure 8.2.
 - 4.3.4 Press the "TRAP" button momentarily.
 - 4.3.5 Turn the selector knob to "PRESSURIZATION AND GAS STRIPPING", Position 3.
- 4.4 Depressurization and Gas Stripping (Position 3)
 - 4.4.1 Verify that the vacuum gauge on the control panel shows at least 25 inches mercury.
 - 4.4.2 Press the "SELECTION POWER-ACTIVATE" button. Wait at least 60 seconds and then verify the Incoming Sample Pressure gauge reads less than 400 psig pressure.

- 4.4.3 Press the "GAS STRIPPING START" button momentarily beneath the water totalizer and monitor the vacuum gauge. Press the "GAS STRIPPING STOP" button momentarily when the vacuum gauge needle reads $+ 15 \pm 1$ inch mercury. If ± 1 inch is not achieved, a new stripped gas sample will need to be taken (i.e.) start from Section 4.2.
- 4.4.4 Turn the selector knob to "GRAB SAMPLE", Position 4.
- 4.5 Grab Sample (Position 4)
 - 4.5.1 Press the "SELECTION POWER-ACTIVATE" button.
 - 4.5.2 Press the "GRAB ML" button momentarily. Wait 1 minute.
 - 4.5.3 Preset the dilution water FLOW TOTALIZER to 02500 (for testing). In an accident situation, refer to the Station Chemist's Recommended dilution volume, Enclosure 8.1, Part IV. Press the "RESET" on the flow totalizer button. Press the "START" button and let the dilution continue to completion. Record the flow totalizer setting on Enclosure 8.2
 - 4.5.4 Press the "MIXING" button and hold for 10 seconds.
 - 4.5.5 Press the "GRAB SAMPLE-pH" button, momentarily. Allow the meter to stabilize.
 - 4.5.6 Record the pH reading on Enclosure 8.2.
 - 4.5.7 Press the "GAS SAMPLE - TRAP OPEN" button momentarily. Wait 10 seconds.
 - 4.5.8 Press the "GAS SAMPLE - TRAP CLOSE" button momentarily.
 - 4.5.9 Turn the selector knob to position 5 "LIQUID SAMPLE".
- 4.6 Liquid Sample (Position 5)
 - 4.6.1 Press the "SELECTION POWER-ACTIVATE" button.
 - 4.6.2 Hold the "LIQUID SAMPLE-TRAP OPEN" button for 10 ± 3 seconds.
 - 4.6.3 Immediately after 10 ± 3 seconds, press the "LIQUID SAMPLE-TRAP CLOSE" button momentarily.
 - 4.6.4 Turn the selector knob to "FLUSH", Position 6.
- 4.7 Flush (Position 6)
 - 4.7.1 Press the "SELECTION POWER-ACTIVATE" button.
 - 4.7.2 Press the "FLUSH STEP" button momentarily and wait 1 minute. The first flush light should be lit. (Gas Tank).

- 4.7.3 Press the "FLUSH STEP" button momentarily and wait for 2 minutes. Second flush light should be lit. (Probes)
- 4.7.4 Press the "FLUSH STEP" button momentarily and wait 4 minutes. Third flush light should be lit. (Dilution Tank)
- 4.7.5 Press the "FLUSH STEP" button momentarily and wait 1 minute. Fourth flush light should be lit. (Liquid Tank)
- 4.7.6 Press the "FLUSH STEP" button momentarily. This terminates the flushing cycles and the "COMPLETE" light turns on.
- 4.7.7 Turn the selector knob to "DRAIN", Position 7.
- 4.8 Drain (Position 7)
 - 4.8.1 Press the "SELECTION POWER-ACTIVATE" button.
 - 4.8.2 Press the "DRAIN STEP" button momentarily and wait 4 minutes. First drain light should be lit. (Dilution Tank).
 - 4.8.3 Press the "DRAIN STEP" button momentarily and wait 1 minute. The second drain light should be lit. (Gas Line)
 - 4.8.4 Press the "DRAIN STEP" button momentarily and wait 1 minutes. The third drain light should be lit. (Gas Tank)
 - 4.8.5 Press the "DRAIN STEP" button momentarily and wait 1 minute. The fourth drain light should be lit. (Probe refill and system vent).
 - 4.8.6 Press the "DRAIN STEP" button momentarily. This terminates the draining cycles and the "COMPLETE" light is illuminated.
- 4.9 Reset
 - 4.9.1 Turn the selector knob to "RESET" and press the "RESET" button.
 - 4.9.2 If the "PUMP SUMP" light is lit, it indicates the sump has water in it. Turn the SYSTEM POWER KEY to the left to operate the sump pump. The "PUMP ON" light will light and remain on until the pump has stopped.
 - 4.9.3 After the "PUMP COMPLETE" light turns on, indicating that the pump has stopped, turn the SYSTEM POWER KEY to the right to re-energize the PALS.
 - 4.9.4 Contact the Control Room and have them close the sample valves opened in Section 3.2.5. (Omit during Periodic Testing.)

- 4.9.5 Record the radiation level after flushing on Enclosure 8.2. If the field at the panel is greater than 3 Rem/hr. (3000 mR/hr.), go to Section 5.0.
- 4.9.6 If this is the last sample to be collected this trip, proceed to Section 4.10, Sample Panel Shutdown. If other samples are to be collected this trip proceed to Section 6.0, Sample Retrieval.

4.10 Sample Panel Shutdown

- 4.10.1 Turn the SYSTEM POWER KEY to the vertical off position and turn the position selector knob to "RESET".
- 4.10.2 Place the panel keys in a plastic bag with Enclosure 8.1 (NC or ND Loop data). (Omit during periodic testing.)
- 4.10.3 Turn the toggle switch for the dilution water meter to "OFF".
- 4.10.4 Turn the toggle switch for the radiation monitor to "OFF".
- 4.10.5 Pull out the pH probe standardize knob.
- 4.10.6 Close nitrogen cylinder valve and disconnect the quick disconnect.
- 4.10.7 Turn System Selector Knob to off.
- 4.10.8 Enter 00000 on flow totalizer.
- 4.10.9 Proceed to Section 6.0, Sample Retrieval.

5.0 DECONTAMINATION

- 5.1 Repeat the panel Flush, Drain and Reset Modes: Sections 4.6.4 through 4.9.3.
- 5.2 If the level is less than 3 Rem/hour, turn the SYSTEM POWER KEY to the vertical position and continue with Section 4.9.6. If however, the radiation level remains greater than 3 Rem/hour, go back to Step 4.2 and repeat the sequence using a larger dilution volume based on the calculations of Enclosure 8.4.

6.0 SAMPLE RETRIEVAL

6.1 Initial Conditions

- 6.1.1 A gas and degassed liquid sample are in the gas and liquid samplers, respectively through the completion of Section 4.0.
- 6.1.2 Health Physics personnel are providing continuous monitoring of the area.

6.2 Sampling

- 6.2.1 Take two labels from the PALS drawer. Fill out the labels as follows (including the required information):

Label one: "Liquid Sample Name _____
Initials _____
Date _____
Sample Trap Time _____
Dilution Factor _____"

Label the other: "Gas Sample Name _____
Initials _____
Sample Trap Time _____"

The "Sample Trap Time" and "Dilution Factor" may be found on Enclosure 8.2.

- 6.2.2 Take a 50 ml Nalgene sample bottle from the PALS drawer. Label it as follows:

"Dilution Water Sample _____
Date _____"

- 6.2.3 Take the completed labels and place each one on a plastic bag. Place another plastic bag inside of each of the two labeled plastic bags. These will be used later for double bagging the samples.

CAUTION: Do not approach the samplers on the sample panel until a Health Physics Technician has surveyed the area. Do not rely solely on the PALS panel's radiation monitor (1NMM15350) as an indication the radiation in the area. (Omit during periodic testing).

- 6.2.4 Approach the samplers located on the sides of the sample panel. If possible, have the Health Physics Technician take an contact readings on each sample vessel. (Omit during periodic testing).
- 6.2.5 Detach the quick-disconnects on each sample vessel. Place the samplers in the labeled plastic bags. Seal tightly.
- 6.2.6 Place the samples in the sample carrier.
- 6.2.7 Open valve 1NM456 (2NM456) and fill the 50 ml nalgene sample bottle labeled "DILUTION WATER SAMPLE". Then, CLOSE 1NM456 (2NM456). CLOSE 1NM462 (2NM462).

6.2.8 After returning to the outer room, record the "On Contact" liquid and gas radiation readings on Enclosure 8.2. (Omit during periodic testing).

6.2.9 If this is the last sample to be collected this trip, take the samples to the Hot Lab in the sample carrier and place in an operating fume hood behind a lead brick shield to await analysis. However, if another sample is to be collected, call Technician #1 at the Hot Lab and have him come down and transport the samples and the completed portion of Enclosure 8.2 up to the lab. Then proceed with Section 6.2.10 to begin the collection of a second sample.

One of the sample hoods in the Hot Lab should be designated specifically for sample storage. Lead bricks should line the front of the sample hood so that samples may be placed behind them.

6.2.10 In order to begin the process of collecting a second sample perform Steps 3.2.5 and 3.2.10.

6.2.11 Attach new liquid and gas samplers on the side of the PALS panel. New samplers are located in the PALS drawer.

6.2.12 Begin at Step 4.2, Panel Prep. and repeat the procedure for the new sample.

7.0 SAMPLE ANALYSIS

7.1 Initial Conditions (Technician #1)

7.1.1 A fume hood in the Hot Lab is prepared to accept a post-accident sample: (1) the ventilation fan is on and (2) Lead bricks line the front of the panel.

7.1.2 Two 5cc lockable sample syringes have been verified workable and evacuated.

7.1.3 A 5cc vial has been evacuated and placed in the fume hood.

7.1.4 A clean 50 ml nalgene sample bottle has been placed in the sample hood.

7.1.5 Reagents to run CP/O/A/8100/16 have been prepared and standards have been run.

7.1.6 The Gas Chromatograph has been started up and standardized per CP/O/A/8100/48, Chemistry Procedure for the Determination of Stripped by G. C.

7.2 Stripped Gas Samples

CAUTION: Perform all actions involving the transfer, preparation, or analysis of the gas sample under a fume hood.

7.2.1 Inject a lockable 5cc syringe into the gas sampler and withdraw 1cc of sample. While still under the fume hood, inject the sample into an evacuated 5cc vial.

7.2.2 Double bag the vial. Seal tightly. Prepare a label for the bag as follows:

"Gas Sample Name _____
 Initials _____
 Date _____
 Actual Sample Time _____
 Sample Volume _____"

The "Gas Sample Name" and "Actual Sample Time" may be obtained from the gas sampler label. Calculate the actual sample volume as follows:

$$\text{Sample Volume} = \frac{110 \text{ ml}}{260 \text{ ml}} \times 1 \text{ ml} = .42 \text{ ml}$$

Where: 110 ml = liquid tank volume (including tubing)
 260 ml = gas tank volume (including tubing)
 1 ml = sample volume injected into vial

Complete the Sample Requisition Form using the sample volume calculated above to fill in the "Sample Volume" blank on the form. This will allow Health Physics to adjust isotopic activities from diluted samples to reflect reactor coolant activity.

7.2.3 Using a sample carrier, transport the sample to the Health Physics Count Room, or elsewhere for gamma spectral analysis.

7.2.4 Inject a lockable 5cc syringe into the gas sampler and withdraw 5cc of sample. Lock the syringe.

7.2.5 Analyze the 5cc sample of stripped gas per CP/O/B/8100/48.

7.3 Liquid Sample

CAUTION: Perform all actions involving the transfer, preparation, or analysis of the liquid sample in the fume hood.

7.3.1 Take 5 cc of liquid sample and prepare for analysis per CP/O/A/820G/04, Chemistry Procedure for the Determination of Gamma Isotopic Activity. Dilute 5 cc in a 50 cc bottle per the procedure. Report the actual sample volume being counted on the sample requisition form under "Sample Volume" and submit to Health Physics so that the appropriate adjustment of isotopic activities occurs. The calculation is as follows:

$$\text{Sample Volume} = 1/10 \times 5 \text{ cc}$$

Where: $1/10$ = Dilution Ratio from 5 cc in a
50 ml bottle
5 cc = Diluted Sample Volume

Double bag the vial. Seal tightly. Prepare a label for the bag as follows:

"LIQUID SAMPLE NAME _____
INITIALS _____
DATE _____
ACTUAL SAMPLE TIME _____
SAMPLE VOLUME _____"

The "LIQUID SAMPLE NAME" and "ACTUAL SAMPLE TIME" can be obtained from the liquid sampler label. The "SAMPLE VOLUME" was calculated above.

- 7.3.2 Take 50 ml of liquid sample and analyze for Boron per CP/O/A/8100/16.

Then, multiply the ppm BORON MEASURED, ie. the value obtained per CP/O/A/8100/16 by the Dilution Factor to obtain the ppm Boron in the Reactor Coolant.

ppm BORON IN THE REACTOR COOLANT =

ppm BORON MEASURED X DILUTION FACTOR

Record the "Boron Concentration" on Enclosure 8.2.

- 7.3.3 Subtract the initial background activity (Section 4.2.11) from sample activity found at purge time completion (Section 4.3.2) and record on Enclosure 8.2. This is the radiation due to the sample.

- 7.3.4 Chloride analysis

CAUTION: Perform all actions which involve the transfer of the liquid sample to another container under the fume hood.

- 7.3.4.1 Contact the Station Chemist at the TSC (#2531). Ask him to contact the General Office personnel (at the Crisis Management Center during an accident situation). Inform them that a post-accident liquid sample is to be transported to the Physical Sciences Building for chloride analysis on the ion-chromatograph. They should contact A. M. Deak for workload clearance. Also, ask the Station Chemist to fill out a Chemical Sciences Analysis Request Form, Enclosure 8.9 for the sample.

7.3.4.2 A hard copy of the gamma spectrum and tritium data as well as the sample volume should be transferred to the Physical Sciences Building Radiation Protection Officer (J. S. Isaacson) or her designee. A telecopy can be sent to the Technical Training Center.

7.3.3.3 Transfer 20 ml \pm 5 ml of sample from the liquid sample to a 50 ml nalgene bottle.

7.3.3.4 Double bag the bottle. Seal tightly. Label the bag as follows:

"LIQUID SAMPLE NAME _____
INITIAL _____
DATE _____
ACTUAL SAMPLE TIME _____
DILUTION FACTOR _____"

The "ACTUAL SAMPLE TIME" and "DILUTION FACTOR" may be obtained from Enclosure 8.2. Place the bag in a shielded container for transport.

7.3.3.5 Once the sample shipment has been authorized by the Radiation Protection Officer, the sample shipment should be sent to the Physical Sciences Building in care of the Radiation Protection Officer. The dilution water sample obtained in Step 6.2.7 should also be sent for analysis at this time.

7.3.3.6 When the sample results are obtained record the results on Enclosure 8.2.

7.4 If the dilution proves inadequate for any of the above procedures contact the Station Chemist or his designee.

7.5 Report all results in the Primary Chemistry Legal Log. In an accident situation results should be relayed by phone to the Station Chemist at the TSC as soon as possible. Phone number, 2531.

7.6 Clean the liquid and gas samplers under the fume hood. Remove and replace the septum in the gas sampler. Flush the liquid sampler with Super Q water.

7.7 With Enclosure 8.2 in a plastic bag, exit the Auxiliary Building. Check out through the Operation's Support Center.

7.8 Transport Enclosure 8.2 to the Station Chemist at the TSC.

8.0 ENCLOSURES

- 8.1 Initial Conditions Checklist
- 8.2 PALS Data Sheet
- 8.3 Valve Alignment
- 8.4 Correction of Dilution Volume
- 8.5 PALS Control Panel Layout
- 8.6 Valve Sequence Table
- 8.7 General Information
- 8.8 Operation's Supply Valves to the PALS Valve Alignment
- 8.9 Chemical Sciences Analysis Request Form

ENCLOSURE 8.1
OP/O/A/6200/21

INITIAL CONDITIONS CHECKLIST

Date: ____/____/____

PART I. (Verifying the System's Ability to Function)

Initial/Date

1. Verify that the Post Accident Liquid Sampling System Periodic Test, PT/1/A/4208/1A is current prior to sampling. (Periodic Test Program - Computer Printout)

____/____

PART II. (Interfacing Groups)

Initial/Date

1. Contact Operations (complete at TSC).

- (a) If this is an accident situation, the containment should have been isolated by an ST signal. Verify that the signal has been cleared.

____/____

Initial/Date

CAUTION: Warn Operations not to open any sample lines until Chemistry has realigned valves in the NM lab. Opening containment isolation sample valves too early could increase radiation levels in the NM lab.

- (b) Request permission to open the desired valves out of the list below. Place a check beside the sample point(s) to be used.

____/____

<u>NC Hot Leg A</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Check</u>
Hot Leg Smpl Hdr Cont Isol	1NM26B	2NM26B	
Hot Leg A Smpl Cont Isol	1NM22	2NM22A	_____
<u>NC Hot Leg C</u>			
Hot Leg Smpl Hdr Cont Isol	1NM26B	2NM26B	
Hot Leg C Smpl Cont Isol	1NM25A	2NM25A	_____
<u>ND Pump 1A Discharge</u>	<u>Unit 1</u>	<u>Unit 2</u>	
*ND Pump 1A Disch Smpl Line Isol	1NM39	2NM39	_____
<u>ND Pump 1B Discharge</u>	<u>Unit 1</u>	<u>Unit 2</u>	
*ND Pump 1B Disch Smpl Line Isol	1NM40	2NM40	_____

*Verify with Operations that the respective A or B Train is in service.

Initial/Time

- (c) Verify with Operations that 1KC Essential Supply Header "1A" is in operation for Unit 1 Sampling. For Unit 2: 2KC "2A" is required.

____/____

ENCLOSURE 8.1
OP/O/A/6200/21

INITIAL CONDITIONS CHECKLIST

Date: ____/____/____

Initial/Time

- (d) Request permission to open or to have an operator open the following Operations valves in order to provide cooling water flow to the panel. These valves are locked closed. The keys should be obtained prior to proceeding to the panel.

____/____

	<u>Unit 1</u>	<u>Unit 2</u>
Post Accident Liquid Sample Panel Hx Inlet	1KCA8	2KCA8
Post Accident Liquid Sample Panel Hx Outlet	1KCA10	2KCA10

- (e) Verify Power Panel Boards 1KXPA and 1KXPB are energized for Unit 1 Sampling. (Unit 2 Later)

____/____

2. Contact Radwaste Chemistry (Complete at TSC).

Initial/Date

Notify Radwaste Chemistry that the PALS panel will be operated. Waste Liquid from the panel is pumped to WEFT Sump "A".

____/____

3. Contact Health Physics (Complete at TSC)

Initial/Date

- (a) Request Health Physic's Coverage for obtaining a post-accident liquid sample.

____/____

Initial/Date

- (b) Verify Health Physic's ability to count a sample in the Count Room or elsewhere.

____/____

PART III. (Required Equipment)

Check

1. Technician #2 should have the following items before departing to the NM lab:

- (a) The PALS panel keys (A set of keys are located in the Secondary Supervisor's office and the Cold Lab)
- (b) A Working Copy of OP/O/A/6200/21 with Enclosure 8.1 completed.
- (c) A High Radiation Area Key for the NM Lab.
- (d) A Shielded Sample Carrier
- (e) Plastic bags left on Cold Side

ENCLOSURE 8.1
OP/0/A/6200/21

INITIAL CONDITIONS CHECKLIST

Date: ____/____/____

PART IV Recommended Dilution Volume (From Station Chemist at TSC)

<u>Dilution Volume (ml)</u>	<u>Flow Totalizer Setting</u>	<u>Check One</u>
250.0	02500	_____
500.0	05000	_____
1000.0	10000	_____
3500.0	35000	_____

Station Chemist

Initial/Date

____/____

ENCLOSURE 8.2
OP/0/A/6200/21

PALS DATA SHEET

(Circle One)
NC Loop A - C Data (Page I of II)

Initial/Date

____/____

PART I. (Complete at Control Panel)

TIME

- | | | |
|--|---|-------|
| 1. Radiation Field (Background) | _____ mR/hr | _____ |
| 2. Time sample purge started. | | _____ |
| 3. Radiation field (with sample flow) | _____ mR/hour | _____ |
| 4. <u>Radiation due to sample, (#3) - (#1)</u> (Complete after
Sample Collection) | _____ mR/hour | _____ |
| 5. Pressure at isolation | _____ psig | _____ |
| 6. Sample Trap Time | | _____ |
| 7. Flow totalizer setting | _____ | _____ |
| 8. <u>pH of sample</u> | _____ | _____ |
| 9. Radiation reading after panel flush | _____ mR/hour | _____ |
| 10. Radiation reading on contact with samplers.
(Omit during Periodic Testing.) | Gas _____ mR/hour _____
Liquid _____ mR/hour _____ | |

ENCLOSURE 8.2
OP/0/A/6200/21

PALS DATA SHEET

(Circle One)
NC Loop A - C Data (Page II of II)

Initial/Date

____/____

PART II. (Complete at Hot Lab)

TIME

- | | |
|---|-------|
| 1. Hydrogen Concentration _____ cc/kg H ₂ | _____ |
| 2. Boron Concentration _____ ppm B | _____ |
| 3. Dilution Factor _____ Reference Enclosure 8.7, number 7 | |
| 4. Chloride Concentration _____ ppb Cl ⁻ | _____ |
| 5. Gamma Spectral Analysis (Gas) <u>(Attach H.P. Data Sheet)</u> | _____ |
| 6. Gamma Spectral Analysis (Liquid) <u>(Attach H.P. Data Sheet)</u> | _____ |

In an accident situation, the results from this data sheet should be forwarded to the Station Chemist at the Technical Support Center as soon as possible. TSC phone number - 2531.

Initial/Date

____/____

ENCLOSURE 8.2
OP/0/A/6200/21

PALS DATA SHEET

(Circle One)
ND Loop A - B Data (Page I of II)Initial/Date
____/____

PART I. (Complete at Control Panel)

TIME

- | | | |
|--|---|-------|
| 1. Radiation Field (Background) | _____ mR/hr | _____ |
| 2. Time sample purge started. | | _____ |
| 3. Radiation field (with sample flow) | _____ mR/hour | _____ |
| 4. <u>Radiation due to sample, (#3) - (#1)</u> (Complete after
After Sample Collection) | _____ mR/hour | _____ |
| 5. Pressure at isolation | _____ psig | _____ |
| 6. Sample Trap Time | | _____ |
| 7. Flow totalizer setting | _____ | _____ |
| 8. <u>pH of sample</u> | _____ | _____ |
| 9. Radiation reading after panel flush | _____ mR/hour | _____ |
| 10. Radiation reading on contact with samplers.
(Omit during Periodic Testing.) | Gas _____ mR/hour _____
Liquid _____ mR/hour _____ | |

ENCLOSURE 8.2
OP/O/A/6200/21

PALS DATA SHEET

(Circle One)
ND Loop A - B Data (Page II of II)

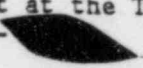
Initial/Date

____/____

PART II. (Complete at Hot Lab)

TIME

1. Hydrogen Concentration _____ cc/kg H₂ _____
2. Boron Concentration _____ ppm B _____
3. Dilution Factor _____ Reference Enclosure 8.7, number 7 _____
4. Chloride Concentration _____ ppb Cl⁻ _____
5. Gamma Spectral Analysis (Gas) (Attach H.P. Data Sheet) _____
6. Gamma Spectral Analysis (Liquid) (Attach H.P. Data Sheet) _____

In an accident situation, the results from this data sheet should be forwarded to the Station Chemist at the Technical Support Center as soon as possible. TSC phone number - 

Initial/Date

____/____

DUKE POWER COMPANY
 CATAWBA NUCLEAR STATION
 ENCLOSURE 8.3
 OP/0/A/6200/21
 VALVE ALIGNMENT

(Unit 1)
 LOCATION

VALVE NO.

VALVE NAME

POSITION INITIAL

1NM342	PASP Demin Supply Flow Meter Influent	▲B-543 EE-54 Rm. 238	THROTTLED	
1NM343	PASP Demin. Supply Isol to Smp1 Hdr	▲B-543 EE-54 Rm. 238	OPEN	
1NM351	PASP Air Eductor Isolation From VI	▲B-543 EE-54 Rm. 238	OPEN	
1NM298	Nitrogen Supply to PASP	▲B-543 EE-54 Rm. 238	OPEN	
1NM393	PASP Effluent to WEFT Sump A Isol	▲B-543 EE-54 Rm. 238	OPEN	
1NM321	PASP Liquid Tank Effluent to WEFT	▲B-543 EE-54 Rm. 238	THROTTLED	
1NM334	PASP Calibration Tank Vent to Aux Bldg Exhaust	▲B-543 EE-54 Rm. 238	CLOSED	
1NM328	PASP Sample Line Nitrogen Supply Isolation	▲B-543 EE-54 Rm. 238	OPEN	
1NM452	PASP Dilution Tank Sample	▲B-543 EE-54 Rm 238	CLOSED	
1NM449	PASP Calibration Tank Drain	▲B-543 EE-54 Rm. 238	CLOSED	
1KCC99	Sample Cooler Outlet Valve	▲B-543 EE-54 Rm. 238	OPEN	
1NM456	PASP Deaerator Tank Sample	▲B-543 EE-54 Rm. 238	CLOSED	
1NM453	PASP Liquid Tank Sample	▲B-543 EE-54 Rm. 238	CLOSED	
1NM448	PASP Nitrogen Inlet to Liquid Tank	▲B-543 EE-54 Rm. 238	OPEN	
1NM462	PASP Deaerator Tank Inlet	▲B-543 EE-54 Rm. 238	CLOSED	

ENCLOSURE 8.4
OP/O/A/6200/21

CORRECTION OF DILUTION VOLUME

To correct the dilution volume, divide the radiation reading after panel flush by 3 rem/hr. Then multiply this by the initial dilution volume to obtain the desired dilution volume in Section 4.5.3.

Example:

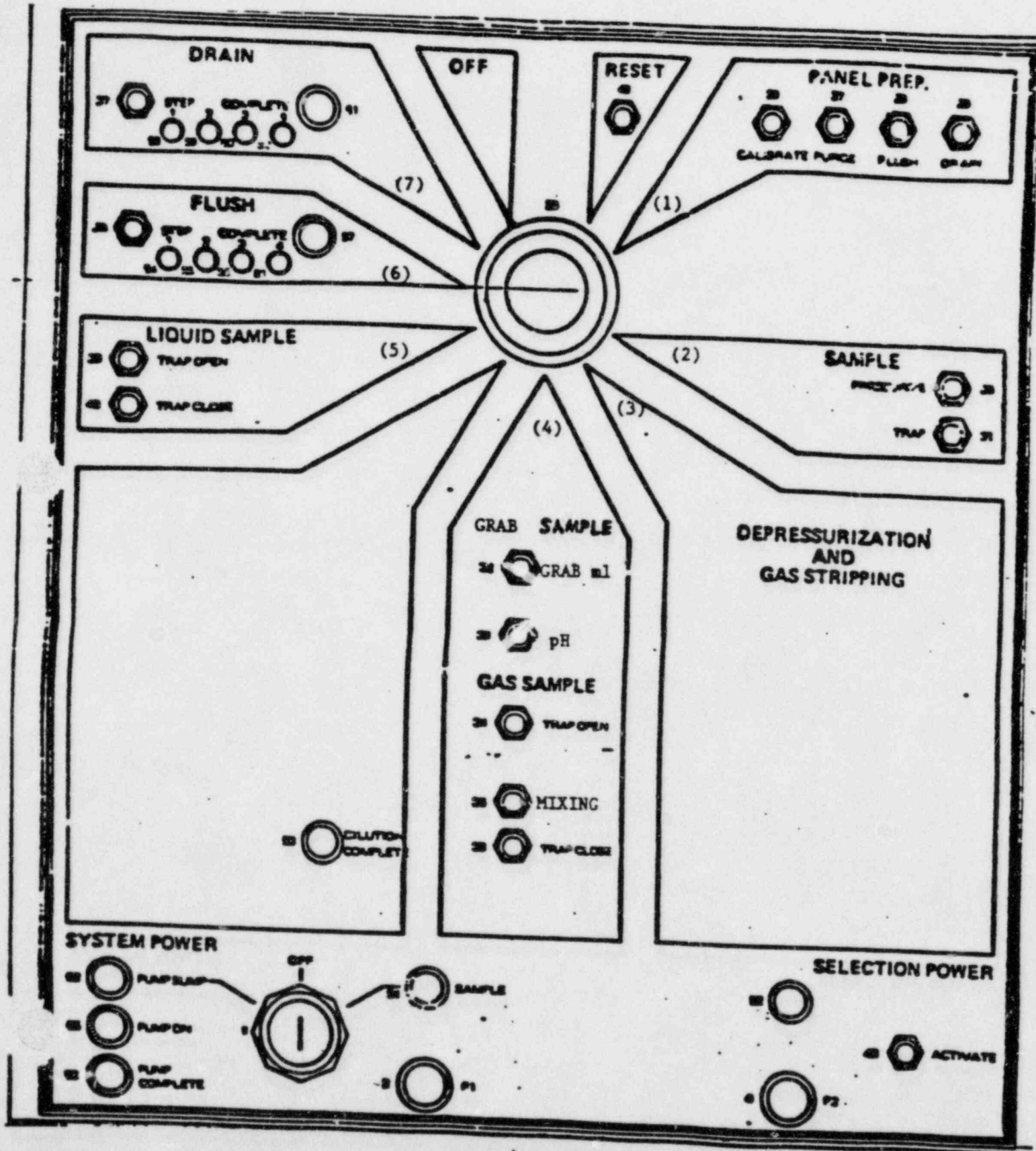
Initial Dilution Volume = 250 ml

Radiation reading after panel flush = 12 rem/hr (12000 mR/hr)

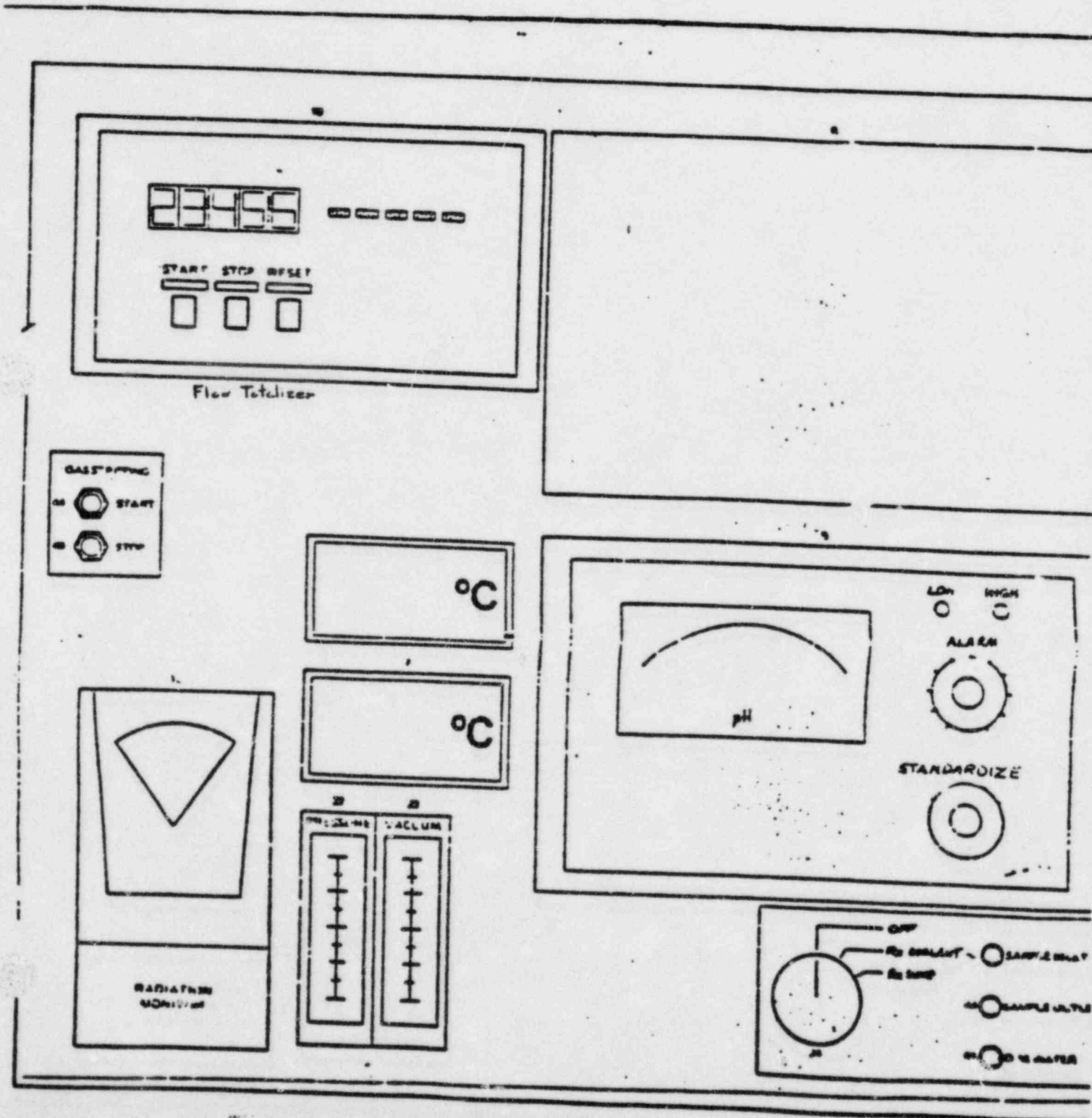
then $\frac{12 \text{ rem/hr}}{3} \times 250 \text{ ml} = 1000 \text{ ml}$

Go back to Section 4.2 and repeat the sample sequence. In Step 4.5.3, use the new dilution volume which was calculated as in the example above.

PALS CONTROL PANEL LAYOUT



PALS CONTROL PANEL LAYOUT



ENCLOSURE 8.6
OP/O/A/6200/21
VALVE SEQUENCE TABLE

<u>Function</u>	<u>Pushbutton Activation</u>	<u>Valves</u>
1.0 Panel Prep		1NM313, 1NM312, 1NM315 1NMSV0311, 1NM311, 1NM310, 1NM314, 1NMSV3201
1.1 Calibrate	H	1NM333, 1NM332
1.2 Purge	H	1NM330, 1NM338, 1NM307, 1NM305
1.3 Flush	H	1NM331, 1NM338, 1NM307, 1NM309
1.4 Drain	H	1NM338, 1NM307, 1NM305
2.0 Sample Trap		1KCA9, 1NM294, 1NM324 1NM319, 1NM313, 1NM312 1NMSV0311, 1NM314
2.1 Pressurize	M	<u>1NM319</u>
2.2 Trap	M	<u>1NM324</u>
3.0 Depressurization		1NM317, 1NM315
3.1 Gas Stripping Start	M	1NM325, 1NM327
3.2 Gas Stripping Stop	M	<u>1NM325</u> , <u>1NM327</u>
4.0 Liquid Sample		1NM339, 1NM346
4.1 Grab Sample	M	1NM318, 1NM325, 1NM329, 1NMSV0336
4.2 D.M. Flow Meter Start	M	1NM341, 1NM346
4.3 D.M. Flow Meter Stop	M	<u>1NM341</u> , 1NM346

ENCLOSURE 8.6
OP/0/A/6200/21
VALVE SEQUENCE TABLE

<u>Function</u>	<u>Pushbutton Activation</u>	<u>Valves</u>
4.4 Mixing	H	1NM340,
4.5 pH	M	1NMSV0336
4.6 Trap Open	M	1NM315, 1NM312, 1NMSV0311, 1NM324, 1NM319, 1NM345, 1NM322
4.7 Trap Close	M	1NM315, 1NM312, 1NMSV0311
5.0 Liquid Sample Prep	-	(Step incorporated into Step 5.0)
6.0 Liquid Sample II		1NM324, 1NM319, 1NM345, 1NM322, 1NM348 1NMSV0350, 1NM346
6.1 Trap Open	H	1NM319, 1NM346, 1NM309 1NM304, 1NM376
6.2 Trap Close	M	1NMSV0350
7.0 Flush		
7.1 Gas Tank	M	1NM316, 1NM312, 1NM308, 1NM309
7.2 Probes	M	1NM331, 1NM338, 1NM307, 1NM309
7.3 Dilute Tank	M	1NM347, 1NM301, 1NM309
7.4 Liquid Tank	M	1NM331, 1NM329, 1NM325, 1NM319, 1NM322
8.0 Drain		
8.1 Dilute Tank	M	1NM376, 1NM348, 1NM304, 1NM305

ENCLOSURE 8.6
OP/0/4/6200/21
VALVE SEQUENCE TABLE

<u>Function</u>	<u>Pushbutton Activation</u>	<u>Valves</u>
8.2 Gas Line	M	1NM323, 1NM315, 1NM312, 1NM308, 1NM305
8.3 Gas Tank	M	1NM323, 1NM315, 1NM317, 1NM325, 1NM329, 1NM338, 1NM307, 1NM305
8.4 Probe Refill & System Vent	M	1NM331, 1NM338, 1NM307, 1NM309, 1NM312, 1NM313, 1NM346, 1NM348, 1NM315, 1NMSV3200

LEGEND:

- M - Momentarily depressing the button initiates the function.
H - The function will operate as long as the pushbutton is depressed.
 \bar{N} - Indicates that the valve is de-energized when the pushbutton is depressed.

ENCLOSURE 8.7
OP/O/A/6200/21

GENERAL INFORMATION

1. PALS Panel Location: Unit 1 - (Room 238, Col. FF-55, AB-543)
Unit 2 - (Room 248, Col. FF-59, AB-543)

See page 2 of this enclosure for a general arrangement drawing.

2. Telephone Number at Control Panel - Ext. 2109 (Unit 1)
3. Breaker Information:

Unit 1

<u>Fdr. Breaker</u>	<u>Comp./Breaker</u>	<u>Description</u>	<u>Location</u>
1KXPA	#3	Post Accident Sampling Sample Pump and Sol. Vlvs.	AB 554' CC-57
1KXPB	#34	Post Accident Liquid Sampling Control Panel	AB 554 CC-56
*1KXPA	#22	Post Accident Air Sampling Control Panel	AB 554 CC-57

*The Post Accident Air Sampling Control Panel is under Health Physic's control.

Unit 2

(Later)

4. Area Radiation Monitor - 1EMF-2 is located in Room 238.
5. Station Chemist phone number at TSC - 2531.
6. Sample Line Purge Volumes

Unit 1

NC Loop A to PALS - 22.5 gallons (45 minute purge @ .5 GPM)
NC Loop C to PALS - 19.5 gallons (39 minute purge @ .5 GPM)
ND Loop A to PALS - 25.0 gallons (50 minute purge @ .5 GPM)
ND Loop B to PALS - 32.5 gallons (65 minute purge @ .5 GPM)

Unit 2

(Later)

7. Dilution Factors

<u>Flow Totalizer Setting</u>	<u>Dilution Factor</u>	<u>Dilution Water Added (ml)</u>
02500	48.4	250.0
05000		500.0
10000		1000.0
35000		3500.0

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
ENCLOSURE 8.8
OP/0/A/6200/21

OPERATION'S SUPPLY VALVES - VALVE ALIGNMENT

VALVE NO.

VALVE NAME

LOCATION

POSITION

INITIAL

	Unit 1 PALS Supply Valves			
1VI230	Root Isol.	AB-553 GG-56 Rm. 200	OPEN	
1VI86	Aux. Bldg. 543 Elev. VI Supply	AB-543 EE-53 Rm. 217	OPEN	
1YM436	Post Accident Unit 1 Sample Isol.	AB-543 FF-54 Rm. 238	OPEN	
1YM256	YM Header Isol	AB-543 FF-54 Rm. 238	OPEN	
1KCA8	Post Accident Liquid Sample Panel Hx Inlet	AB 546, EE-54 Rm. 238	LOCKED CLOSED	
1KCA10	Post Accident Liquid Sample Panel Hx Outlet	AB 546, EE-54 Rm. 238	LOCKED CLOSED	
	Unit 2 PALS Supply Valves			
2VI402	Liquid Sample Panel Supply Isol.	AB-543	OPEN	
2VI230	Unit 2 Aux. Bldg. Root Isol.	AB-543	OPEN	
2VI86	Aux Bldg 543 Elev. VI Supply	AB-543	OPEN	
1YM437	Post Accident Unit 2 Sample Isol.	AB-543 FF-60 Rm. 248	OPEN	
1YM140	YM Header Isolation	AB-543 FF-57 Rm. 200	OPEN	
2KCA8	Post Accident Liquid Sample Panel Hx Inlet	AB, 543, EE-FF, 60-61	LOCKED CLOSED	
2KCA10	Post Accident Liquid Sample Panel Hx Outlet	AB, 543 EE-FF, 60-61	LOCKED CLOSED	
	NOTE: The valves listed above all belong to Operations. Contact Operations if a valve is found in an incorrect position.			

12/10/1911

Station/Dept./Phone

Request Date

Results Reported To

[illegible]

clonal reformation
around, efficacy,
derivatives

Acceptance

Date _____

P. No.

Date Received _____

Date Completed

Approved By

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

DUKE POWER COMPANY
PROCEDURE PREPARATION
PROCESS RECORD

(1) ID No: HP/O/B/1000/06
Change(s) 0 to
8 Incorporated

(2) STATION: Catawba

(3) PROCEDURE TITLE: Emergency Equipment Functional Check and Inventory

(4) PREPARED BY: Lester J. Williams DATE: 2/12/85

(5) REVIEWED BY: Fletcher Wilson DATE: 2-12-85

Cross-Disciplinary Review By: _____ N/R: F. Wilson

(6) TEMPORARY APPROVAL (IF NECESSARY):

By: _____ (SRO) Date: _____

By: _____ Date: _____

(7) APPROVED BY: Jw. L. Date: 2/14/85

(8) MISCELLANEOUS:

Reviewed/Approved By: _____ Date: _____

Reviewed/Approved By: _____ Date: _____

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
EMERGENCY EQUIPMENT FUNCTIONAL CHECK AND INVENTORY

1.0 PURPOSE

To provide for the availability and readiness of Emergency Equipment.

2.0 REFERENCES

- 2.1 HP/O/B/1005/06; Respirator Quality Assurance
- 2.2 HP/O/B/1009/19; Emergency Radio System Operations, Maintenance and Communications
- 2.3 Catawba Nuclear Station Directive 2.11.13
- 2.4 Catawba Nuclear Station Directive 3.2.2
- 2.5 Catawba Nuclear Station Directive 3.3.3
- 2.6 Catawba Nuclear Station Emergency Plan
- 2.7 Catawba Nuclear Station Technical Specifications 6.8.1
- 2.8 Duke Power Company Radio Operator's Manual
- 2.9 Maintenance of Silver Zeolite Air Sampling Cartridges Letter; File: CN-768.01
- 2.10 10CFR 50 Appendix E
- 2.11 Technical Manual for Groban Gasoline Generators

3.0 LIMITS AND PRECAUTIONS

- 3.1 Operation of Portable Generators
 - 3.1.1 Avoid operating the unit while hands are wet or while standing in water.
 - 3.1.2 Generators shall not be started while equipment is plugged into generator.
- 3.2 Silver zeolite cartridges shall be discarded if the seal has been broken.

- 3.3 Any radiation monitoring equipment (located in an emergency kit) that must be removed from service for any reason shall be replaced within four hours from the time it is removed from the kit.
- 3.4 Any emergency kit used during training or for drill purposes shall be reinventoried as soon as possible. The individual responsible for the training or drill shall be responsible for inventory and restocking of all on-site kits.
 - 3.4.1 Off-site kits shall be reinventoried as above and a list of deviations shall be given to the Respiratory/Instrument Calibration (R/IC) Supervisor. R/IC shall be responsible for restocking off-site kits as soon as possible.

4.0 PROCEDURE

4.1 Monthly Emergency Equipment Check/Inventory

4.1.1 Portable Generator Check

- 4.1.1.1 Portable generators shall be considered acceptable for use if:

- 4.1.1.1.1 The oil level is at an acceptable level per Reference 2.11.

- 4.1.1.1.2 The generator starts and runs for at least 5 minutes.

- 4.1.1.1.3 The generator stabilizes after a portable air sampler is plugged into each of the generator outlets.

- 4.1.1.2 If generator is acceptable, shut off generator and remove any excess gasoline from the gas tank.

- 4.1.1.3 Document the operability of the generators in the appropriate column on the Monthly/Quarterly Emergency Equipment Check Sheet (Enclosure 5.1).

4.1.2 Two-Way Low Band FM Radios

- 4.1.2.1 The radios shall be considered acceptable for use if:

- 4.1.2.1.1 Each radio transmits a message to another radio.

- 4.1.2.1.2 Each radio receives a message from another radio.

- 4.1.2.2 Document the operability of the radios in the appropriate area on Enclosure 5.1.

- 4.1.2.3 Inoperable radios shall be removed from service. Contact Toddville Communication Shop Planner for instructions on disposition for repair.

4.1.3 Batteries

- 4.1.3.1 All batteries shall be considered acceptable for use if:
 - 4.1.3.1.1 The battery tester needle indicates "good" when the battery is tested.
 - 4.1.3.1.2 The battery appears to be in good physical condition (no dents, corrosion, etc.).
- 4.1.3.2 Document battery check on Enclosure 5.1.

4.1.4 Portable Survey Instruments

- 4.1.4.1 Portable Survey Instruments shall be considered acceptable for use if:
 - 4.1.4.1.1 The instrument battery checks.
 - 4.1.4.1.2 The instrument source checks in accordance with the instrument's operation procedure (located in the emergency kit).
 - 4.1.4.1.3 The instrument has no apparent physical damage.
 - 4.1.4.1.4 The instrument's calibration date is current.
- 4.1.4.2 Document the instrument's operability on Enclosure 5.1.

4.1.5 Portable Air Samplers

- 4.1.5.1 Air Samplers shall be considered acceptable for use if:
 - 4.1.5.1.1 The sampler operates when plugged into an electrical outlet.
 - 4.1.5.1.2 The calibration date on the sampler is current.
 - 4.1.5.1.3 The sampler has no apparent physical damage.

4.1.5.2 Document the sampler s operability on Enclosure 5.1.

4.1.6 Respiratory Equipment

4.1.6.1 Respiratory equipment shall be considered acceptable for use if:

4.1.6.1.1 The equipment is in accordance with criteria stated in Reference 2.1.

4.1.6.1.2 The Emergency Self-Contained Breathing Apparatus (SCBA) are available at the following locations:

<u>Locations</u>	<u>Minimum Units</u>
Control Room	2
Upper Personnel Hatch	2
Lower Personnel Hatch	2
Health Physics Respiratory Storage Area	8

4.1.6.1.3 Six large cylinders of breathing air (minimum of six hours used for 5 people) are located in the Control Room along with 5 airline respirators and associated airline hoses.

4.1.6.2 Document operability of respiratory equipment in accordance with Reference 2.1.

4.2 Quarterly Emergency Equipment Inventory/Inspection

4.2.1 Emergency equipment kits shall be inventoried quarterly and after each use using the appropriate Emergency Equipment Kit Checklist (Enclosures 5.4 - 5.13)

4.2.1.1 Consult the Emergency Equipment Kit Location Sheet (Enclosure 5.2) for the locations of each kit.

4.2.1.2 Perform monthly checks as in Steps 4.1.1, 4.1.3, 4.1.4, 4.1.5, 4.1.6.

4.2.1.3 The quarterly operability check on two-way low band radios shall be performed as follows:

4.2.1.3.1 Radios shall be checked from a point 10 miles from the plant in accordance with Reference 2.8.

- 4.2.1.3.2 Contact shall be made from the base station in the TSC to each of the radios.
- 4.2.1.3.3 Each of the radios shall make contact with the base station.

NOTE: Base Call Sign -

Radio Call Signs -
(Alpha, Bravo, Charlie,
Delta, Echo, Foxtrot)

- 4.2.1.3.4 Document operability of radios on Enclosure 5.1.
- 4.2.1.4 Perform a functional check of the dosimeter charger/reader. The charger is acceptable for use if the charger light illuminates.
- 4.2.1.5 Ensure that the leak and source check dates on the dosimeters are current.
- 4.2.1.6 Ensure that the TLD's are the appropriate ones for the current quarter.
- 4.2.1.7 Ensure the Potassium Iodide tablets have not exceeded their expiration date.
- 4.2.1.8 Ensure the seal on the silver zeolite cartridge packet is not broken and the cartridges are not damaged.
- 4.2.1.9 Ensure that all procedures are current with the Control Copy.
- 4.2.1.10 Ensure the flashlight bulb illuminates properly.
- 4.2.1.11 Check all protective clothing for tears, rips or holes, cracks in rubber, missing snaps, broken zippers, etc.
- 4.2.1.12 If any deviations are found, they shall be noted in the deviation section of the applicable Emergency Equipment Kit Checklist (Enclosure 5.4 - 5.13).
 - 4.2.1.12.1 Give a brief description of the deviation in this section.
- 4.2.1.13 Document any deviations on the Emergency Equipment Deviation Authorization Sheet (Enclosure 5.14).

4.2.1.14 The Technician shall sign off Enclosure 5.1 and the appropriate checklists (Enclosures 5.4 - 5.13) and forward to the Respiratory/Instrument Calibration (R/IC) Supervisor.

4.2.2 Weather Information Check

4.2.2.1 Quarterly a call shall be placed to the National Weather Service located in Columbia, SC at [REDACTED] If these numbers cannot be reached, an alternate number in Charlotte [REDACTED] may be used. Obtain wind direction, wind speed, and cloud cover from one of these sources for the vicinity of Catawba Nuclear Station.

4.2.2.2 Obtain the same information from the Control Room.

4.2.2.3 Record this information on the Weather Information Form (Enclosure 5.3).

4.3 Deviation Authorization

4.3.1 The Station Health Physicist shall be made aware of any deviation recorded on Enclosure 5.14.

4.3.2 The Station Health Physicist shall have evaluated the consequences the deviation may have upon the capability to respond to an emergency situation.

4.3.3 Enclosure 5.14 shall be used to state the action taken to remedy the deviation, and to state the justification for taking that action.

4.4 Upon completion of this procedure all required documentation will be filed in the Emergency Equipment Functional Check and Inventory Log, until the end of the quarter.

4.4.1 At the end of the quarter all of the required documentation will be placed in the Health Physics Satellite Master File.

4.4.2 Sign off the PT printout and forward as per Reference 2.4.

5.0 ENCLOSURES

5.1 Sample of Monthly /Quarterly Emergency Equipment Check Sheet

5.2 Sample of Emergency Equipment Kit Location Sheet

5.3 Sample of Weather Information Form

5.4 Sample of Recovery Kit Checklist

- 5.5 Sample of Environmental Survey Kit Checklist
- 5.6 Sample of Environmental Survey Kit Checklist (Helicopter)
- 5.7 Sample of Personnel Survey Kit Checklist
- 5.8 Sample of Personnel Survey Kit Checklist (Evacuation Facility)
- 5.9 Sample of Emergency Medical Kit Checklist (First Aid Room)
- 5.10 Sample of Emergency Medical Kit Checklist (Piedmont Medical Center)
- 5.11 Sample of Operations Support Center Kit Checklist
- 5.12 Sample of Technical Support Center Kit Checklist
- 5.13 Sample of Fuel Transfer Kit Checklist
- 5.14 Sample of Emergency Equipment Deviation Authorization Sheet

(

[illegible]

CATAWBA NUCLEAR STATION
AGENCY EQUIPMENT LOCATION SHEET
HP/O/B/1000/06
ENCLOSURE 5.2

KITS

LOCATION

Recovery Kits (4)
Evacuation Facilities (2)

Security Pap Area
Construction Personnel Access Area

Environmental Survey Kits (Vehicle) (4)
Environmental Survey Kit (Helicopter) (1)

Personnel Survey Kits (4)
Evacuation Facilities (2)

Security Pap Area
Construction Personnel Access Area

Emergency Medical Kit (2)

Operations Support Center Kit

Technical Support Center Kit

Fuel Transfer Kit

Allen Steam Station
Transmission Line
Maintenance Building
Temp. Admin. Building
Temp. Admin. Building

Temp. Admin. Building
Temp. Admin. Building

Allen Steam Station
Transmission Line
Maintenance Building
Temp. Admin. Building
Temp. Admin. Building

Aux. Building First Aid Room
Piedmont Medical Center

Operations Support Center

Technical Support Center

Temp. Admin. Building

CATAWBA NUCLEAR STATION
WEATHER INFORMATION
HP/O/B/1000/06
ENCLOSURE 5.3

	National Weather Service	Control Room
Wind Direction	_____	_____
Wind Speed	_____	_____
Cloud Cover	_____	_____
Time	_____	_____

Signature/Date

CATAWBA NUCLEAR STATION
RECOVERY KITS CHECKLIST
HP/O/B/1000/06
ENCLOSURE 5.4

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	_____
Eberline E-520 w/HP-270 Probe	1	_____
Exempt Source	1	_____
Low/High Range Dosimeters (0-500 mR), (0-5R)	2 each	_____
Dose Cards	25	_____
TLD Badges	6	_____
Dosimeter Charger	1	_____
Boundary Ribbon or Rope (50 yd. roll)	1	_____
Masking Tape (roll)	1	_____
Rain Suits (set)	2	_____
Protective Clothing (set)	2	_____
Poly Bags (Various)	12	_____
Caution Signs w/inserts	2	_____
Legal Pad	1	_____
Instrument/Smear Survey (pad)	1	_____
Pens	2	_____
Grease Pencil	1	_____
Full Face Respirator With High Efficiency Filters	2	_____
First Aid Kit	1	_____
Potassium Iodide Tablets	275 bottles	_____
Trans. Line Maint.	150 bottles	_____
Security PAP	150 bottles	_____
Construction Personnel Area	275 bottles	_____
Allen Steam Station	100	_____
KI Distribution Data Sheet	1	_____
Smears (box)	30	_____
NuCon Smears	1	_____
Flashlight	10	_____
Batteries (Size D)	1	_____
Scissors	100	_____
Medication Envelopes	60	_____
Trans. Line Maint.	60	_____
Security PAP	100	_____
Construction Personnel Area	1	_____
Allen Steam Station	100	_____
Crisis Management Team Phone Directory**	3	_____
SLED Badges (Personnel and Vehicle each)**	1	_____
Emergency Planning Zone Maps**	1	_____
HP/O/B/1009/16		_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviations will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

**These items are found only in the Recovery Kits located at Allen Steam Station and Transmission Line Maintenance Building.

CATAWBA NUCLEAR STATION
 ENVIRONMENTAL SURVEY KITS CHECKLIST
 HP/O/B/1000/06
 ENCLOSURE 5.5

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	
Eberline E-520 w/HP-270 Probe	1	
Eberline E-140N w/HP-210 Probe (or equivalent)	1	
Exempt Source	1	
Portable MCA**	1	
Eberline PIC 6A	1	
Emergency Radio Transmitter/Receiver	1	
Radeco H809V Air Sampler	1	
Gasoline Generator (Gasoline in Safety Cabinet)	1	
Low/High Range Pocket Dosimeter (0-500 mR), (0-5R)	2 each	
Dose Cards	25	
TLD Badge	6	
Dosimeter Charger	1	
Full Face Respirator With High Efficiency Filter	2	
Potassium Iodide Tablets (bottle)	2	
Protective Clothing (Full Set)	3	
Poly Bags (Various Sizes)	6	
Masking Tape (roll)	1	
Limnological Sampler	1	
Cubitainers	6	
1 Liter Wide Mouth Bottles	5	
Stopwatch	1	
Flashlight	1	
Batteries (Size D)	14	
Batteries (9 volt)	4	
Silver Zeolite (CP-100G or GY-130) Filter Cartridges and Particulate Filters	30	
Filter Cartridges Labels & Bags	100	
Smears (box)	1	
NuCon Smears	30	
Instrument/Smear Survey (pad)	1	
Map of Ten Mile Zone Sectors	1	
Legal Pad	1	
Pen	2	
Permanent Marker	1	
Hand Spade	1	
Grease Pencil and refills	1	
Dime Roll	1	
Scissors	1	
Rain Suits	3	
Telephone location maps	1	
Field Monitoring Data Sheet	20	
Field Monitoring Work Sheet	20	
KI Tablet Distribution Data Sheet	1	
Radio Operator Manual	1	
CPD1 Key	1	
Cotton Liners (pairs)	5	
SLED Badges (Personal - Vehicle)	4	
HP/O/B/1009/04	1	

CATAWBA NUCLEAR STATION
 ENVIRONMENTAL SURVEY KITS CHECKLIST
 HP/O/B/1000/06
 ENCLOSURE 5.5

ITEM	MINIMUM AMOUNT	DEV.*
HP/O/B/1009/16	1	_____
HP/O/B/1003/17	1	_____
HP/O/B/1009/19	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

 Signature/Date

*Any Deviations will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

**This instrument is stored and maintained in the Health Physics Counting Room Area.

(CATAWBA NUCLEAR STATION ()
 ENVIRONMENTAL SURVEY KITS CHECKLIST (Helicopter)
 HP/O/B/1000/06
 ENCLOSURE 5.6

ITEM	MINIMUM AMOUNT	DEV. *
List of Contents	1	_____
Eberline PIC-6A	1	_____
Eberline E-520 w/HP-270 Probe	1	_____
Exempt Source	1	_____
Low/High Range Pocket Dosimeter (0-500 mR), (0-5R)	2 each	_____
Dose Cards	25	_____
Field Monitoring Data Sheet	20	_____
TLD Badge	6	_____
Dosimeter Charger	1	_____
Full Face Respirator with High Efficiency Filter	2	_____
Potassium Iodide Tablets (bottle)	2	_____
KI Distribution Data Sheet	1	_____
Stopwatch	1	_____
Flashlight	1	_____
Batteries (Size D)	10	_____
Batteries (9 volt)	4	_____
Ear Plugs (pairs)	6	_____
Map of Ten Mile Zone Sectors	1	_____
Legal Pad	1	_____
Pen	2	_____
Rain Suits	2	_____
Instrument/Smear Survey (pad)	1	_____
Emergency Radio Transmitter/Receiver	1	_____
HP/O/B/1009/19	1	_____
HP/O/B/1009/04	1	_____
HP/O/B/1009/16	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

 Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

CATAWBA NUCLEAR STATION
PERSONNEL SURVEY KITS CHECKLIST
HP/O, B71000/06
ENCLOSURE 5.7

Page 1 of 2

ITEM	MINIMUM AMOUNT	DEV. *
List of Contents	1	_____
Eberline E-140N w/HP-210 Probe (or equivalent)***	2	_____
Sample Slide Tray***	1	_____
Exempt Source	1	_____
Emergency Radio Transmitter/Receiver**	1	_____
Radio Operator Manual	1	_____
Low/High Range Dosimeters (0-500 mR/hr), (0-5 R/hr)	2 each	_____
Dose Cards	25	_____
TLD Badges	2	_____
Dosimeter Charger	1	_____
Full Face Respirator With High Efficiency Filter	2	_____
Potassium Iodine Tablets (bottle)	2	_____
KI Distribution Data Sheet	1	_____
Protective Clothing (Full set)	6	_____
Boundary Ribbon or Rope (50 yd. roll)	1	_____
Caution Signs w/inserts	4	_____
Masking Tape (roll)	1	_____
Poly Bags (Various)	6	_____
Smears (box)	1	_____
NuCon Smears	25	_____
Instrument/Smear Survey (pad)	1	_____
Pens	2	_____
Grease Pencil & Refills	1	_____
Legal Pad	1	_____
Scissors	1	_____
Rain Suits	3	_____
Decon Kit	1	_____
1) Rad Con		_____
2) Rad Wash		_____
3) Paper Towels		_____
4) Scrub Brush		_____
5) Cotton Swabs		_____
6) Fingernail Clippers		_____
7) Phisohex (125 ml)		_____
8) Personal Decontamination Forms		_____
Batteries (Size D)	10	_____
Station Directive 3.8.3	1	_____
HP/O/B/1004/06	1	_____
HP/O/B/1009/05	1	_____
HP/O/B/1009/16	1	_____
HP/O/B/1009/19**	1	_____

CATAWBA NUCLEAR STATION
PERSONNEL SURVEY KITS CHECKLIST
HP/04B/1000/06
ENCLOSURE 5.7

Page 2 of 2

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

**Only the Construction Personnel access area shall have an Emergency Radio and procedure.

***The Security PAP Area shall have (3) E-140N w/HP-210 Probe or equivalent and Sample Slide Tray. The Construction Personnel Access Area shall have (2) E-140-N w/HP-210 Probe or equivalent and shall not have a Sample Slide Tray.

(CATAWBA NUCLEAR STATION (

PERSONNEL SURVEY KITS CHECKLIST
(EVACUATION FACILITY)
HP/O/B/1000/06
ENCLOSURE 5.8

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	
Eberline E-140N w/HP-210 Probe (or equivalent)	3	
Exempt Source	1	
Low/High Range Dosimeters (0-500 mR), (0-5R)	4 each	
Dose Cards	25	
TLD Badges	4	
Dosimeter Charger	1	
Potassium Iodide Tablets (bottle)	2	
KI Tablet Distribution Data Sheet	1	
Medication Envelopes	3	
Protective Clothing (Full Set)	6	
Boundary Ribbon or Rope (50 yd. roll)	1	
Caution Signs w/inserts	4	
Masking Tape (roll)	1	
Poly Bags (Various)	6	
Smears (box)	1	
Instrument/Smear Survey (pad)	1	
Pens	2	
Grease Pencil & Refills	1	
Legal Pad	1	
Decon Kit	1	
1) Rad Con		
2) Rad Wash		
3) Paper Towels		
4) Scrub Brush		
5) Cotton Swabs		
6) Fingernail Clippers		
7) PhisoHex (125 ml)		
8) Personnel Decontamination Forms		
Scissors	1	
Disposable Coveralls	40	
Station Directive 3.8.3	1	
Evacuation Personnel Dose Record	50	
Catawba Nuclear Station Telephone Directory	1	
Batteries (Size D)	10	
HP/O/B/1004/06	1	
HP/O/B/1009/05	1	
HP/O/B/1009/16	1	

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

(CATAWBA NUCLEAR STATION (

EMERGENCY MEDICAL KIT CHECKLIST

FIRST AID ROOM

HP/O/B/1000/06

ENCLOSURE 5.9

ITEM	MINIMUM AMOUNT	DEV. *
List of Contents	1	
Eberline E-140N w/HP-210 Probe (or equivalent)	1	_____
Exempt Source	1	_____
Poly Bags (various sizes)	6	_____
Smears (box)	1	_____
NuCon Smears	25	_____
Protective Clothing (Full Set)	4	_____
Rain Suits	2	_____
Tape, Radioactive Material	1	_____
Tape, Masking 2"	1	_____
Tape, Duct 2"	1	_____
Instrument/Smear Survey (pad)	1	_____
Pens	2	_____
Legal Pad	1	_____
Caution Signs w/inserts	3	_____
Radioactive Material Tags	50	_____
Scissors	1	_____
Poly for Ambulances (bundles)	3	_____
Protective Clothing for Ambulance Drivers (Sets)	2	_____
Batteries (Size D)	4	_____
HP/O/B/1004/06	1	_____
HP/O/B/1009/08	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

(CATAWBA NUCLEAR STATION (

EMERGENCY MEDICAL KITS CHECKLIST

PIEDMONT MEDICAL CENTER

HP/04B/1000/06

ENCLOSURE 5.10

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	_____
Eberline E-520 w/HP-270 Probe	1	_____
Eberline E-140N W/210 Probe (or equivalent)	1	_____
Exempt Source	1	_____
Poly Bags (various sizes)	14	_____
Smears (box)	1	_____
NuCon Smears	25	_____
Tape, Radioactive Material	1	_____
Tape, Masking 2"	2	_____
Tape, Duct 2"	4	_____
Instrument/Smear Survey (pad)	1	_____
Caution Signs w/inserts	5	_____
Rad Rope	1	_____
TLD Badges	10	_____
Pocket Dosimeters (0-500mR) *	10	_____
Dose Cards	25	_____
Dosimeter Charger	1	_____
Radioactive Material Tags	50	_____
Floor and Vent Covering	1	_____
Disposable Coveralls	25	_____
Disposable Shoe Covers (pairs)	25	_____
Disposable Hoods	10	_____
Cubitainers	5	_____
Decon Kit	1	_____
1) Rad Con		
2) Rad Wash		
3) Paper Towels		
4) Scrub Brush		
5) Cotton Swabs		
6) Fingernail Clippers		
7) Phisohex (125 ml)		
8) Personnel Decontamination Forms		
Cotton Gloves (pairs)	50	_____
Rubber Gloves (pairs)	20	_____
Batteries (Size D)	8	_____
Grease pencils (box)	1	_____
HP/0/B/1004/06	1	_____
HP/0/B/1009/08	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

CATAWBA NUCLEAR STATION
OPERATIONS SUPPORT CENTER KITS CHECKLIST
HP/O/E/1000/06
ENCLOSURE 5.11

Page 1 of 2

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	_____
Protective Clothing (Set)	40	_____
Full Face Respirators with High Efficiency Filters	10	_____
Flashlights	11	_____
Batteries (Size D)	34	_____
Batteries (9 volt)	20	_____
Eberline PIC 6A	5	_____
RM-14 w/HP-210 Probe	1	_____
E-140N w/HP-210 Probe (or equivalent)	1	_____
Exempt Source	1	_____
Camera (Polaroid)	1	_____
Polaroid Film Paks	2	_____
Masking Tape (Roll)	2	_____
Dosimeters (O-100R), (O-5R)	5	_____
Dose Cards	25	_____
Dosimeter Charger	1	_____
Small Sample Bottles or Medication Envelopes	10	_____
Rain Suits	5	_____
Poly Bags (various sizes)	50	_____
Radeco H809V Air Sampler	3	_____
Silver Zeolite (CP-100G or GY-130) Filter Cartridges and Particulate Filters	30	_____
Filter Cartridge Labels	30	_____
Potassium Iodide Tablets (bottle)	20	_____
KI Distribution Data Sheet	10	_____
HP/O/B/1004/06	1	_____
Decon Kit	1	_____
1) Rad Con		
2) Rad Wash		
3) Paper Towels		
4) Scrub Brush		
5) Cotton Swabs		
6) Fingernail Clippers		
7) Phisoex (125 ml)		
8) Personnel Decontamination Forms		
Instrument/Smear Survey (pad)	1	_____
Telephone	2	_____
Post-Accident Containment Air Sampling Equipment Kit	1	_____
Pen (box)	1	_____
Grease Pencil (and refills) (box)	1	_____
Extension Cord (50 ft.)	2	_____
Extension Cords (25 ft.)	2	_____
Stopwatch	2	_____
Large Battery Lanterns	4	_____
Plant Drawings	1	_____

CATAWBA NUCLEAR STATION
OPERATIONS SUPPORT CENTER KITS CHECKLIST
HP/O/P/1000/06
ENCLOSURE 5.11

Page 2 of 2

ITEM	MINIMUM AMOUNT	DEV.*
OSC Response Personnel Dose Record Forms	125	_____
Smears (box)	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.1.4, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	
Protective Clothing (Set)	20	
Full Face Respirators with High Efficiency Filters	6	
Eberline E-520 w/HP-270 Probe	1	
Eberline PIC-6A	3	
E-140N w/HP-210 Probe (or equivalent)	1	
Exempt Source	1	
Radeco H809V Air Sample	1	
Dosimeter (0-100R), (0-5R)	6 each	
Dose Cards	25	
Silver Zeolite (CP-100G or GY-130) Filter Cartridges and Particulate Filters	30	
Filter Cartridge Labels	25	
Dosimeter Charger	1	
Potassium Iodide Tablets (bottle)	25	
Boundary Ribbon or Rope (50 yd. roll)	1	
Caution Signs w/inserts	3	
Rad Tape	2	
Smears (box)	1	
Poly Bags	6	
Masking Tape (Roll)	1	
Pen	2	
Legal Pad	1	
Grease Pencil (and refills)	1	
Flashlights	8	
Batteries (Size D)	30	
Batteries (9V)	12	
Small Sample Bottles or Medication Envelopes	10	
Rain Suits	6	
Decon Kit	1	
1) Rad Con		
2) Rad Wash		
3) Paper Towels		
4) Scrub Brush		
5) Cotton Swabs		
6) Fingernail Clippers		
7) Phisohex (125 ml)		
8) Personnel Decontamination Forms		
Instrument/Smear Survey (pad)	1	
Request for Exposure Extension Forms	15	
Plant Drawings	1	
HP/O/B/1009/16	1	
HP/O/B/1004/06	1	

CATAWBA NUCLEAR STATION
TECHNICAL SUPPORT CENTER KIT CHECKLIST
HP/02/1000/06
ENCLOSURE 5.12

Page 2 of 2

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

CATAWBA NUCLEAR STATION
FUEL TRANSFER KIT CHECKLIST
HP/O/B/1000/06
ENCLOSURE 5.13

ITEM	MINIMUM AMOUNT	DEV.*
List of Contents	1	_____
Shoe Covers: disposable (pair)	20	_____
rubber (Pair)	6	_____
Gloves: disposable (bundle)	1	_____
surgeons (box)	1	_____
rubber (pair)	6	_____
Coveralls: disposable	4	_____
cloth	6	_____
Hoods	4	_____
Wet Suit	2	_____
Hard Hat	3	_____
Full Face Respirators with High Efficiency Filters	2	_____
Radeco H809V Air Sampler	1	_____
Eberline E-140N w/HP-210 Probe (or equivalent)	1	_____
Eberline PIC-6A	1	_____
Eberline E-520 w/HP-270 Probe	1	_____
Exempt Source	1	_____
Silver Zeolite Cartridges and Particulate Filters	10	_____
Labels for Filters and Cartridges	10	_____
Potassium Iodide Tablets (Bottle)	30	_____
TLD Badge	5	_____
Low/High Range Dosimeter (0-500 mR), (0-5R)	5 each	_____
Dose Card	25	_____
Dosimeter Charger	1	_____
Weather-Proof Caution Signs with Inserts	4	_____
Radioactive Waste Signs (4" x 6")	12	_____
Caution: Radiation/Radioactive Material Tags	12	_____
50 yd. Roll of Barricade Tape (Magenta & Yellow)	4	_____
Step Off Pads	3	_____
Poly Bags	12	_____
Hand Gardening Spade	1	_____
Wide Mouth Sample Bottles	4	_____
Plastic Sample Bottles or Medication Envelopes	12	_____
Kimwipes (box)	2	_____
NuCon Swears	100	_____
Copy of NAC-1 Drawings (Prints)	1	_____
Copy of Loading and Unloading Instructions	1	_____
Duct Tape (Roll)	2	_____
Masking Tape (1" and 2" Rolls)	1 each	_____
Contact Pyrometer with Probe	2	_____
Safety Glasses	5	_____
Binoculars	1	_____
Tool Kit	1	_____
Batteries (9 Volt)	4	_____
Flashlights	2	_____
Batteries (Size D)	18	_____
Steno Pad with 2 Mechanical Lead Pencils	1	_____
Pencil Refills	1	_____

CATAWBA NUCLEAR STATION
FUEL TRANSFER KIT CHECKLIST
HP/O/B/1000/06
ENCLOSURE 5.13

ITEM	MINIMUM AMOUNT	DEV.*
Grease Pencils	2	_____
All Purpose Marker	2	_____
Scotch Tape Roll and Dispenser	1	_____
Roll of Dimes	1	_____
Gasoline Generator (Gasoline Stored in Safety Cabinet)	1	_____
Instrument/Smear Survey (pad)	1	_____
HP/O/B/1009/16	1	_____

This Kit has been inventoried and Steps 4.2.1.4 through 4.2.1.14, if applicable, have been completed.

Signature/Date

*Any Deviation will be documented on the Emergency Equipment Deviation Authorization Sheet (Sample Enclosure 5.14).

EMERGENCY EQUIPMENT DEVIATION AUTHORIZATION SHEET

[illegible]

R/C Supervisor _____ Date _____
Station Health Physicist _____ Date _____



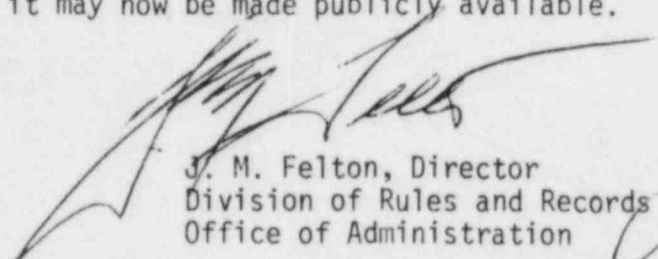
UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 1, 1984

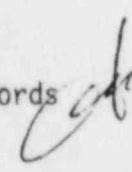
50-414/413 Catawba

MEMORANDUM FOR: Chief, Document Management Branch, TIDC
FROM: Director, Division of Rules and Records, ADM
SUBJECT: REVIEW OF UTILITY EMERGENCY PLAN DOCUMENTATION

The Division of Rules and Records has reviewed the attached document and has determined that it may now be made publicly available.



J. M. Felton, Director
Division of Rules and Records
Office of Administration



Attachment: As stated

DUKE POWER COMPANY

P.O. BOX 33189

CHARLOTTE, N.C. 28242

HAL B. TUCKER

VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

February 26, 1985

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

Re: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

Dear Sir:

Enclosed for NRC Staff use and review are two copies of the latest revision to the following Catawba Nuclear Station Emergency Plan Implementing Procedures:

- | | |
|-------------------|--------------------|
| 1) RP/O/A/5000/02 | 7) HP/O/B/1009/13 |
| 2) RP/O/A/5000/03 | 8) HP/O/B/1009/14 |
| 3) RP/O/A/5000/04 | 9) HP/O/B/1009/15 |
| 4) RP/O/A/5000/05 | 10) OP/O/A/6200/21 |
| 5) RP/O/A/5000/13 | 11) HP/O/B/1000/06 |
| 6) HP/O/B/1009/04 | |

Please delete privacy material in the form of personal telephone numbers prior to placing any material in the public document room, specifically:

- 1) RP/O/A/5000/02, Enclosure 4.1
- 2) RP/O/A/5000/03, Enclosure 4.1
- 3) RP/O/A/5000/04, Enclosure 4.1
- 4) RP/O/A/5000/05, Enclosure 4.1
- 5) RP/O/A/5000/13, Section 3.3
- 6) HP/O/B/1009/04, Enclosure 5.8

These revisions are being submitted in accordance with 10 CFR 50.54(q) and do not decrease the effectiveness of the Emergency Plan Implementing Procedures.

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Document Control Desk
February 26, 1985
Page -Two-

By copy of this letter, one copy of each of the above documents is being provided to the NRC, Region II.

Very truly yours,

H.B. Tucker

Hal B. Tucker

RWO:slb

Enclosures

cc: w/enclosures
Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
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Atlanta, Georgia 30323

w/o enclosures
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Catawba Nuclear Station

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