



**Kelvin Henderson**  
Vice President  
Catawba Nuclear Station

**Duke Energy**  
CNO1VP | 4800 Concord Road  
York, SC 29745

o: 803.701.4251  
f: 803.701.3221

CNS-16-024

March 31, 2016

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

SUBJECT: Duke Energy Carolinas, LLC  
Catawba Nuclear Station Units 1 and 2  
Docket Nos.: 50-413 and 50-414  
Emergency Plan, Revision 16-1

Enclosed for NRC staff use is Revision 16-1 to the Catawba Nuclear Station Emergency Plan. All changes have been specifically highlighted (side-barred). This revision is effective on March 31, 2016.

This revision is being submitted in accordance with 10CFR50.54 (q) and is not a reduction in the effectiveness of the Emergency Plan. The 10CFR50.54 (q) Evaluation is provided as Attachment 1.

By copy of this letter, two copies of this document are being provided to the NRC, Region II.

If there are any questions, please call Tom Arlow at (803) 701-4027.

Very truly yours,

Kelvin Henderson  
Vice President, Catawba Nuclear Station

Attachments:

1. 10CFR50.54 (q) Evaluation
2. Plan Update Instructions
3. Emergency Plan Revision 16-1

AX45  
NRR

U. S. Nuclear Regulatory Commission  
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Page Two

xc: (with attachments)

Catherine Haney, Regional Administrator  
U.S. Nuclear Regulatory Commission - Region II  
Marquis One Tower  
245 Peachtree Center Ave., NE Suite 1200  
Atlanta, GA 30303-1257

xc: (w/o attachments)

J.A. Whited  
NRC Project Manager (CNS)  
U.S. Nuclear Regulatory Commission  
One White Flint North, Mail Stop 8 B1A  
11555 Rockville Pike  
Rockville, MD 20852-2738

G.A. Hutto III  
Senior Resident Inspector (CNS)  
U.S. Nuclear Regulatory Commission  
Catawba Nuclear Site

March 31, 2016

MEMORANDUM

TO: All Holders of the Catawba Nuclear Station Emergency Plan

Subject: Catawba Nuclear Station Emergency Plan  
Revision 16-1

Enclosed is Catawba Nuclear Station Emergency Plan Revision 16-1. Plan Update Instructions are provided for incorporating this revision into the Catawba Nuclear Station Emergency Plan.

If you have any questions, please call me at 803-701-4027.

Sincerely,

A handwritten signature in cursive script, appearing to read "Tom Arlow", with a long horizontal flourish extending to the right.

Tom Arlow  
Emergency Preparedness Manager  
Catawba Nuclear Station

**Catawba Nuclear Station  
Emergency Plan Revision 16-1  
Attachment 1  
10CFR50.54(q) Evaluation**

10 CFR 50.54(q) Screening Evaluation Form

Screening and Evaluation Number		Applicable Sites	
EREG #: 02012968	BNP	<input type="checkbox"/>	
	CNS	<input checked="" type="checkbox"/>	
	CR3	<input type="checkbox"/>	
	HNP	<input type="checkbox"/>	
5AD #: 02012987	MNS	<input type="checkbox"/>	
	ONS	<input type="checkbox"/>	
	RNP	<input type="checkbox"/>	
	GO	<input type="checkbox"/>	
Document and Revision Catawba Emergency Plan Rev. 147		Section A, B, C, F, H, N, and Appendix 5.	
<p>Part I. Description of Activity Being Reviewed (event or action, or series of actions that may result in a change to the emergency plan or affect the implementation of the emergency plan):</p> <p>Updated A.1.a Organization Private Sector from "Bell South Telephone Company" to "AT&amp;T" due to change in company name.</p> <p>Updated Figure B-1a, Minimum on-shift ERO staffing requirements for emergencies, Emergency position "Non-Licensed Operator (NLO)" to "Auxiliary Operator (AO)" to match the title of that position in Operations department.</p> <p>Updated B.9.b Early Warning or Evacuation of the Populace from "North Carolina Department of Crime Control and Public Safety (Raleigh, NC)" to "North Carolina Department of Public Safety" due to change in department name.</p> <p>Deleted Note for B.9.h "NOTE: Summary written agreements with the agencies that have various responsibilities for emergency preparedness support and for emergency response in the public domain are included in the Appendix 5."</p> <p>Updated C.1.a procedure reference from "SH/0/B/2005/002" to "AD-EP-ALL-0203" due to SH/0/B/2005/002 being superseded by fleet procedure AD-EP-ALL-0203 for field monitoring.</p> <p>C.1.b deleted first sentence "The Agreement letter between Duke Energy and DOE - Savannah River is found in Appendix 5." since Agreement letters were removed from the emergency plan in revision 146.</p> <p>Change F.1.b. Communications With State/Local Governments second paragraph from:</p> <p>Three telephone lines to N.C. and S.C. are dedicated for specific tasks.</p> <ul style="list-style-type: none"> <li>- EOF Director to the state director at the SERT via the Decision Line</li> <li>- Off-Site Agency Communicator to state emergency management via DEMNET system.</li> <li>- State Public Information Officer (PIO) at the Joint Information Center to the State PIO at the N.C. State Emergency Response Team (SERT).</li> </ul> <p>Three telephone lines to N.C. and S.C. are dedicated for specific tasks.</p>			

**10 CFR 50.54(q) Screening Evaluation Form**

- EOF Director to the state director
- Off-Site Agency Communicator to state emergency management via DEMNET system.
- State Public Information Officer (PIO) at the Joint Information Center to the State PIO at the N.C. State Emergency Response Team (SERT).

Removed apostrophe from F.1.d for EOCs as an editorial correction.

Updated figure H-1 Technical Support Center (TSC), H-2 Operations Support Center (OSC), and H-7 Joint information Center (JIC) to represent current layout as a result of remodeling facilities.

N.2.b Fire drills added procedure references AD-EG-ALL-1530 (Fire Brigade Training) and AD-EG-ALL-1531 (Selection, Care and Maintenance of Firefighting Ensembles).

Appendix 5 added summary of Agreement for agreements 1-9 and 11-22 as an enhancement to emergency plan.

## 10 CFR 50.54(q) Screening Evaluation Form

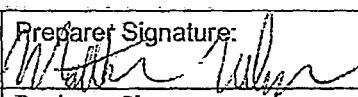
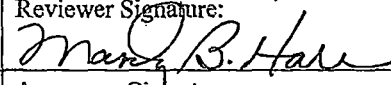
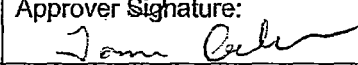
<b>Part II. Activity Previously Reviewed?</b> Is this activity Fully bounded by an NRC approved 10 CFR 50.90 submittal or Alert and Notification System Design Report?  If yes, identify bounding source document number or approval reference and ensure the basis for concluding the source document fully bounds the proposed change is documented below:  Justification:		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		10 CFR 50.54(q) Effectiveness Evaluation is not required. Enter justification below and complete Attachment 4, Part V.	Continue to Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part III
Bounding document attached (optional)		<input type="checkbox"/>	
<b>Part III. Editorial Change</b> Is this activity an editorial or typographical change only, such as formatting, paragraph numbering, spelling, or punctuation that does not change intent?  Removed apostrophe from F.1.d for EOCs as an editorial correction. EOCs included an apostrophe making EOCs possessive and not plural as intended in Section F.1.b. This is a punctuation change that does not change intent and as a result will not be evaluated any further.		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		10 CFR 50.54(q) Effectiveness Evaluation is not required. Enter justification and complete Attachment 4, Part V & VI.	Continue to Attachment 4, Part IV and address non editorial changes
<b>Part IV. Emergency Planning Element and Function Screen (Reference Attachment 1, Considerations for Addressing Screening Criteria)</b> Does this activity involve any of the following, including program elements from NUREG-0654/FEMA REP-1 Section II? If answer is yes, then check box.			
1	10 CFR 50.47(b)(1) Assignment of Responsibility (Organization Control)		
1a	Responsibility for emergency response is assigned.		<input checked="" type="checkbox"/>
1b	The response organization has the staff to respond and to augment staff on a continuing basis (24-7 staffing) in accordance with the emergency plan.		<input type="checkbox"/>
2	10 CFR 50.47(b)(2) Onsite Emergency Organization		
2a	Process ensures that onshift emergency response responsibilities are staffed and assigned		<input checked="" type="checkbox"/>
2b	The process for timely augmentation of onshift staff is established and maintained.		<input type="checkbox"/>
3	10 CFR 50.47(b)(3) Emergency Response Support and Resources		
3a	Arrangements for requesting and using off site assistance have been made.		<input checked="" type="checkbox"/>
3b	State and local staff can be accommodated at the EOF in accordance with the emergency plan. (NA for CR3)		<input type="checkbox"/>
4	10 CFR 50.47(b)(4) Emergency Classification System		
a	A standard scheme of emergency classification and action levels is in use. (Requires final approval of Screen and Evaluation by EP CFAM.)		<input type="checkbox"/>

**10 CFR 50.54(q) Screening Evaluation Form**

Part IV. Emergency Planning Element and Function Screen (cont.)		
5	10 CFR 50.47(b)(5) Notification Methods and Procedures	
5a	Procedures for notification of State and local governmental agencies are capable of initiating notification of the declared emergency within 15 minutes (60 minutes for CR3) after declaration of an emergency and providing follow-up notification.	<input type="checkbox"/>
5b	Administrative and physical means have been established for alerting and providing prompt instructions to the public within the plume exposure pathway. (NA for CR3)	<input type="checkbox"/>
5c	The public ANS meets the design requirements of FEMA-REP-10, Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants, or complies with the licensee's FEMA-approved ANS design report and supporting FEMA approval letter. (NA for CR3)	<input type="checkbox"/>
6	10 CFR 50.47(b)(6) Emergency Communications	
6a	Systems are established for prompt communication among principal emergency response organizations.	<input checked="" type="checkbox"/>
6b	Systems are established for prompt communication to emergency response personnel.	<input type="checkbox"/>
7	10 CFR 50.47(b)(7) Public Education and Information	
7a	Emergency preparedness information is made available to the public on a periodic basis within the plume exposure pathway emergency planning zone (EPZ). (NA for CR3)	<input type="checkbox"/>
7b	Coordinated dissemination of public information during emergencies is established.	<input checked="" type="checkbox"/>
	10 CFR 50.47(b)(8) Emergency Facilities and Equipment	
8a	Adequate facilities are maintained to support emergency response.	<input checked="" type="checkbox"/>
8b	Adequate equipment is maintained to support emergency response.	<input type="checkbox"/>
9	10 CFR 50.47(b)(9) Accident Assessment	
9a	Methods, systems, and equipment for assessment of radioactive releases are in use.	<input type="checkbox"/>
10	10 CFR 50.47(b)(10) Protective Response	
10a	A range of public PARs is available for implementation during emergencies. (NA for CR3)	<input type="checkbox"/>
10b	Evacuation time estimates for the population located in the plume exposure pathway EPZ are available to support the formulation of PARs and have been provided to State and local governmental authorities. (NA for CR3)	<input type="checkbox"/>
10c	A range of protective actions is available for plant emergency workers during emergencies, including those for hostile action events.	<input type="checkbox"/>
10d	KI is available for implementation as a protective action recommendation in those jurisdictions that chose to provide KI to the public.	<input type="checkbox"/>
11	10 CFR 50.47(b)(11) Radiological Exposure Control	
11a	The resources for controlling radiological exposures for emergency workers are established.	<input type="checkbox"/>
12	10 CFR 50.47(b)(12) Medical and Public Health Support	
12a	Arrangements are made for medical services for contaminated, injured individuals.	<input type="checkbox"/>
13	10 CFR 50.47(b)(13) Recovery Planning and Post-accident Operations	
13a	Plans for recovery and reentry are developed.	<input type="checkbox"/>



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Part IV. Emergency Planning Element and Function Screen (cont.)		
14	10 CFR 50.47(b)(14) Drills and Exercises	
14a	A drill and exercise program (including radiological, medical, health physics and other program areas) is established.	<input checked="" type="checkbox"/>
14b	Drills, exercises, and training evolutions that provide performance opportunities to develop, maintain, and demonstrate key skills are assessed via a formal critique process in order to identify weaknesses.	<input type="checkbox"/>
14c	Identified weaknesses are corrected.	<input type="checkbox"/>
15	10 CFR 50.47(b)(15) Emergency Response Training	
15a	Training is provided to emergency responders.	<input type="checkbox"/>
16	10 CFR 50.47(b)(16) Emergency Plan Maintenance	
16a	Responsibility for emergency plan development and review is established.	<input type="checkbox"/>
16b	Planners responsible for emergency plan development and maintenance are properly trained.	<input type="checkbox"/>
PART IV. Conclusion		
If no Part IV criteria are checked, a 10 CFR 50.54(q) Effectiveness Evaluation is not required, then complete Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part V. Go to Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part VI for instructions describing the NRC required 30 day submittal.		<input type="checkbox"/>
If any Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part IV criteria are checked, then complete Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part V and perform a 10 CFR 50.54(q) Effectiveness Evaluation. Shaded block requires final approval of Screen and Evaluation by EP CFAM.		<input checked="" type="checkbox"/>
Part V. Signatures:		
Preparer Name (Print): Matthew Nelson	Preparer Signature: 	Date: 3/22/16
Reviewer Name (Print): Mandy Hare	Reviewer Signature: 	Date: 3/22/16
Approver (EP Manager Name (Print): Tom Arlow	Approver Signature: 	Date: 3/22/16
Approver (CFAM, as required) Name (Print)	Approver Signature:	Date:
Part VI. NRC Emergency Plan and Implementing Procedure Submittal Actions		
Create two EREG General Assignments.		
• One for EP to provide the 10 CFR 50.54(q) summary of the analysis, or the completed 10 CFR 50.54(q), to Licensing.		<input checked="" type="checkbox"/>
• One for Licensing to submit the 10 CFR 50.54(q) information to the NRC within 30 days after the change is put in effect.		<input checked="" type="checkbox"/>

QA RECORD

## 10 CFR 50.54(q) Effectiveness Evaluation Form

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Three telephone lines to N.C. and S.C. are dedicated for specific tasks.			
<ul style="list-style-type: none"><li>- EOF Director to the state director</li></ul>			

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- Off-Site Agency Communicator to state emergency management via DEMNET system.
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N.2.b Fire drills added procedure references AD-EG-ALL-1530 (Fire Brigade Training) and AD-EG-ALL-1531 (Selection, Care and Maintenance of Firefighting Ensembles).

Appendix 5 added summary of Agreement for agreements 1-9 and 11-22 as an enhancement to emergency plan.

Attachment 6, 10 CFR 50.54(q) Initiating Condition (IC) and Emergency Action Level (EAL) and EAL Bases Validation and Verification (V&V) Form, is attached (required for IC or EAL change)

Yes ☐  
No ☒

**Part II. Description and Review of Licensing Basis Affected by the Proposed Change:**Licensing Basis:***Catawba Emergency Plan, Revision 146, May 2015*****A. Assignment of Responsibility (10 CFR 50.47(b)(1))****Planning Objective**

To assure that State, Local, Federal, private sector, Duke Energy Corporate and Catawba Nuclear Station organizations that are part of the overall response organization within the Catawba Emergency Planning Zone are identified.

**B. Site Emergency Organization (10 CFR 50.47(b)(2))****B.5 Minimum Staffing Requirements**

The positions, title and major tasks to be performed by the persons assigned to the functional areas of emergency activity at the station are described in Emergency Plan Implementing Procedures. These assignments shall cover the emergency functions in Figure B-1 (a and b). The minimum on-shift staffing reflective of two units in operation is as indicated in Figure B-1a. The capability to augment on-shift resources after declaration of an emergency is as indicated in Figure B-1b. The functional tasks to be performed by persons assigned to the areas of emergency activity are as designated in Emergency Plan Implementing Procedures. A detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in Figure B-1a. See CNS-OSSA-12212012 Rev: 0.

**B.9 Local Agency Support Services**

State, local and county agencies responsible for public health and safety work through the Emergency Preparedness Agency's Emergency Operations Center in the affected county until the State Emergency Response Team establishes its headquarters; Mecklenburg and Gaston Counties, North Carolina; York Municipal-County Emergency Preparedness Agency, York County, South Carolina. The EOF coordinates with the agencies necessary to support the emergency condition. Agencies that have agreed to provide support, as necessary to Catawba

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Nuclear Station and surrounding areas, are listed below: (Agreement Letters in Appendix 5)

**C. Emergency Response Support and Resources (10 CFR 50.47(b)(3))**

**C.1.a. Individuals Authorized to Request Federal Assistance**

Environmental radiological measurements are made in the field by radiological survey teams described in SH/O/B/2005/002. This information is used by the Radiological Assessment Manager to confirm environmental projections of doses and dose rates. If necessary to relieve Duke personnel, environmental surveillance support personnel from the DOE Radiological Assistance Plan may be requested by the Radiological Assessment Manager or the EOF Director.

**C.1.b. Federal Resources - Arrival Time**

The Agreement letter between Duke Energy and DOE - Savannah River is found in Appendix 5. DOE emergency radiological assistance is expected within 3 to 4 hours from a call for these services at Catawba. (Driving and set up time - does not consider use of helicopter or other aerial means of transport).

NRC's full team from Region 2 would be on-site within 7-8 hours from declaration of an emergency at Catawba. Some portions of their team could arrive on-site much earlier by the use of helicopter transport from Atlanta.

**F. Emergency Communications (10 CFR 50.47(b)(6))**

**F.1.b. Communications With State/Local Governments**

There are four means of contacting states/counties in the 10 mile EPZ.

(1) The DEMNET System is the primary means of communication. DEMNET is a network of Ethernet phones housing small computers and a touch screen displays which are used to initiate actions associated with the use of the Emergency Response Facilities (ERFs)(Control Rooms), Technical Support Centers (TSC), Emergency Operations Facilities (EOF), Simulator Control Rooms and alternate ERFs from each of Duke Energy's nuclear plants in North and South Carolina to communicate with required Offsite Response Organizations (OROs) and with each other.

(2) Standard telephone lines serve as a backup means of communication.

(3) Radio systems can be used for communication among off-site monitoring teams, counties, the control room, TSC and EOF.

(4) Satellite phone capability is also available in the Technical Support Center, Emergency Operations Facility and via a portable unit.

Three telephone lines to N.C. and S.C. are dedicated for specific tasks.

- EOF Director to the state director at the SERT via the Decision Line
- Off-Site Agency Communicator to state emergency management via DEMNET system.
- State Public Information Officer (PIO) at the Joint Information Center to the State PIO at the N.C. State Emergency Response Team (SERT).

**G. Public Information and Education (10 CFR 50.47(b)(7))**

**G.3.a Nuclear Communications - Location and Contacts**

Public information during a drill and/or emergency at Catawba Nuclear Station, will be coordinated and disseminated through the on-site media center located on Concord Road, York, S.C., or the Joint Information Center (JIC) (see Figure H-7) located in the Energy Center at 526 South Church Street, Charlotte, N.C. During the initial stages of an

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emergency situation, response to media questions relative to plant status will be provided at the on-site media center. The Charlotte media center (see Figure H-6), also located in the Energy Center, will be activated as needed. The news release will indicate the location of the primary media center. The news manager and public spokesperson are the primary contacts for the news media.

If the Emergency Operations Facility (EOF) is not activated, the normal Duke Energy news release process is followed. If the EOF is activated, then Nuclear Communications will activate the JIC and implement the Standard Procedure for Nuclear Communications Response to the Emergency Operations Facility (SR/O/A/2000/001) and the Nuclear Communications Emergency Response Plan (RP/O/B/5000/028) for gathering and disseminating information.

#### H. Emergency Facilities and Equipment (10 CFR 50.47(b)(8))

H.1.b Technical Support Center. (Figure H-1) The Technical Support Center (TSC) is utilized for evaluation of plant status by knowledgeable plant, vendor, NRC and other support groups during an emergency. This center will also be utilized to direct the on-site and initial off-site aspects of an emergency. Anticipated occupants are defined in RP/O/A/5000/020, Technical Support Center Activation Procedure. The TSC has the following capabilities:

1. Redundant two-way communications with the Control Room, the OSC, the Emergency Operations Facility and the Nuclear Regulatory Commission Operations Center. See Figure F-2 for communication scheme.
  2. Monitoring for direct radiation and airborne radioactive materials with local readout of radiation level and alarms if levels are exceeded.
  3. Display, printout or trend record of comprehensive data necessary to monitor reactor system status and to evaluate plant system abnormalities, in-plant and off-site radiological parameters and meteorological parameters are available. This capability is provided via the operator aid computer. Capabilities to access and display parameters, individually or in groups is provided.
  4. Ready access to as-built plant drawings such as general arrangements, flow diagrams, electrical one-lines, instrument details, etc.
  5. Radiological habitability during postulated radiological accidents to the same degree as the Control Room.
  6. Provisions for staffing by the Station Manager (Emergency Coordinator), advisors and representatives from the Station as necessary. Room is also provided for NRC personnel. Space for up to 35 persons plus instrumentation displays is provided.
- The TSC is located near the Control Room, on elevation 594, in the Service Building. The TSC is within two (2) minutes walking distance from the Control Room. This is a permanent facility.

H.1.c Operations Support Center. (Figure H-2) The Operations Support Center (OSC) is that place designated for Operations and Radiation Protection, Chemistry, Maintenance, IAE, and others as necessary, to report to in an emergency condition. This center will be used to brief and prepare station personnel for work assignments in support of the emergency condition. The OSC is located in the Service Building on the 609 elevation

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with the OCC. The OSC has adequate capacity and supplies including provisions for respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment and communications equipment. This is a permanent facility.

### H.2 Emergency Operations Facility (EOF)

The Emergency Operations Facility (EOF) is utilized for direction and control of all emergency and recovery activities with emphasis on the coordination of off-site activities such as communications with local, state and federal agencies, and coordination of corporate and other outside support. Anticipated occupants are the EOF organization and appropriate state and federal agency representatives.

The EOF has the following capabilities:

- The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves.
- The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensees and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves.
- The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site.

The Common EOF in Charlotte serves as an alternate facility that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and having the following characteristics required collectively of the alternate facilities for use when onsite emergency facilities cannot be safely accessed during hostile action:

- The capability for communication with the emergency operations facility, control room, and plant security.
- The capability to perform offsite notifications.
- The capability for engineering assessment activities, including damage control team planning and preparation.

The EOF has redundant two-way communications with the Technical Support Center and appropriate off-site support agencies. (See Section F)

The EOF is located in the Energy Center at 526 South Church Street, Charlotte, North Carolina. The EOF layout and location are shown on Figures H-3 through H-5.

### N. Exercises and Drills (10 CFR 50.47(b)(14))

N.2.b Fire drills shall be conducted in accordance with Nuclear System Directive (NSD) 112, Fire Brigade Organization, Training and Responsibilities.

### Appendix 5 Agreement Letters

This Appendix contains a list of written agreements between Duke Energy and other organizations that may be required to provide support to the Catawba Nuclear Station in the event of an onsite radiological emergency. The actual agreements are maintained on file by CNS Emergency Preparedness.

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**Part III. Description of How the Proposed Change Complies with Regulation and Commitments.**

If the emergency plan, modified as proposed, no longer complies with planning standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50, then ensure the change is rejected, modified, or processed as an exemption request under 10 CFR 50.12, Specific Exemptions, rather than under 10 CFR 50.54(q):

**Regulatory Basis**

**10 CFR 50.47(b)(1) states:** "Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis."

The applicable emergency planning functions associated with 10 CFR 50.47(b)(1) state:

- Responsibility for emergency response is assigned.
- The response organization has the staff to respond and to augment staff on a continuing basis (i.e., 24/7 support) in accordance with the emergency plan.

**The applicable supporting requirements described in 10 CFR 50, Appendix E.IV.A states:**

The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Specifically, the following shall be included:

1. A description of the normal plant operating organization.
6. A description of the local offsite services to be provided in support of the licensee's emergency organization.
7. By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.
8. Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.

**The applicable informing criteria described in NUREG-0654, Section II.A. states:**

- 1.a. Each plan shall identify the State, local, Federal and private sector organizations (including utilities), that are intended to be part of the overall response organization for Emergency Planning Zones.
- 2.a Each organization shall specify the functions and responsibilities for major elements and key individuals by title, of emergency response, including the following: Command and Control, Alerting and Notification, Communications, Public Information, Accident Assessment, Public Health and Sanitation, Social Services, Fire and Rescue, Traffic Control, Emergency Medical Services, Law Enforcement, Transportation, Protective Response (including authority to request Federal assistance and to initiate other protective actions), and Radiological Exposure Control. The description of these functions shall include a clear and concise summary such as a table of primary and support responsibilities using the agency as one axis, and the function as the other. (See Section B for licensee).

Each plan shall include written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the Emergency Planning Zones. The agreements shall identify the emergency measures to be provided and the mutually acceptable criteria for their implementation, and specify the arrangements for exchange of information.

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These agreements may be provided in an appendix to the plan or the plan itself may contain descriptions of these matters and a signature page in the plan may serve to verify the agreements. The signature page format is appropriate for organizations where response functions are covered by laws, regulations or executive orders where separate written agreements are not necessary.

**10 CFR 50.47(b)(2) states:** On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified.

The applicable emergency planning functions associated with 10 CFR 50.47(b)(2) state:

- The process ensures that onshift emergency response responsibilities are staffed and assigned.
- The process for timely augmentation of onshift staff is established and maintained.

**The applicable supporting requirements described in 10 CFR 50, Appendix E.IV.A states:**

2. A description of the onsite emergency response organization (ERO) with a detailed discussion of:
  - b. Plant staff emergency assignments;

**The applicable informing criteria described in NUREG-0654, Section II.B. states:**

1. Each licensee shall specify the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement.

5. Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1. The implementation schedule for licensed operators, auxiliary operators and the shift technical advisor on shift shall be as specified in the July 31, 1980 letter to all power reactor licensees. Any deficiencies in the other staffing requirements of Table B-1 must be capable of augmentation within 30 minutes by September 1, 1981, and such deficiencies must be fully removed by July 1, 1982.

**10 CFR 50.47(b)(3) states:** Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.

The applicable emergency planning functions associated with 10 CFR 50.47(b)(3) state:

- Arrangements for requesting and using offsite assistance have been made.
- State and local staff can be accommodated at the EOF in accordance with the emergency plan.

**The applicable supporting requirements described in 10 CFR 50, Appendix E.IV.A states:**

6. A description of the local offsite services to be provided in support of the licensee's emergency organization.

By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee



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to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.

**The applicable informing criteria described in NUREG-0654, Section II.C. states:**

1. The Federal government maintains in-depth capability to assist licensees, States and local governments through the Federal Radiological Monitoring and Assessment Plan (formerly Radiological Assistance Plan (RAP) and Interagency Radiological Assistance Plan (IRAP). Each State and licensee shall make provisions for incorporating the Federal response capability into its operation plan, including the following:

1.a specific persons by title authorized to request Federal assistance; see A.1.d., A.2.a.

1.b specific Federal resources expected, including expected times of arrival at specific nuclear facility sites; and

4. Each organization shall identify nuclear and other facilities, organizations or individuals which can be relied upon in an emergency to provide assistance. Such assistance shall be identified and supported by appropriate letters of agreement.

**10 CFR 50.47(b)(6) states:** "Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public."

The applicable emergency planning functions associated with 10 CFR 50.47(b)(6) state:

- Systems are established for prompt communication among principal emergency response organizations.
- Systems are established for prompt communication to emergency response personnel.

**The applicable supporting requirements described in 10 CFR 50, Appendix E.IV.E.9 states:**

At least one onsite and one offsite communications system; each system shall have a backup power source. All communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication. Where consistent with the function of the governmental agency, these arrangements will include:

- a. Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.
- c. Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.

**The applicable informing criteria described in NUREG-0654, Section II.F. state:**

1. The communication plans for emergencies shall include organizational titles and alternates for both ends of the communication links. Each organization shall establish reliable primary and backup means of communication for licensees, local and State response organizations. Such systems should be selected to be compatible with one another. Each plan shall include:

- a. provision for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions.
- b. provision for communications with contiguous State/local governments within the Emergency Planning Zones;
- d. provision for communications between the nuclear facility and the licensee's near-site Emergency Operations Facility, State and local emergency operations centers, and radiological monitoring teams;

**10 CFR 50.47(b)(7) states:** Information is made available to the public on a periodic basis on how they will be

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notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

The applicable emergency planning functions associated with 10 CFR 50.47(b)(7) state:

- Coordinated dissemination of public information during emergencies is established.

**There are no applicable supporting requirements described in 10 CFR 50, Appendix E with this change.**

**The applicable informing criteria described in NUREG-0654, Section II.G. state:**

3.a Each principal organization shall designate the points of contact and physical locations for use by news media during an emergency.

3.b Each licensee shall provide space which may be used for a limited number of the news media at the near-site Emergency Operations Facility.

**10 CFR 50.47(b)(8) states:** "Adequate emergency facilities and equipment to support the emergency response are provided and maintained."

The applicable emergency planning functions associated with 10 CFR 50.47(b)(8) state:

- Adequate facilities are maintained to support emergency response.

**The applicable supporting requirement which is described in 10 CFR 50, Appendix E.IV.E states (in part):** Adequate provisions shall be made and described for emergency facilities and equipment, including:

8.a. (i) A licensee onsite technical support center and an emergency operations facility from which effective direction can be given and effective control can be exercised during an emergency;

(ii) For nuclear power reactor licensees, a licensee onsite operational support center;

**The applicable informing criteria described in NUREG-0654, Section II.H. state:**

1. Each licensee shall establish a Technical Support Center and an onsite operations support center (assembly area) in accordance with NUREG-0696, Revision 1.

9. Each licensee shall provide for an onsite operations support center (assembly area) which shall have adequate capacity, and supplies, including, for example, respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment, cameras and communications equipment for personnel present in the assembly area.

**10 CFR 50.47(b)(14) states:** Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

The applicable emergency planning functions associated with 10 CFR 50.47(b)(14) state:

- A drill and exercise program (including radiological, medical, health physics, and other program areas) is

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established.

**The applicable supporting requirement which is described in 10 CFR 50, Appendix E.IV.F states:**

1. The program to provide for: (a) The training of employees and exercising, by periodic drills, of emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiological emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:

iv. Fire control teams (fire brigades);

**The applicable informing criteria described in NUREG-0654, Section II.N. state:**

2. A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each organization shall conduct drills, in addition to the annual exercise at the frequencies indicated below:

**2.b Fire Drills**

Fire drills shall be conducted in accordance with the plant (nuclear facility) technical specifications.

- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(1), because the change continues to ensure primary responsibilities for emergency response by the nuclear licensee and by State and local organizations within the Emergency Planning zones have been assigned and that the emergency responsibilities of the various supporting organization have been specifically established. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.A, because the change continues to ensure organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.A.
- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(2), because the change continues to ensure On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.A, because the change continues to maintain a description of the onsite emergency response organization (ERO) with a detailed discussion of Plant staff emergency assignment. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.B.
- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(3), because the change continues to ensure arrangements for requesting and effectively using assistance resources have been made. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.A, because the change continues to provide a description of the local offsite services to be provided in support of the licensee's emergency organization. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.C.
- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(6), because the change continues to support systems which are established for prompt

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communication from Catawba to principal emergency response organizations and to emergency response personnel, including DEMNET. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.E.9, because the change continues to ensure that onsite and offsite communications systems are in place, and there are provisions available in the emergency response facilities for communicating with state and local governments within the plume exposure pathway EPZ. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.F-1(a, b, and d).

- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(7), because the change continues to ensure the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.G.
- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(8), because the change continues to ensure that adequate facilities and equipment are maintained at Catawba and the Charlotte EOF to support emergency response, including DEMNET equipment used to notify state/county agencies. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.E, because these changes continue to ensure that adequate provisions shall be made and described for emergency facilities and equipment. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.H.
- Implementation of this revision does not affect the emergency planning functions associated with 10 CFR 50.47(b)(14), because the change continues to ensure that periodic drills will be conducted to develop and maintain key skills including fire drills. The change does not affect the applicable supporting requirement which is described in 10 CFR 50, Appendix E, IV.F, because these changes continue to include a description of specialized initial training and periodic retraining programs to be provided to fire brigade personnel. Additionally, the change continues to meet the intent of informing criteria described in NUREG-0654, Section II.N.

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Part IV. Description of Emergency Plan Planning Standards, Functions and Program Elements Affected by the Proposed Change (Address each function identified in Attachment 4, 10 CFR 50.54(q) Screening Evaluation Form, Part IV of associated Screen):

10 CFR 50.47(b)(1) Assignment of Responsibility

1a. Responsibility for emergency response is assigned.

10 CFR 50.47(b)(2) Onsite Emergency Organization

2a. Process ensures that onshift emergency response responsibilities are staffed and assigned

10 CFR 50.47(b)(3) Emergency Response Support and Resources

3a. Arrangements for requesting and using off site assistance have been made.

10 CFR 50.47(b)(6) Emergency Communications

6a. Systems are established for prompt communication among principal emergency response organizations.

10 CFR 50.47(b)(7) Public Education and Information

7b. Coordinated dissemination of public information during emergencies is established.

10 CFR 50.47(b)(8) Emergency Facilities and Equipment

8a. Adequate equipment is maintained to support emergency response.

10 CFR 50.47(b)(14) Drills and Exercises

14a. A drill and exercise program (including radiological, medical, health physics and other program areas) is established.

Part V. Description of Impact of the Proposed Change on the Effectiveness of Emergency Plan Functions:

A change is being made to section A.1.a that describes private sector organizations that are part of the overall response organization for the EPZ. Bell South Telephone Company is being changed to AT&T due to AT&T acquiring Bell South Telephone Company. This change is only an update of company name and does not modify the principal organization in the private sector that are part of the overall response organization for the EPZ.

Three changes are being made to section B that describes the site emergency organization.

1. Figure B-1a, Minimum on-shift ERO staffing requirements for emergencies, Emergency position "Non-Licensed Operator (NLO)" is being changed to "Auxiliary Operator (AO)". This change is needed so the site emergency plan will match the title of the position. An Auxiliary Operator is a Non-Licensed Operator but are not called that at the site and in site procedures. This change continues to ensure On-shift facility licensee responsibilities for emergency response are unambiguously defined.
2. B.9.b that lists organizations that are responsible for early warning or evacuation of the populace has a change to North Carolina Department of Crime Control and Public Safety. The organization name has changed to North Carolina Department of Public Safety. This change is needed so the site emergency plan aligns with the off-site organizations responsible for public health and safety. This change continues to

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ensure responsibility for emergency response is assigned.

3. B.9.h deleted note at bottom of page. The note adds no value to the emergency plan and was used as a reference to appendix 5. Appendix 5 is not being removed as a result of this note deletion. The emergency plan continues to provide a summary of written agreements with the agencies that have responsibilities for emergency preparedness support and for emergency response in the public domain. This change continues to ensure arrangements for requesting and effectively using assistance resources have been made.

Two changes are being made to section C that describes emergency response support and resources.

1. A change is being made to C.1.a which describes individual authorized to request federal assistance. Procedure SH/O/B/2005/002 (PROTOCOL FOR THE FIELD MONITORING COORDINATOR DURING EMERGENCY CONDITIONS) has been superseded by fleet procedure AD-EP-ALL-0203. This does not change who is authorized to request federal assistance. This change continues to describe specific persons by title authorized to request Federal assistance as described in NUREG 0654 section II.C.1.
2. C.1.b, deleted first sentence "The Agreement letter between Duke Energy and DOE - Savannah River is found in Appendix 5." This sentence is longer accurate since agreement letters were removed from the plan with revision 146. These agreements are verified current through annual recertification of the Catawba Emergency Plan. A copy of the annual recertification (including the agreements) is maintained on file by CNS Emergency Preparedness. The actual agreements are re-confirmed every 3 years and maintained on file by CNS Emergency Preparedness. This change continues to identify and describe the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies as require by 10 CFR 50, Appendix E.IV.A.

A change is being made due to the deletion of two Decision Line extensions (37706 and 37707) from new Charlotte EOF. There were two Decision Line phones located at the EOF Director's work location. These phones were not relocated to the new EOF on ECII. The purpose of the Decision Line function of DEMNET is for the offsite agencies to coordinate protective action decisions. The EOF Director and Assistant EOF Director are not normally part of those discussions. Extensions are provided for the North and South Carolina State Liaisons in the new EOF. If the offsite agencies wish for the EOF Director or Assistant EOF Director to participate in protective action decisions, he will use the State Liaison's extension. The Catawba Emergency Plan states that a telephone line is dedicated for the EOF Director to the state director at the SERT "via the Decision Line." The equivalent statement in the McGuire Emergency Plan states that telephone line is dedicated for the EOF Director to contact the state director at the SERT, but does not specify the Decision Line. While the two Decision Line DEMNET phones were removed from the EOF Director/Assistant EOF Director's work location, an additional commercial telephone was provided at the Assistant EOF Director's work location. The EOF Director and Assistant EOF Director each have a telephone, in addition to the Polycorn conference phone, allowing them to have open lines to NC, SC, and the TSC. Thus, there is no reduction in the ability of the EOF Director and Assistant EOF Director to communicate protective action recommendations to the Offsite Agencies.

A change is being made to section H which describes the Emergency Facilities and Equipment used by the CNS Emergency Response Organization. Figure H-1 Technical Support Center (TSC), H-2 Operations Support Center (OSC), and H-7 Joint Information Center (JIC) are being updated to represent current facility layout. These facilities were remodeled to improve use and incorporate new technology. The remodeling did not change the function of the facilities or location. This change continues to designate the points of contact and physical locations for use by news media during an emergency and continues to ensure adequate facilities are maintained to support emergency response.

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A change is being made to section which describes exercises and drills. This change adds references to AD-EG-ALL-1530 (Fire Brigade Training) and AD-EG-ALL-1531 (Selection, Care and Maintenance of Firefighting Ensembles). These procedures are administrative procedures that describe the Fire Brigade program. This change continues ensure periodic drills will be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills will be corrected including Fire Drills.

A change is being made to Appendix 5. A summary of the agreement was added to agreements 1-9 and 11. Agreement letters were removed from the plan with revision 146. These agreements are verified current through annual recertification of the Catawba Emergency Plan. A copy of the annual recertification (including the agreements) is maintained on file by CNS Emergency Preparedness. The actual agreements are re-confirmed every 3 years and maintained on file by CNS Emergency Preparedness. This change continues to identify and describe the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies as require by 10 CFR 50, Appendix E.IV.A.

**Part VI. Evaluation Conclusion.**

Answer the following questions about the proposed change.

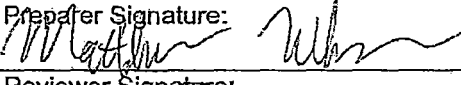
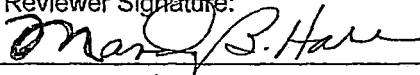
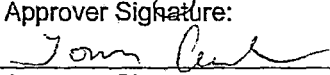
1	Does the proposed change comply with 10 CFR 50.47(b) and 10 CFR 50 Appendix E?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
2	Does the proposed change maintain the effectiveness of the emergency plan (i.e., no reduction in effectiveness)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3	Does the proposed change maintain the current Emergency Action Level (EAL) scheme?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
4	Choose one of the following conclusions:		
a	The activity does continue to comply with the requirements of 10 CFR 50.47(b) and 10 CFR 50, Appendix E, and the activity does not constitute a reduction in effectiveness or change in the current Emergency Action Level (EAL) scheme. Therefore, the activity can be implemented without prior NRC approval.	<input checked="" type="checkbox"/>	
b	The activity does not continue to comply with the requirements of 10 CFR 50.47(b) or 10 CFR 50 Appendix E or the activity does constitute a reduction in effectiveness or EAL scheme change. Therefore, the activity cannot be implemented without prior NRC approval.	<input type="checkbox"/>	

**Part VII. Disposition of Proposed Change Requiring Prior NRC Approval**

Will the proposed change determined to require prior NRC approval be either revised or rejected?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
--	------------------------------	-----------------------------

If No, then initiate a License Amendment Request in accordance 10 CFR 50.90 and AD-LS-ALL-0002, Regulatory Correspondence, and include the tracking number: \_\_\_\_\_.

## 10 CFR 50.54(q) Effectiveness Evaluation Form

Part VIII. Signatures: EP CFAM Final Approval is required for changes affecting risk significant planning standard 10 CFR 50.47(b)(4).		
Preparer Name (Print): Matthew Nelson	Preparer Signature: 	Date: 3/22/16
Reviewer Name (Print): Mandy Hare	Reviewer Signature: 	Date: 3/22/16
Approver (EP Manager) Name (Print): Tom Arlow	Approver Signature: 	Date: 3/22/16
Approver (CFAM, as required) Name (Print):	Approver Signature:	Date:
If the proposed activity is a change to the E-Plan or implementing procedures, then create two EREG General Assignments.		
◦ One for EP to provide the 10 CFR 50.54(q) summary of the analysis, or the completed 10 CFR 50.54(q), to Licensing.		<input checked="" type="checkbox"/>
◦ One for Licensing to submit the 10 CFR 50.54(q) information to the NRC within 30 days after the change is put in effect.		<input checked="" type="checkbox"/>

QA RECORD



**Catawba Nuclear Station  
Emergency Plan Revision 16-1  
Attachment 2  
Plan Update Instructions**

**Replace Revision 16-1 Cover Sheet with Revision 146 Cover Sheet**

**List of Effective Pages (LOEP)**

Replace entire LOEP

**Table of Contents**

Replace all pages of this section.

**List of Figures**

Replace all pages of this section.

**Introduction**

Replace all pages of this section.

**Tab A - Assignment of Responsibility**

Replace all pages of this section

**Tab B- Site Emergency Organization**

Replace all pages of this section

**Tab C - Emergency Response Support and Resources**

Replace all pages of this section

**Tab F - Emergency Communications**

Replace all pages of this section

**Tab H - Emergency Facilities and Equipment**

Replace all pages of this section

**Tab N - Exercises and Drills**

Replace all pages of this section

**Tab Q - Appendix 5 - Agreement Letters**

Remove all pages of this section

**Catawba Nuclear Station  
Emergency Plan Revision 16-1  
Attachment 3  
Emergency Plan Revision 16-1**

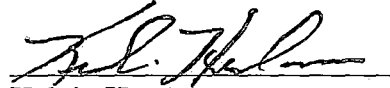
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DUKE ENERGY CORPORATION  
CATAWBA NUCLEAR STATION  
EMERGENCY PLAN

REVISION 16-1

March 2016

APPROVED:



Kelvin Henderson  
Site Vice President  
Catawba Nuclear Station

03/29/16  
Date Approved

Original Issue: August, 1980

DUKE ENERGY  
CATAWBA NUCLEAR STATION  
EMERGENCY PLAN

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## INTRODUCTION

### A. PURPOSE

This Emergency Plan for the Catawba Nuclear Site is established for the protection of life and property in all emergency and accident situations. It particularly applies to those radiological situations (radiation, contamination and reactor accidents) where the health and safety of station personnel and the general public may be involved; but it also includes other general industrial emergency and accident conditions involving radioactive materials such as fire, vehicular accidents, natural disasters, medical injury or illness and industrial security.

The plan described herein will be implemented at Catawba by incorporating it into detailed station Emergency Procedures; as such, it will be coordinated with station operating, radiological control, and industrial security procedures.

### B. SCOPE

The Emergency Plan is a coordinated effort involving station personnel; station facilities and equipment; the emergency resources of Duke Energy corporate organizations; emergency services of various local, state and federal agencies having appropriate jurisdiction or concern for public health and safety, particularly the radiological emergency and emergency plans of local county Preparedness Agencies; South Carolina Emergency Management Division of the S.C. Adjutant General's Office, the South Carolina Department of Health and Environmental Control, Bureau of Radiological Health; the North Carolina Department of Crime Control and Public Safety, and the North Carolina Department of Environment, Health and Natural Resources, Division of Radiation Protection.

The Emergency Plan organization and the emergency organizations that have responsibilities in the management of an emergency condition at the station are identified throughout the Plan. The Emergency Planning Zone concept is shown in NUREG-0654, Rev. 1, and is utilized in this plan.

The key elements of the Emergency Plan include:

- a. An essentially uniform means of reporting and handling any emergency or accident situation.
- b. A graded emergency classification system of increasing severity, based on specific criteria, Emergency Action Levels (EAL's) and a method for relating EALs to U.S. EPA Protective Action Guides (PAG's).
- c. Interaction with the emergency plans of appropriate local, state and federal agencies concerned with public health and safety in the event of a reactor accident.

The Emergency Plan is compatible with facility design features, site, layout and site location, with respect to such considerations as access routes, surrounding population distributions and lake and land use.

Agreements have been made with local, state and federal authorities for coordination of activities in the event of an emergency. Local agencies provide fire protection, medical support, and ambulance rescue service upon request. In addition, the emergency plans of the Emergency Preparedness Agencies of the counties involved provides assistance and logistical support in the event that evacuation of portions of the Plume Exposure Emergency Planning Zone becomes necessary. The disaster plans of the Emergency Preparedness Agencies in York County where the station is located, and of the Emergency Management Agencies in the adjacent counties (Mecklenburg and Gaston) as they relate to the protection of the public who may be affected by an accident situation at Catawba, all include the following aspects:

- a. Notification of their own Emergency Preparedness Agency personnel and other emergency services involved in their Emergency Plans.
- b. Law enforcement and traffic control.
- c. Notification or warning of persons in affected areas.
- d. Evacuation as necessary to designated schools or other public buildings out of the affected area, where shelter, food, overnight accommodations, medical care, etc., would be made available.
- e. Assistance and cooperation with related agencies in other counties, Duke Energy and other state and federal agencies.

Means have been developed for notification and coordination of emergency activities with persons and groups on site as well as within the Exclusion Area, including portions on Lake Wylie which might be affected by an accident, as well as water authorities of nearby cities and industries downstream.

Duke Energy intends to meet all of the requirements for early warning of the public and will periodically evaluate the resources necessary to provide this capability.

Radiological emergency situations, if they occur at all, are expected for the most part, to be highly localized, and only station property and station personnel are subject to any potential major hazard.

Members of the public are also within the Exclusion Area at various times (highway traffic, station visitors, boating and recreation on Lake Wylie, etc.). In case of a major accidental release of radioactivity, the general public and property in the Emergency Planning Zone may also be affected. The plan includes provisions for the protection of all persons in the plume exposure pathway, as well as in the ingestion pathway, of the Emergency Planning Zone.

#### C. PLANNING BASIS

The bases for this plan are the upgraded Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG-0654/FEMA-REP 1, Rev. 1, and 10CFR50. The overall objective of the Emergency Plan is to provide for early detection, warning and protective action response and

recommendations for emergency conditions at Catawba that may affect the station proper and/or off-site areas. The range of emergency conditions is very large, starting with a zero point requiring no planning at all, up to planning for the worst possible accident scenario, regardless of its extremely low likelihood. Although the planning basis is independent of specific accident scenarios, a number of emergency conditions were considered in the development of this plan, including core melt release sequences.

The planning basis also considers time frames between initial accident recognition, response actions, and recommendation of appropriate protective actions in the event a potential for, or an actual release of radioactive materials is taking place. Knowledge of the potential for and the kinds of radioactive materials released, duration of the release and the time available to activate protective response on-site and off-site is important in determining what instructions/recommendations are to be given. Location of the population affected and communication mechanisms to those authorities responsible for activating protective action is also an important part of the planning basis.

### Emergency Planning Zones

With regard to the area over which planning efforts should be carried out, "Emergency Planning Zones" (EPZs) about each nuclear facility are defined both for the short term "plume exposure pathway" and for the longer term "ingestion exposure pathways." EPZs are defined as the areas for which planning is needed to assure that prompt and effective actions can be taken to protect the public in the event of an accident. The state response organizations are principally responsible for the planning associated with the ingestion exposure pathway.

The emergency plans are related to two predominant exposure pathways. They are:

- a. Plume exposure pathway -- The principal exposure sources from this pathway are: (a) external exposure to gamma radiation from the plume and from deposited material; and (b) inhalation exposure from the passing radioactive plume. The duration of the release leading to potential exposure could range from one-half hour to days. For the plume exposure pathway, shelter and/or evacuation would likely be the principal immediate protective actions to be recommended for the general public. A recommendation to administer prophylactic iodine to the public would also be considered based on radioiodine dose projections.

The size (about 10 miles radius) of the plume exposure EPZ (refer to Figure i-1) was based primarily on the following considerations:

- a. projected doses from the traditional design basis accidents would not exceed Protective Action Guide levels outside the zone;
- b. projected doses from most core melt sequences would not exceed Protective Action Guide levels outside the zone;
- c. for the worst core melt sequences, immediate life threatening doses would generally not occur outside the zone;



- d. detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.
- b. Ingestion exposure pathway -- The principal exposure from this pathway would be from ingestion of contaminated water or foods such as milk, fresh vegetables or aquatic foodstuffs.

The duration of potential exposure could range in length from hours to months. For the ingestion exposure pathway, the planning effort involves the identification of major exposure pathways from contaminated food and water and the associated control and interdiction points and methods. The ingestion pathway exposures in general would represent a longer term problem, although some early protective actions to minimize subsequent contamination of milk or other supplies should be initiated (e.g., remove cows from pasture and put them on stored feed).

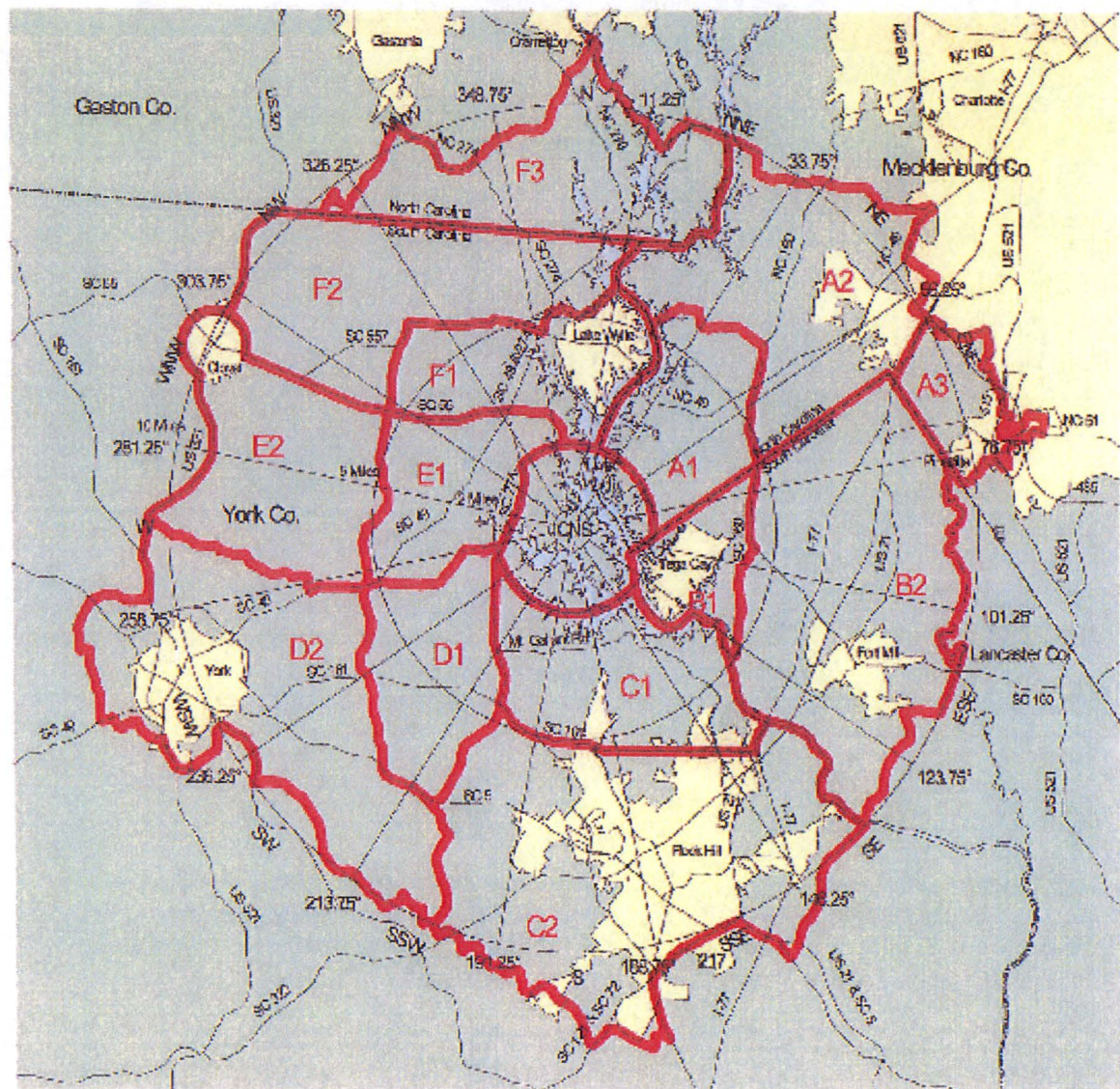
The size of the ingestion exposure EPZ (about 50 miles in radius, which also includes the 10-mile radius plume exposure EPZ [Refer to Figure i-2]) was selected because:

- a. the downwind range within which contamination will generally not exceed the Protective Action Guides is limited to about 50 miles from a power plant because of wind shifts during the release and travel periods;
- b. there may be conversion of atmospheric iodine (i.e., iodine suspended in the atmosphere for long time periods) to chemical forms which do not readily enter the ingestion pathway;
- c. much of any particulate materials in a radioactive plume would have been deposited on the ground within about 50 miles from the facility; and
- d. the likelihood of exceeding ingestion pathway protective action guide levels at 50 miles is comparable to the likelihood of exceeding plume exposure pathway protective action guide levels at 10 miles.

The NRC has concluded that it would be unlikely that any protective actions for the plume exposure pathway would be required beyond the plume exposure EPZ. Also, the plume exposure EPZ is of sufficient size for actions within this zone to provide for substantial reduction in early severe health effects (injuries or deaths) in the event of a worst case core melt accident.

DUKE ENERGY  
CATAWBA NUCLEAR STATION  
FIGURE I-1

10 MILE EPZ



— Zone or EPZ Boundary  
and Zone Numbers

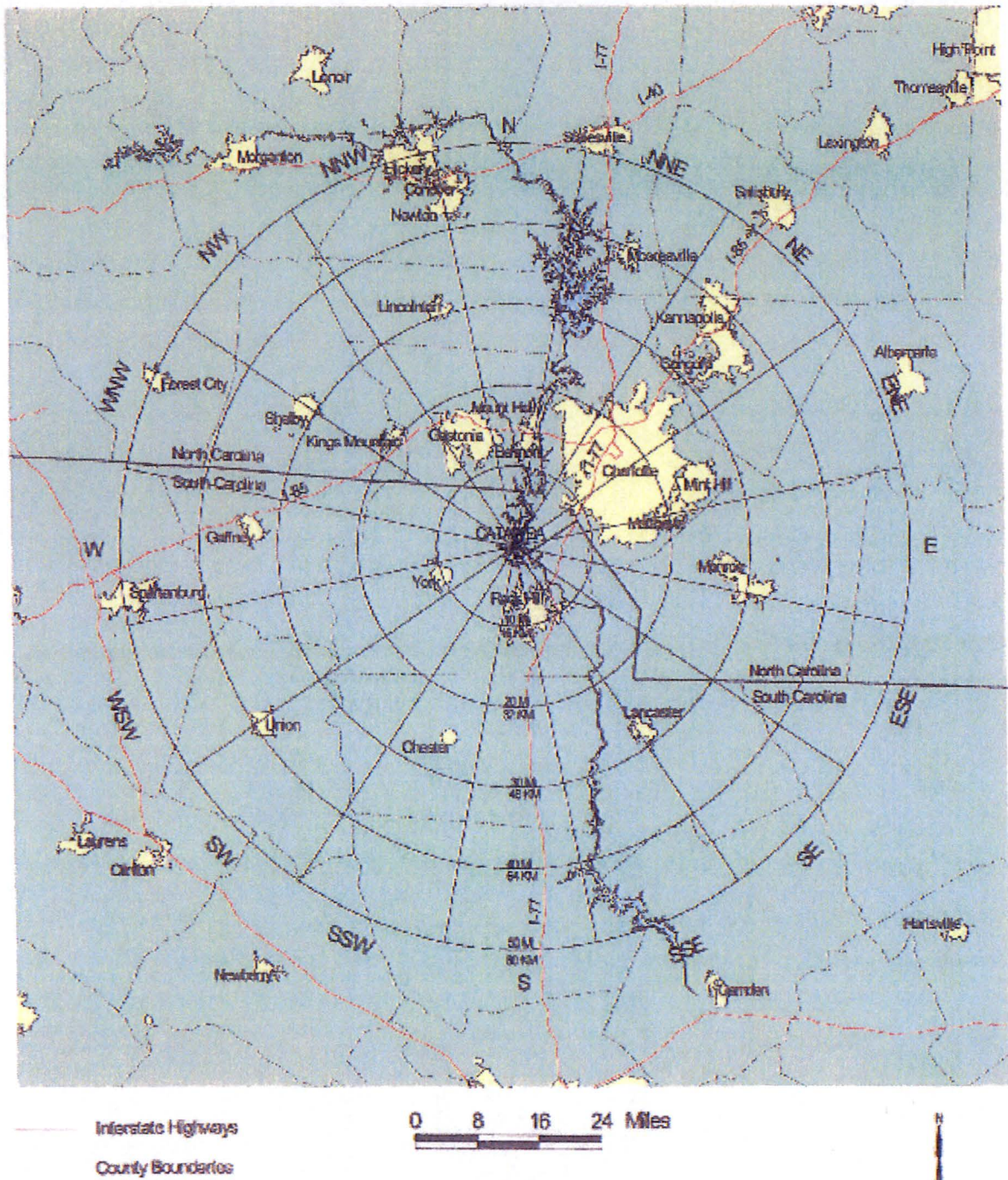
0 2 4 6 Miles





DUKE ENERGY  
CATAWBA NUCLEAR STATION  
FIGURE I-2

50 MILE EPZ



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	Q-4.1	16-1	March 2016
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	Q-5.1	16-1	March 2016
	Q-5.2	16-1	March 2016

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Catawba Nuclear Station  
Emergency Plan  
Section A - Assignment of Responsibility

A. Assignment of Responsibility

Planning Objective

To assure that State, Local, Federal, private sector, Duke Energy Corporate and Catawba Nuclear Station organizations that are part of the overall response organization within the Catawba Emergency Planning Zone are identified.

A.1.a Organization

The principal organizations that are part of the overall response organization within the Catawba Emergency Planning Zone are listed below:

Federal

NRC (Nuclear Regulatory Commission)  
FEMA (Federal Emergency Management Agency)  
DOE (Department of Energy)

NOTE: NRC, FEMA, and DOE will coordinate response of other Federal Agencies per the Federal Radiological Emergency Response Plan (FRERP).

South Carolina State

S.C. Emergency Management Division of the S.C. Adjutant General's Office (Note 1)  
S.C. Department of Health and Environmental Control, Bureau of Radiological Health

North Carolina State

N.C. Department of Crime Control and Public Safety, Division of Emergency Management (Note 1)  
N.C. Department of Environment, Health and Natural Resources, Division of Radiation Protection

Local Government

The county governments and municipal governments (within the counties) to include the emergency service departments and other agencies interrelated to these local governments within the 10-mile EPZ (plume exposure pathway) of Catawba Nuclear Station are:

York  
Gaston  
Mecklenburg

The county governments (and municipal governments within the counties) to include the emergency service departments and other agencies interrelated to these local governments within a 50-mile EPZ (ingestion exposure pathway) of Catawba Nuclear Station are:

South Carolina (Note 2)

Cherokee	Lancaster
Chester	Newberry
Chesterfield	Spartanburg
Fairfield	Union
Kershaw	York

North Carolina (Note 2)

Anson	Cleveland	Mecklenburg	Union
Burke	Gaston	Rowan	
Cabarrus	Iredell	Rutherford	
Catawba	Lincoln	Stanley	

Note 1: This agency has the principal state responsibility for emergency response.

Note 2: Agreement letters with these agencies are not a part of the Catawba Nuclear Station Emergency Plan unless specifically noted in A-3.

Private Sector

The principal organizations in the private sector that are part of the overall response organization for the EPZ are:

Westinghouse  
AT & T  
The Independent Telephone Companies  
Radio and Television Stations  
Bethel Volunteer Fire Department  
Various vendors such as GTS and Bartlett  
Carolinas Medical Center  
Center for Emergency Medicine (Rock Hill, S.C.)  
Member's Southeastern Electric Exchange  
The Salvation Army  
The American Red Cross  
Piedmont Medical Center (Rock Hill, SC)

Non-Government Organizations

INPO (Institute of Nuclear Power Operations), risk management companies and the ANI (American Nuclear Insurers)

#### A.1.b Concept of Operations

All emergencies or accident situations at the station are handled initially by the Shift Manager. When an abnormal situation occurs, the Shift Manager is able, utilizing station operating and emergency procedures and from background, training and experience, to determine if the abnormal situation is an emergency condition. During the course of the emergency condition and as response personnel are notified, and emergency centers are staffed (OSC, TSC, EOF), the Shift Manager is the person in charge, and assumes the functions of the Emergency Coordinator until the arrival of the Station Manager/designee. When the Station Manager/designee arrives and relieves the Shift Manager of the Emergency Coordinator function, he/she becomes the person in charge or the decision-maker. When the Emergency Operations Facility (EOF) is activated and operational, the EOF Director at the EOF is responsible for company emergency response.

The Control Room at the station is the initial center for coordination of emergency response for all emergency conditions. For emergencies classified as Alert, Site Area Emergency and General Emergency, the Emergency Coordinator shall activate the Emergency Response Organization.

The TSC acts in support of the command and control function of the Control Room and provides an area for other station personnel who have expertise in all areas of plant operation to support the emergency response. This facility is equipped with communication equipment, Operator Aid Computer (OAC) terminals, line printers, off-site and on-site computer access, plant drawings, procedures and other materials and equipment to support its function. Personnel in the TSC will be able to assess the accident condition and make responsible recommendations to the Control Room, the EOF and off-site agencies as necessary to provide for the safety of plant personnel and members of the general public. After the EOF is operational and activated, it will assume many of the functions of the TSC and will rely on the TSC as a vital link to the station. The TSC will provide the EOF with up-to-date plant parameters, which will allow this facility to perform its assigned tasks.

The responsibility of the Control Room, TSC and EOF for the various emergency response functions is further detailed in Figure A-1.

#### A.1.c Block Diagram of Organization Interrelationships

See Figures B-1a and B1b, B-2, B-3, B-4, and B-5.

#### A.1.d Key Decision-Making

During the course of any emergency condition at Catawba, several persons have the potential to be "in charge" or to be the "Key Decision Maker". Prior to TSC activation and arrival of the Station Manager/designee, the Shift Manager assumes the functions of the Emergency Coordinator at the Station and is in charge. When the Station Manager/designee arrives on-site and assumes the Emergency Coordinator function, he/she becomes the person in charge of emergency response and becomes the key decision-maker. After EOF is operational and activated, the EOF Director is responsible for company emergency response.

A.1.e 24 Hour Emergency Response

The Catawba Station emergency response organization beginning with the Control Room through the TSC is capable of responding to an emergency 24 hours per day, 7 days per week. Section E.2 describes the notification scheme within the station emergency response organization.

A.2.a Responsibility For and Functions of State and Local Government Emergency Response Organization

(See State and County Plans)

A.2.b Legal Basis For Authority

(See State and County Plans)

A.3 Agreement Letters For Emergency Response Support from Off-site Agencies

Section Q, Appendix 5 contains letters of agreement with the following organizations:

Piedmont Medical Center  
Carolinas Medical Center  
York County Emergency Management  
Bethel Volunteer Fire Department  
Charlotte-Mecklenburg Emergency Management Office  
Gaston County Emergency Management  
Center for Emergency Medicine (Rock Hill, SC)  
North Carolina Division of Emergency Management  
South Carolina Emergency Management Division  
Radiation Emergency Assistance Center/Training Site (REAC/TS)  
DOE - Savannah River  
INPO - Fixed Nuclear Facility Voluntary Assistance Agreement  
JIC - Joint Information Center  
York County Sheriff

These Letters of Agreement shall be updated as necessary and at least once every three (3) years.

A.4 Individual Responsible for Continuity of Resources

The emergency response organization is capable of continuous (24 hours/day) operation for an extended period of time. The EOF Director is the individual responsible for assuring continuity of resources within the emergency response organization.

# FIGURE A-1

## RESPONSIBILITY FOR EMERGENCY RESPONSE FUNCTIONS

<u>Emergency Response Functions</u>	<u>Emergency Class</u>			
	<u>Unusual Event</u>	<u>Alert</u>	<u>Site Area Emergency</u>	<u>General Emergency</u>
Supervision of reactor operations and manipulation of controls	CR	CR	CR	CR
Management of plant operations	CR (TSC)	TSC	TSC	TSC
Technical support to reactor operations	CR (TSC)	TSC	TSC	TSC
Management of corporate emergency response resources	CR (TSC) (EOF)	EOF	EOF	EOF
Radiological effluent and environs monitoring, assessment and dose projection	CR (TSC) (EOF)	EOF	EOF	EOF
Inform state and local emergency response organizations and make recommendations for public protective actions	CR (TSC) (EOF)	EOF	EOF	EOF
Management of recovery operations	CR (TSC) (EOF)	TSC/EOF	TSC/EOF	TSC/EOF
Technical support of recovery operations	CR (TSC) (EOF)	TSC/EOF	TSC/EOF	TSC/EOF

NOTE: (TSC) (EOF) indicates that activation of these facilities or the performance of this function is optional for the indicated emergency class.

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Catawba Nuclear Station  
Emergency Plan  
Section B - Site Emergency Organization

B. Site Emergency Organization

B.1 Plant Staff Under Emergency Conditions

Figure B-2 shows the emergency organization of plant staff personnel for all shifts. The relationship of these personnel to their normal responsibilities and duties is unchanged during an emergency condition.

B.2 Emergency Coordinator

Initial activities at Catawba during any emergency condition are directed by the Operations Shift Manager from the Control Room. The Operations Shift Manager shall assume the functions of the Emergency Coordinator until the arrival of the Station Manager/designee at which time the Station Manager/designee will assume the functions of the Emergency Coordinator. The Emergency Coordinator will have the authority and the responsibility to immediately and unilaterally initiate any emergency actions including:

- a. Provide protective action recommendations to authorities responsible for implementing off-site emergency measures, implement event classification, notification, and event escalation/de-escalation/termination. **THIS AUTHORITY SHALL NOT BE DELEGATED TO OTHER ELEMENTS OF THE EMERGENCY ORGANIZATION.**
- b. Notification and activation of the Station, Corporate, County/City, South Carolina, North Carolina and the Nuclear Regulatory Commission emergency organizations having a response role.
- c. Continued assessment of actual or potential consequences both on- site and off-site throughout the evolution of the emergency condition.
- d. Effective implementation of emergency measures in the environs including protective actions for affected areas, implementation of emergency monitoring teams and facilities to evaluate the environmental consequences of the emergency condition, prompt notification and communications with off-site authorities.
- e. Continued maintenance of an adequate state of emergency preparedness until the emergency situation has been effectively managed and the station is returned to a normal or safe operating condition.

B.3 Emergency Coordinator (Line of Succession)

The Emergency Coordinator function as described above in paragraph B.2 will later be assumed by the EOF Director at the Emergency Operations Facility as this organization is staffed and ready to take over its functions.

This assumption of the Emergency Coordinator functions will take place for the Alert, Site Area Emergency and General Emergency categories.

#### B.4 Functional Responsibilities of the Emergency Coordinator

The functional responsibilities of the Emergency Coordinator are described in paragraph B.2. Protective Action recommendations to state and local authorities is initially vested with the Operations Shift Manager/ Emergency Coordinator. As the Emergency Operations Facility (EOF) becomes operational, the EOF Director is the person who is responsible for making protective action recommendations.

#### B.5 Minimum Staffing Requirements

The positions, title and major tasks to be performed by the persons assigned to the functional areas of emergency activity at the station are described in Emergency Plan Implementing Procedures. These assignments shall cover the emergency functions in Figure B-1 (a and b). The minimum on-shift staffing reflective of two units in operation is as indicated in Figure B-1a. The capability to augment on-shift resources after declaration of an emergency is as indicated in Figure B-1b. The functional tasks to be performed by persons assigned to the areas of emergency activity are as designated in Emergency Plan Implementing Procedures.

A detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in Figure B-1a. See CNS-OSSA-12212012 Rev: 0.

#### B.6 Site Functional Area Interfaces

Figures B-4 and B-5 describe and specify the interfaces between and among the functional areas of emergency activity, licensee headquarters support, local services support, and state/local government response organizations. Figure B-4 is for use prior to activation of the EOF. Figure B-5 is for use after the EOF is established.

#### B.7 Augmented Support of Site Emergency Organization

Upon declaration of an Alert, Site Area Emergency or General Emergency, the EOF organization will be alerted and personnel will report to the EOF as soon as possible. The EOF organization is described in Emergency Plan Implementing Procedures. The Public Affairs organization is described in the implementing procedure for JIC activation. Refer to Section G for the Public Affairs function. Figure B-3 shows the minimum staff required to declare the EOF operational. The EOF will be staffed using 75 minutes as a goal for the minimum staff to be in place and operational.

In addition to the minimum staff shown in Figure B-3, other personnel are expected to report to the EOF to augment the minimum staff. This augmentation would occur gradually and would range from a few minutes to a few hours depending on the proximity of the personnel to the EOF.

The organization identified in this section is capable of continuous (24 hours) operations for a protracted period. The individual responsible for assuring continuity of resources is the EOF Director. Each group's operational plan is specified in the Emergency Plan or Emergency Plan Implementing Procedures.

#### B.8 Contractor, Private, and Government Organizations

The Institute of Nuclear Power Operations (INPO) serves as a clearinghouse for industry wide support during an emergency. When notified of an emergency situation at a nuclear plant, INPO will provide emergency response as requested.

INPO will be able to provide the following emergency support functions:

- a. Assistance to the affected utility in locating sources of emergency manpower and equipment.
- b. Analysis of the operational aspects of the incident.
- c. Dissemination to member utilities of information concerning the incident.
- d. Organization of industry experts who could advise on technical matters.

If requested, one or more suitably qualified members of the INPO staff will report to the EOF Director and will assist in coordinating INPO's response to the emergency.

#### The State of South Carolina

The response provided by the State of South Carolina to an emergency developing at Oconee or Catawba is described in the South Carolina Operational Radiological Emergency Response Plan. The principal state agency for mobilization of state resources to cope with an emergency is the Emergency Preparedness Division under the office of the Adjutant General. This agency is supported by the Bureau of Radiological Health, which provides radiological assessment and protection functions, and by other state agencies.

For a Catawba emergency, the State of South Carolina would operate out of the State Emergency Operations Center (SEOC) in West Columbia, South Carolina.

#### The State of North Carolina

The response by the State of North Carolina to an emergency development is described in the North Carolina Emergency Response Plan in Support of Catawba Nuclear Site.

The principal state agency for mobilization of State resources to cope with an emergency is the Division of Emergency Management. This agency is supported by the Division of Radiation Protection for radiological assessment and protection functions, and by other State agencies.

The state organization, when it is mobilized as the State Emergency Response Team (SERT), becomes the primary response authority. For an emergency at Catawba, the SERT organization is established in the Emergency Operations Center in Raleigh, N.C.

#### Nuclear Regulatory Commission

The response provided by the NRC to an emergency developing at a Duke nuclear station is described in the NRC Region II Emergency Plan. The representative of the NRC who would provide input to the EOF Director is the Region II Regional Administrator/ designee. A workspace and a telephone have been provided in the EOF for this NRC representative.

The role of the NRC in an emergency situation is to provide oversight and recommendations on licensee actions.

#### County Governments

In an emergency situation at a nuclear station, county governments are immediately notified of the accident. They have the primary responsibility for the protection of the citizens within the county boundaries. The principal Duke Energy contact with county government is through the Emergency Preparedness Director or designee. This contact will be maintained by the TSC until relieved by EOF Off-Site Agency Communicators.

It is recognized that the county council, the chief executive of the county, and mayors of local communities have responsibilities in an emergency situation as well. The Government Agency Liaison on the staff of the Public Information Manager serves as the primary Duke Energy contact with these people.

#### Risk Management Companies

Risk management companies will be notified of emergency conditions by the EOF staff. Risk Management companies would set up claims payments and other such capabilities at facilities appropriate to the emergency.

#### Contractors

The contractor who may be requested to respond is Westinghouse. Westinghouse will operate from Pittsburgh, Pennsylvania, with a small contingent at the plant.

### **B.9 Local Agency Support Services**

State, local and county agencies responsible for public health and safety work through the Emergency Preparedness Agency's Emergency Operations Center in the affected county until the State Emergency Response Team establishes its headquarters; Mecklenburg and Gaston counties, North Carolina; York Municipal-County Emergency Preparedness Agency, York County, South Carolina. The EOF coordinates with the agencies necessary to support the emergency condition. Agencies that have agreed to provide support, as necessary to Catawba Nuclear Station and surrounding areas, are listed below: (Agreement Letters in Appendix 5)

B.9.a Law Enforcement, Emergency Traffic Control, Related Police Matters

1. York County Sheriff's Department (York, SC)
2. South Carolina Highway Patrol (SC Highway Patrol, Dist. 4, Chester, SC)

B.9.b Early Warning or Evacuation of the Populace

1. York County Emergency Management (Rock Hill, SC)
2. Gaston County Emergency Management (Gastonia, NC)
3. Charlotte-Mecklenburg Emergency Management Office (Charlotte, NC)
4. South Carolina Emergency Management Division (Columbia, SC)
5. North Carolina Department of Department of Public Safety

B.9.c Radiological Emergency Monitoring Assistance

1. US/DOE Radiological Assistance Team, Savannah River Operations Office (Aiken, SC)
2. South Carolina Department of Health and Environmental Control, Bureau of Radiological Health, (Columbia, SC)
3. North Carolina Department of Environment, Health and Natural Resources, Division of Radiation Protection (Raleigh, NC)
4. Civil Air Patrol, North Carolina Wing (Charlotte, NC)

B.9.d Hospitals, Medical Support

1. Piedmont Medical Center (Rock Hill, SC)
2. Carolinas Medical Center (Charlotte, NC)
3. Carolinas Emergency Medicine Specialists, P.A. (Rock Hill, SC)
4. REACTS Facility, DOE (Oak Ridge, TN)

B.9.e Ambulance Service

1. Piedmont Medical Center (Rock Hill, SC)

B.9.f Fire-Fighting

1. Bethel Volunteer Fire Department (Clover, SC)

B.9.g Public Health and Safety, Evaluation of the Radiological Situation.

1. York County Health Department (Rock Hill, SC)
2. South Carolina Department of Health and Environmental Control, Bureau of Radiological Health (Columbia, SC)
3. North Carolina Department of Environment, Health and Natural Resources, Division of Radiation Protection (Raleigh, NC)

#### B.9.h Local, State and Federal Support Responsibilities

Agreements have been made with local, state and federal agencies to provide fire protection, medical support, ambulance and rescue service, and Hostile Action response. Implementation of the emergency plans of the Emergency Preparedness Agencies of three adjacent counties will provide assistance and logistics support if evacuation of portions of the ten mile EPZ becomes necessary. The emergency plans of the Emergency Preparedness Agencies in York County where the station is located, and in Mecklenburg and Gaston Counties, North Carolina, as they relate to the protection of the public who may be affected by an emergency at Catawba, all address the following aspects:

1. Notification of their own personnel and other agencies involved, including the Sheriff's Department, the Highway Patrol, police, rescue squads, fire departments and the Red Cross.
2. Law enforcement and traffic control.
3. Notification or warning of persons in affected areas
4. Evacuation, as necessary, to designated schools or other public buildings out of the affected area, where shelter, food, overnight accommodations, communications, medical care, etc. would be made available.
5. Assistance and cooperation with related agencies in other counties, Duke Energy, and other state and federal agencies.

FIGURE B-1a  
CATAWBA NUCLEAR STATION  
MINIMUM ON-SHIFT ERO STAFFING REQUIREMENTS FOR EMERGENCIES

Functional Area	Major Tasks	Emergency Positions	Shift Staffing
1. Plant Operations and Assessment of Operational Aspects (a)	--	Unit Supervisor (SRO) CR Supervisor (SRO) Control Room Operator (RO) Auxiliary Operator (AO)	1 1 3 3
2. Emergency Direction and Control	Command and Control	Operations Shift Manager	1
3. Notification & Communication	Licensee	Operator (SRO/RO/NLO)	1 <sup>(b)</sup>
	Local/ State	Operator (SRO/RO/NLO)	1 <sup>(b)</sup>
	Federal	Operator (SRO/RO/NLO)	1 <sup>(b)</sup>
4. Radiological Assessment	Dose Assessment	RP Qualified Individual	1
	In-plant Surveys	RP Qualified Individual	1
	Onsite Surveys	RP Qualified Individual	1
	Chemistry	Chemistry Technician	1
5. Plant System Engineering, Repair, and Corrective Actions	Tech Support – OPs – Core Damage	Shift Technical Advisor Shift Technical Advisor	1 1 <sup>(b)</sup>
	Repair and Corrective Actions	Mechanical Maintenance IAE Maintenance	1 2
6. In-Plant PAs	Radiation Protection (such as access control, job coverage and personnel monitoring)	RP Qualified Individual	2 <sup>(b)</sup>
7. Fire Fighting (c)	--	Fire Brigade Lead (RO/SRO/NLO) Fire Brigade Member (NLO) Fire Brigade Member (SPOC)	1 2 2 <sup>(b)</sup>
8. 1 <sup>st</sup> Aid and Rescue	--	MERT (d)	2
9. Site Access Control and Accountability	Security & Accountability	SAS Operator Security Personnel	1 (e)
Minimum # of Personnel:			23

(a) The Control Room staff complement is reflective of 2 Units in operation in accordance with §50.54(m).

(b) May be performed by an individual filling another position provided they are qualified to do the collateral function.

(c) The Fire Brigade requirement of five members is met by using three personnel from Operations (including the Fire Brigade Leader) and two personnel from SPOC (SLC 16.13-1).

(d) The Medical Emergency Response Team (MERT) can be filled by any qualified technician.

(e) Per Duke Energy CNS Security Plan.

FIGURE B-1b  
CATAWBA NUCLEAR STATION  
MINIMUM AUGMENTED ERO STAFFING REQUIREMENTS FOR EMERGENCIES  
PAGE 1 of 2

Major Functional Area	Major Task	Position, Title or Expertise	Capability for Additions	
			45 Min.	75 Min.
Emergency Direction and Control (Emergency Coordinator)		TSC Emergency Coordinator		1
Notification/Communication	Notify Company Personnel, State, County, Federal Agencies and Maintain Communication	Off-Site Agency Communicator		2
Emergency Operations Facility (EOF) Radiological Accident Assessment and Support	EOF Director	Senior Manager		1
	Dose Assessment	Radiological Assessment Manager		1
	Plant Status	Accident Assessment Manager		1***
	Access Control	Electronic Card Reader		#
	Communications	Off-Site Agency Communicators		2
Radiological Support and Protective Actions	Off-Site Surveys	FMT Members (2 Teams)		4*****
	RP Coverage for Repair/ Corrective Actions, Access Control, Search & Rescue, Radiochemistry, Contaminated Injury Medical Response, Personnel Monitoring, Dosimetry, Firefighting	RP Qualified Individuals		6
	Out of Plant Surveys		1	1
	In-Plant Surveys		1	1
	Dose Assessment	Off-Site Dose Assessor		1 (TSC)
	Radwaste Operations	Radwaste Operator		1
Plant System Engineering, Repair and Corrective Actions	Technical Support	Core/Thermal Hydraulics		1***
		Electrical		1
		Mechanical		1
	Repair and Corrective Actions	Mechanical Maint. Tech.		1
		IAE Technician		2
Firefighting		Fire Brigade		****
Rescue Operations and First Aid		MERT		****



FIGURE B-1b  
CATAWBA NUCLEAR STATION  
MINIMUM AUGMENTED ERO STAFFING REQUIREMENTS FOR EMERGENCIES  
PAGE 2 of 2

The 75 minute clock begins at the time of the initial Emergency Classification. The TSC/OSC are required to be activated within the same time. The EOF must be operational within 75 minutes of the Emergency Declaration. All facilities are required to be activated at an Alert or Higher Classification.

\*\*\* The TSC Reactor Engineer and the Accident Assessment Manager in the EOF will provide additional support in the area of core thermal hydraulics within 75 minutes.

\*\*\*\* Augmentation in these areas is provided by local support. The local support agencies respond in accordance with existing letters of agreement. Response is expected to occur similar to any other industrial facility.

\*\*\*\*\* The Field Monitoring Teams will initially report to the Operations Support Center (OSC). If needed, the Field Monitoring Teams will be dispatched from the Operations Support Center (OSC). Once the Emergency Operations Facility (EOF) Field Monitoring Coordinator is ready he/she will assume control of the Field Monitoring Teams. An FMT consists of one RP qualified individual and one vehicle driver

# An electronic card reader in conjunction with a posted building security officer fulfills the function for controlling access to the EOF during emergencies.

FIG B-2  
CATAWBA NEAR STATION  
SITE EMERGENCY ORGANIZATION

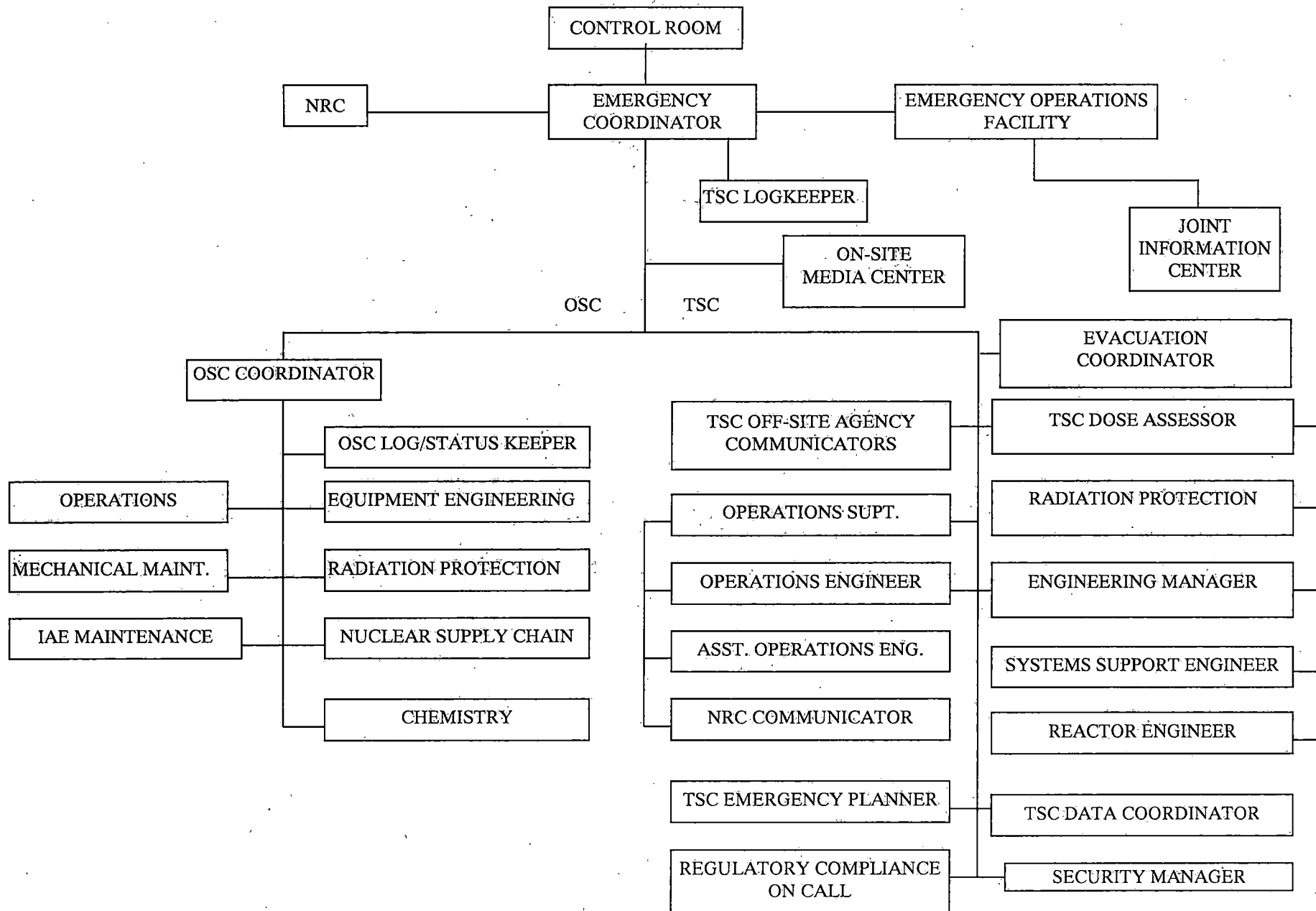


FIGURE B-3  
CATAWBA NUCLEAR STATION  
EOF ORGANIZATION - MINIMUM STAFFING REQUIREMENTS

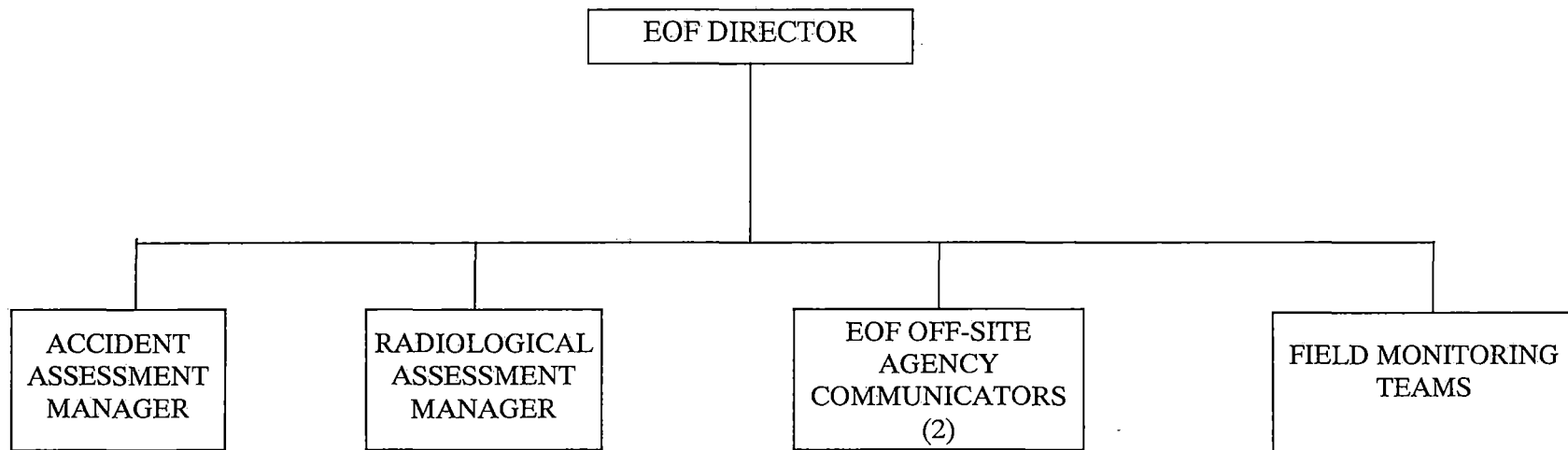
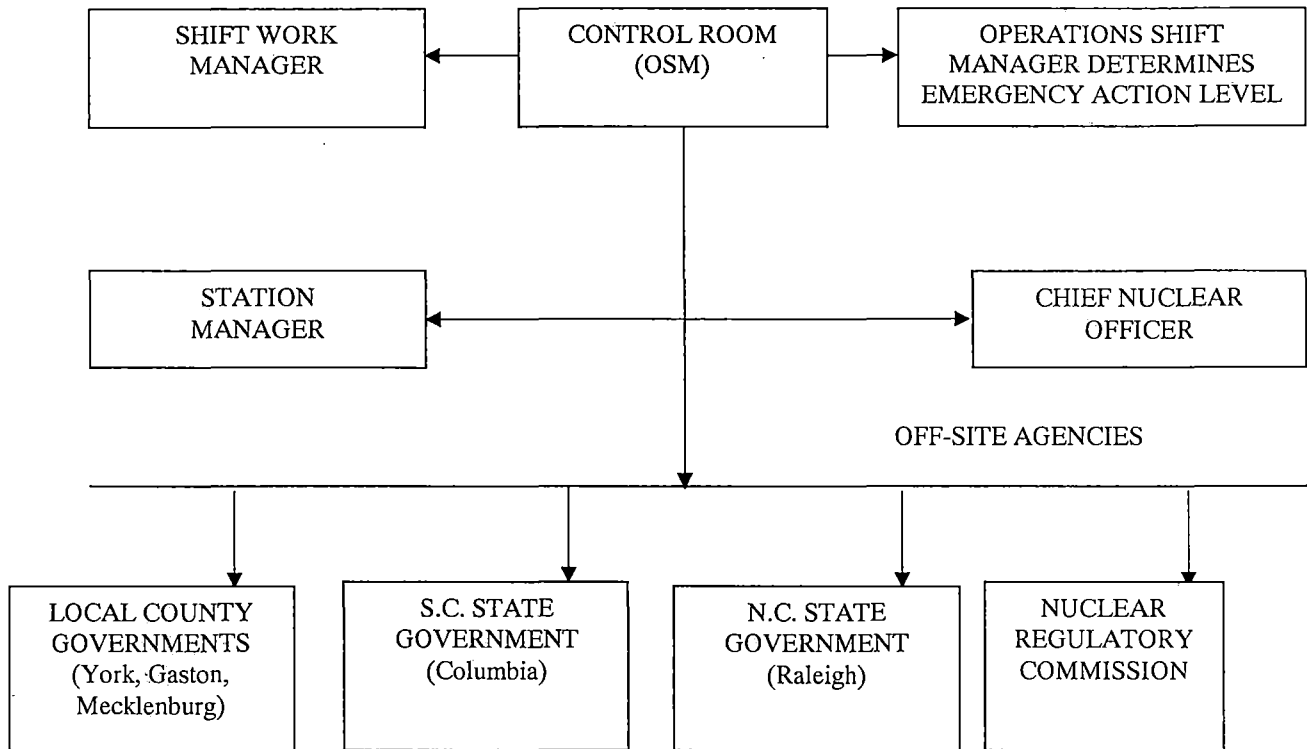
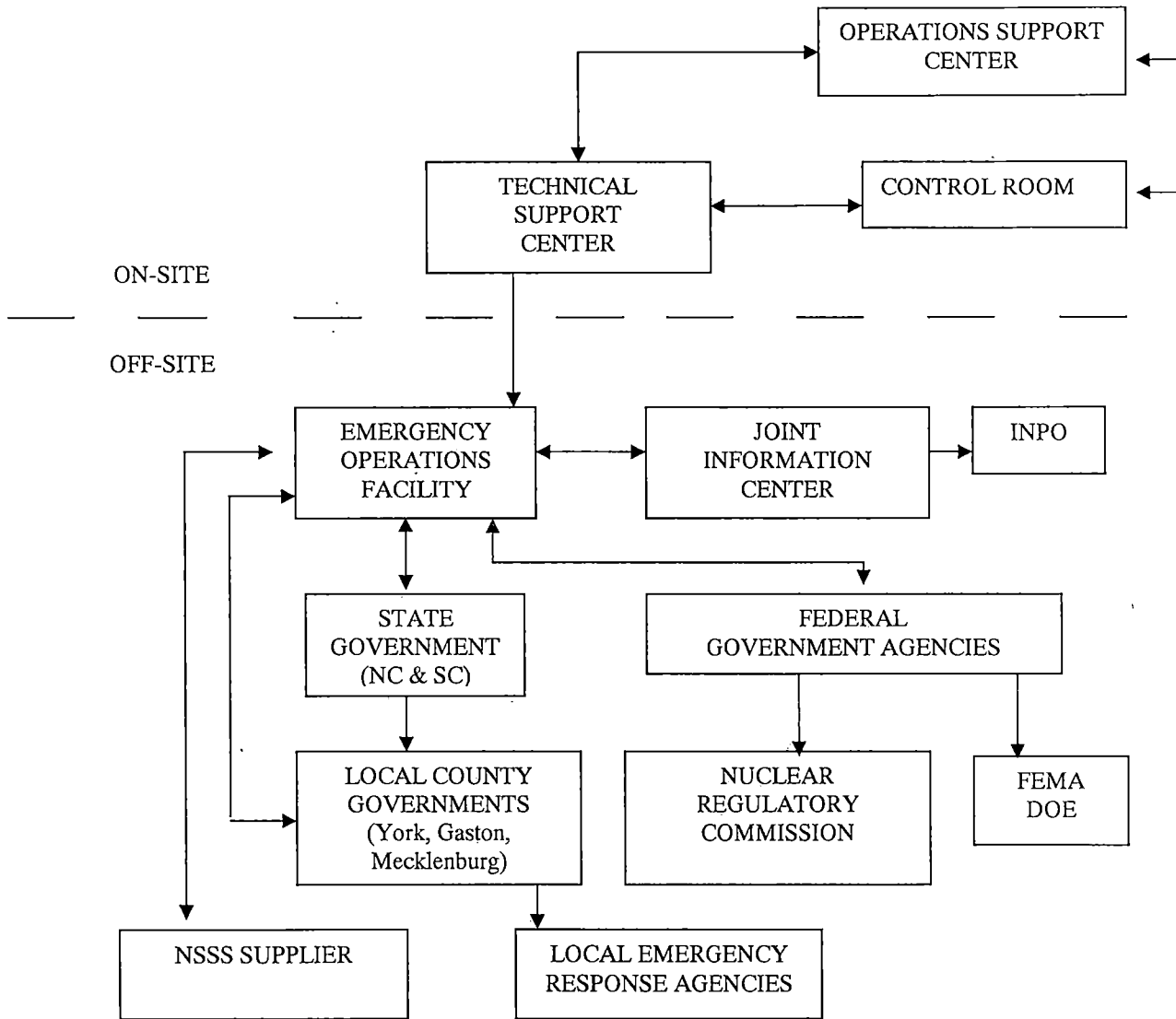


FIGURE B-4  
CATAWBA NUCLEAR STATION  
INTER-RELATIONSHIPS OF RESPONSE ORGANIZATIONS  
UNUSUAL EVENT\*



\* DOES NOT REQUIRE ACTIVATION OF ANY EMERGENCY RESPONSE ORGANIZATION

FIGURE B-5  
 CATAWBA NUCLEAR STATION  
 INTER-RELATIONSHIPS OF RESPONSE ORGANIZATIONS  
ALERT  
SITE AREA EMERGENCY  
GENERAL EMERGENCY



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Catawba Nuclear Station  
Emergency Plan  
Section C - Emergency Response Support and Resources

C. Emergency Response Support and Resources

C.1.a. Individuals Authorized to Request Federal Assistance

Environmental radiological measurements are made in the field by radiological survey teams described in AD-EP-ALL-0203. This information is used by the Radiological Assessment Manager to confirm environmental projections of doses and dose rates. If necessary to relieve Duke personnel, environmental surveillance support personnel from the DOE Radiological Assistance Plan may be requested by the Radiological Assessment Manager or the EOF Director.

C.1.b. Federal Resources - Arrival Time

DOE emergency radiological assistance is expected within 3 to 4 hours from a call for these services at Catawba. (Driving and set up time - does not consider use of helicopter or other aerial means of transport).

NRC's full team from Region 2 would be on-site within 7-8 hours from declaration of an emergency at Catawba. Some portions of their team could arrive on-site much earlier by the use of helicopter transport from Atlanta.

C.1.c. Emergency Operations Facility Resources Available to Federal Response Organizations

The following resources are available to support Federal emergency response from DOE - Savannah River.

Airfield - Charlotte/Douglas International airport (~30 - 40 minutes from station)

C.2.a State and County Representation at the Emergency Operations Facility (EOF)

Designated work areas have been provided in the EOF for EPZ state/county Emergency Management Liaisons and EPZ state Radiation Protection Liaisons.

C.2.b Licensee Representation at the Off-Site EOCs

Provisions have been made to dispatch representatives to principal off-site governmental Emergency Operations Centers (EOCs). The representatives act as liaisons to clarify the information contained in emergency notifications and provide an additional on-site link to the nuclear facility emergency response facility staffs.

C.3 Radiological Laboratories - Availability and Capability

Laboratory facilities include mobile emergency monitoring capabilities available through the SC Department of Health and Environmental Control, Bureau of Radiological Health; NC Department of Environment, Health, and Natural Resources, Division of Radiation Protection and the DOE Radiological Assistance Team. In addition, the station has

vehicles that can be set up for mobile monitoring and assessment purposes. Fixed facilities are available for gross counting and spectral analysis in the station counting laboratory and at the nearby Duke Energy Applied Sciences Center (45 miles). Other facilities within the Duke System at McGuire Nuclear Site (45 miles) and at Oconee Nuclear Site (160 miles) could provide further analysis support within a short period of time (1-4 hours). The above radiological laboratories are available on a 24 hour a day basis and could provide their services and equipment on demand.

#### C.4 Emergency Support From Other Organizations

Other support can be provided by:

- INPO Fixed Nuclear Facility, Voluntary Assistance Agreement
- Signatories
- DOE Savannah River
- Area Hospitals (see section B.9)
- Volunteer Fire Departments (see section B.9)
- Radiation Emergency Assistance Center/Training Site (REAC/TS)



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Catawba Nuclear Station  
Emergency Plan  
Section F - Emergency Communications

F. Emergency Communications

F.1.a. 24 Hour Notification Capability

In the event of an emergency at Catawba Nuclear Station, 24 hour per day notification to and activation of the state/county emergency response network is established. All state/county warning points are manned 24 hours per day. This communications link consists of the following:

- (1) Duke Energy Management Network (DEMNET) telephone system to the county and state warning points/EOCs and EOF.
- (2) Private telephone capability to the county and state warning points/EOCs.
- (3) Satellite telephone capability.
- (4) Dedicated radio networks to the county warning points/EOCs.

Communication links are available from Catawba Control Room, as shown in Figure F-1, the Technical Support Center as shown in Figure F-2 and the EOF as shown in Figures F-3 and F-4. Backup communication links can be established using the station's Local Law Enforcement Radio to York Co. to S.C. Emergency Management Division and by the Duke Energy P&T Frequency to Corporate Headquarters if required.

F.1.b. Communications With State/Local Governments

There are four means of contacting states/counties in the 10 mile EPZ.

- (1) The DEMNET System is the primary means of communication. DEMNET is a network of Ethernet phones housing small computers and a touch screen displays which are used to initiate actions associated with the use of the Emergency Response Facilities (ERFs)(Control Rooms), Technical Support Centers (TSC), Emergency Operations Facilities (EOF), Simulator Control Rooms and alternate ERFs from each of Duke Energy's nuclear plants in North and South Carolina to communicate with required Offsite Response Organizations (OROs) and with each other.
- (2) Standard telephone lines serve as a backup means of communication.
- (3) Radio systems can be used for communication among off-site monitoring teams, counties, the control room, TSC and EOF.
- (4) Satellite phone capability is also available in the Technical Support Center, Emergency Operations Facility and via a portable unit.

Three telephone lines to N.C. and S.C. are dedicated for specific tasks.

- EOF Director to the state director
- Off-Site Agency Communicator to state emergency management via DEMNET system.
- State Public Information Officer (PIO) at the Joint Information Center to the State PIO at the N.C. State Emergency Response Team (SERT).

F.1.c. Communications With Federal Organizations

The Catawba Control Room, TSC and EOF each have NRC Emergency Notification System (ENS) and the TSC and EOF each have Health Physics (HPN) capability through the Emergency Telephone System (ETS). Commercial telephone company lines provide a backup to ENS.

The Radiological Assessment Manager in the EOF has the capability to contact DOE-Savannah River for assistance through the use of standard telephone circuits.

F.1.d. Communications between Station, EOF, Local EOCs and Monitoring Teams

Provision for communications between the Catawba Control Room or TSC and the EOF, county and state EOCs is provided by the DEMNET telephone capability. The satellite phone described above is the backup as well as standard telephone lines. A separate radio system provides for communications between the Control Room, TSC and/or EOF to the radiological monitoring teams in the field. Satellite phone capability is also available in the TSC and via a portable unit.

F.1.e. Activation of Emergency Personnel

Notification, alerting and activation of emergency response personnel in the TSC, OSC, and EOF is described in Section E.2.

F.1.f. Communications between NRC, EOF and Monitoring Teams

Communications between Catawba Control Room/TSC/EOF to the NRC Operations Center is via the Emergency Telephone System (ETS) phone or private telephone. Communications from the Catawba Control Room/TSC/EOF to the regional office is via the normal private capability. Communications between the TSC/EOF and off-site monitoring teams is via the radio system described in F.1.d.

F.1.g. ERDS Data Transfer

ERDS is activated within 1 hour of the declaration of an Alert or higher emergency classification per the respective response procedure.

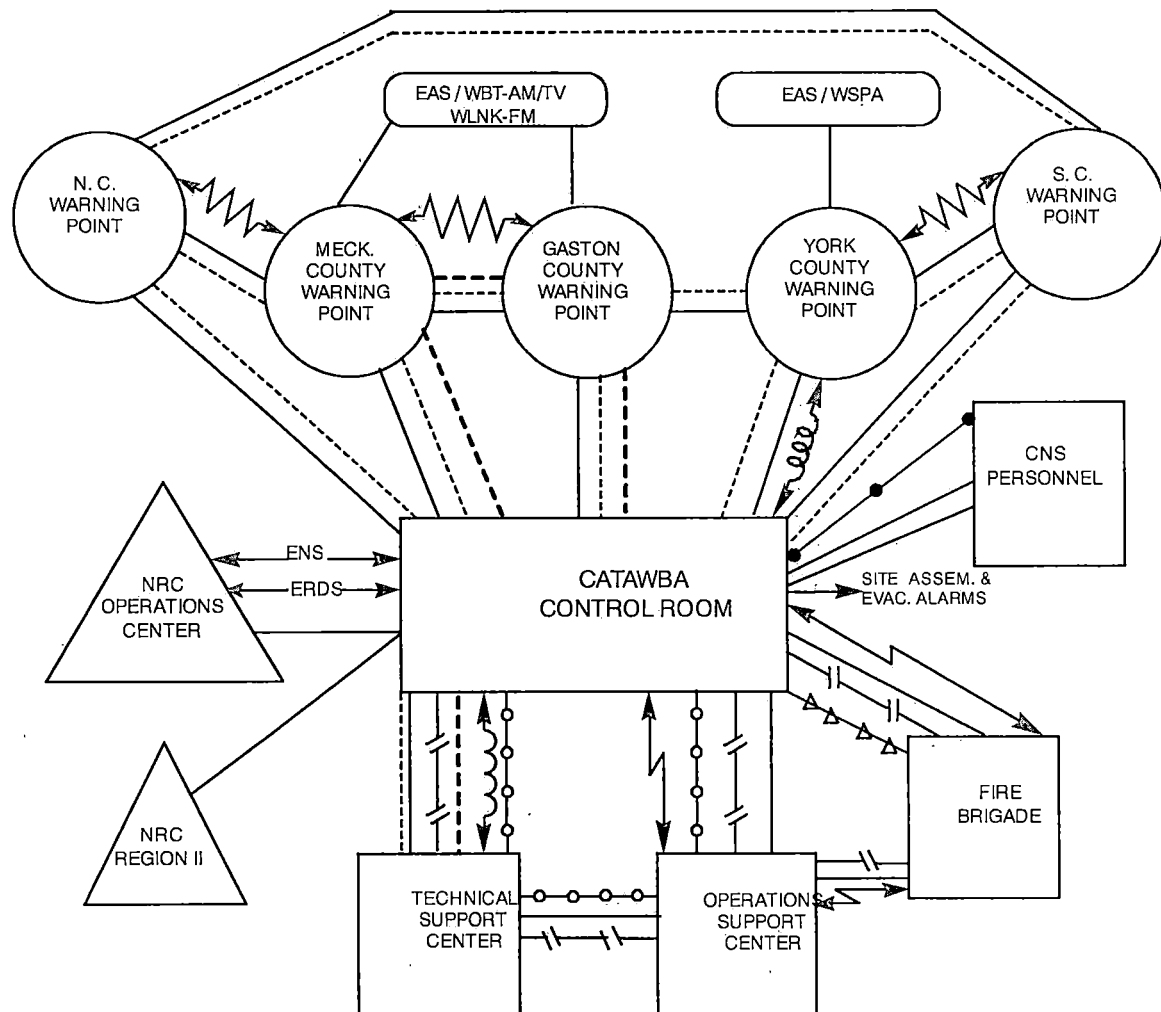
F.2. Medical Support Communications

Communications to local medical facilities is via private telephone lines from site and EOF telephones. Radio communications are possible through the York County Communication Center to ambulance and hospital facilities.

### F.3 Communications System Testing

Communications between Catawba Nuclear Station/EOF and state/local warning points are tested monthly; communications between the station and Federal emergency response facilities and states within the 50 mile ingestion pathway are conducted quarterly; communications with state/local EOC's and field assessment teams are conducted annually.

FIGURE F-1  
CATAWBA NUCLEAR STATION  
CONTROL ROOM EMERGENCY COMMUNICATIONS  
PRIOR TO TSC ACTIVATION



RADIO LINKS

- CNS SECURITY TO LLEA
- DUKE ENERGY HIGHBAND RADIO
- CNS FIRE BRIGADE
- SATELLITE PHONE

TELEPHONE

- PLANT LINE
- COMMERCIAL (DIRECT OUTSIDE LINE)
- EMERGENCY NOTIFICATION SYSTEM
- DEMNET
- INTERCOM
- PLANT PAGE
- CELL PHONES
- EMERG. RESPONSE DATA SYSTEM
- PAGERS

FIGURE F-2  
EMERGENCY COMMUNICATIONS AFTER TSC ACTIVATION  
AND DURING EOF ACTIVATION

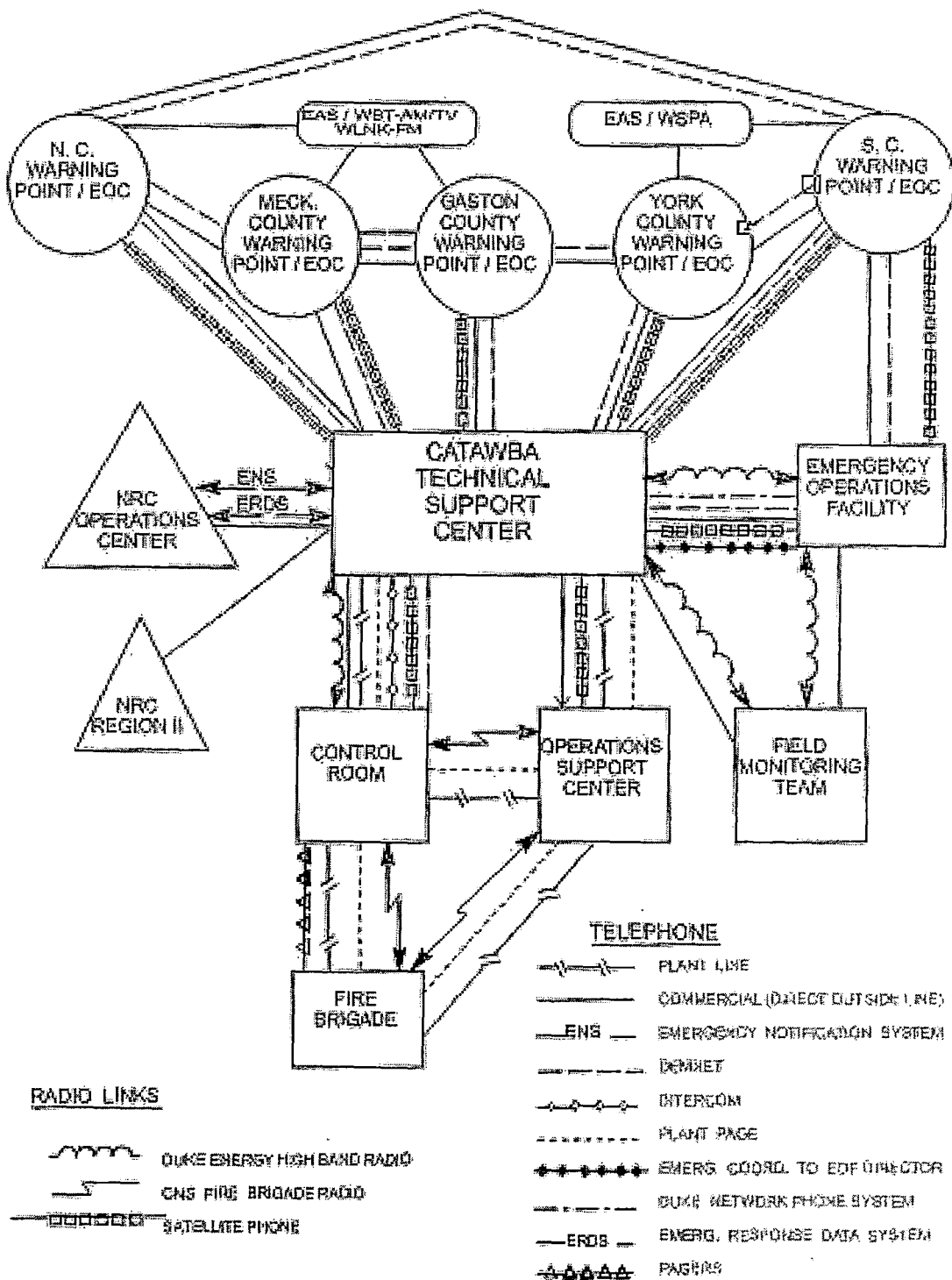
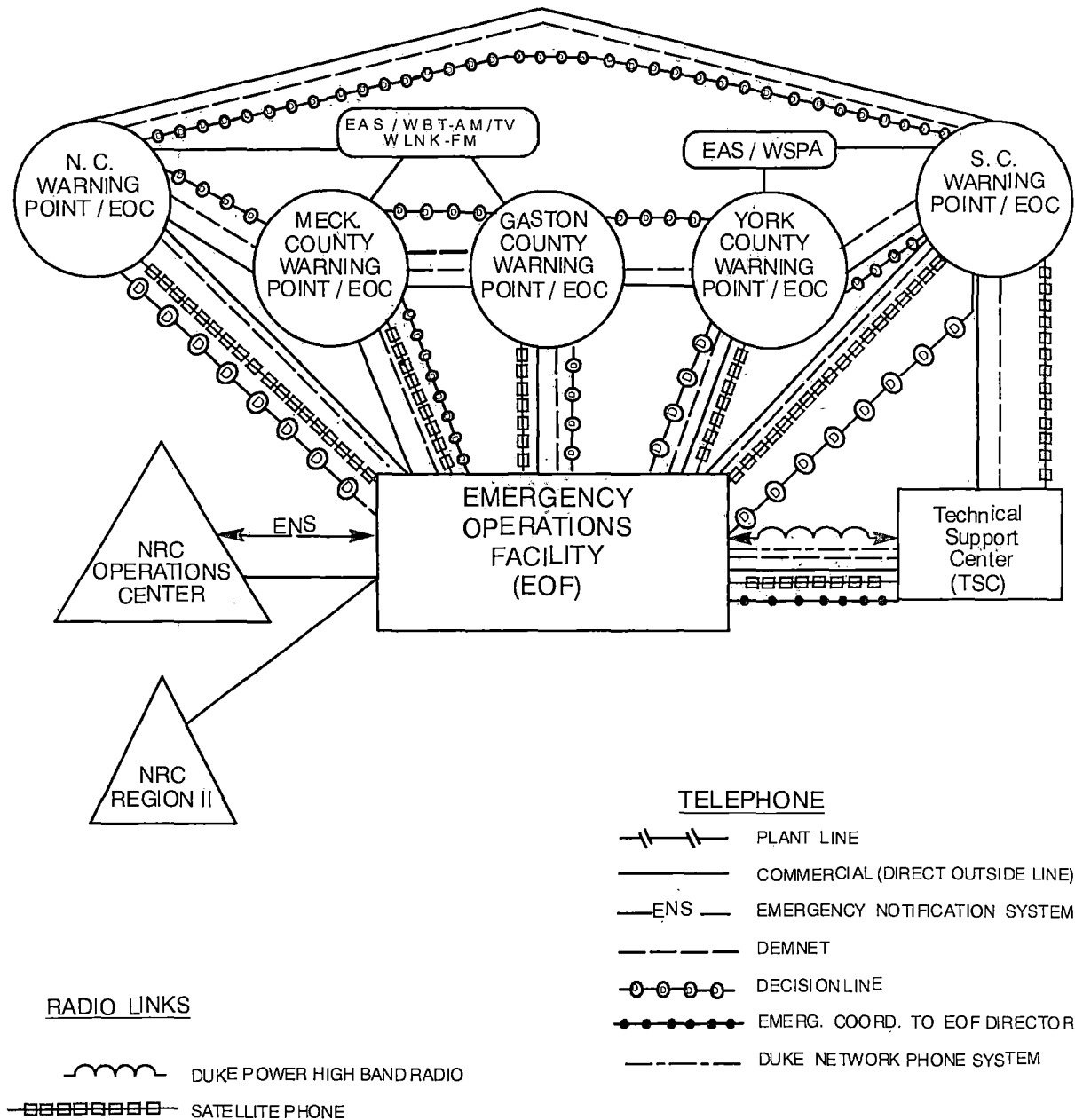
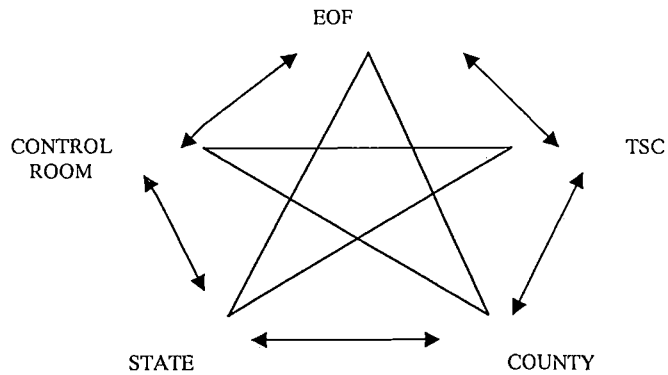


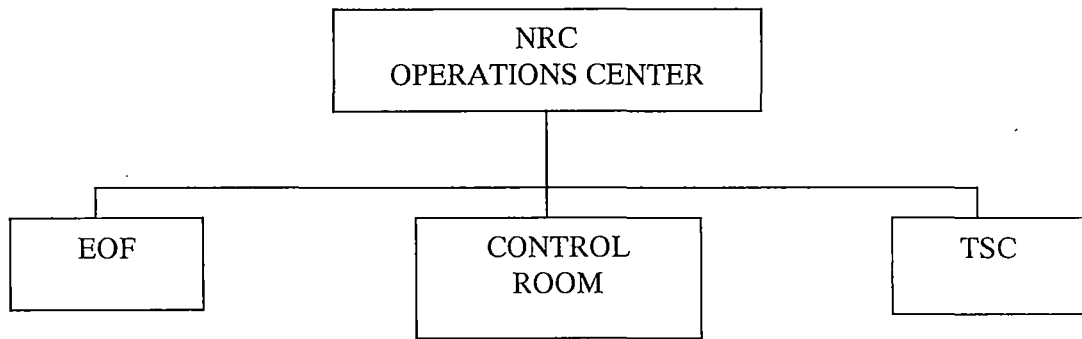
FIGURE F-3  
EMERGENCY COMMUNICATIONS DURING EOF ACTIVATION  
AND AFTER EOF ACTIVATION



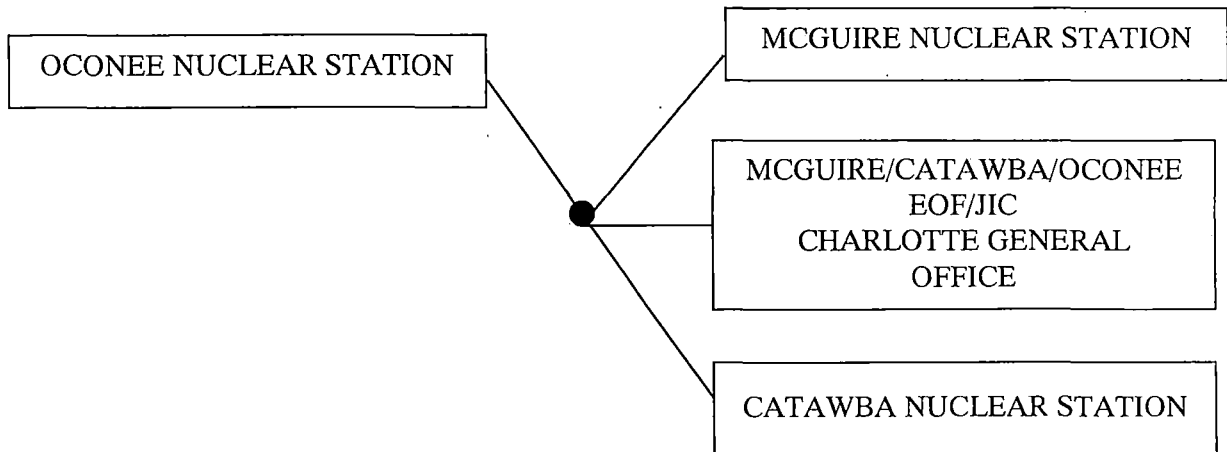
**FIGURE F-4  
EOF COMMUNICATIONS  
DEMNET PHONE SYSTEM**



**NRC EMERGENCY NOTIFICATION SYSTEM (ENS)**



**DUKE ENERGY NETWORK  
PHONE SYSTEM**





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Catawba Nuclear Station  
Emergency Plan  
Section H - Emergency Facilities and Equipment

H.     Emergency Facilities and Equipment

H.1    Technical Support Center (TSC)/Operations Support Center (OSC)

H.1.a     Control Room. The Control Room is utilized for evaluation and control of the initial phase of an emergency, including corrective actions and notification and activation of Catawba, Duke Energy, state and local emergency response organizations. The Control Room has redundant (telephone and alternate) two-way communications with emergency centers and off-site agencies. See Figure F-1 for communication scheme.

H.1.b     Technical Support Center. (Figure H-1) The Technical Support Center (TSC) is utilized for evaluation of plant status by knowledgeable plant, vendor, NRC and other support groups during an emergency. This center will also be utilized to direct the on-site and initial off-site aspects of an emergency. Anticipated occupants are defined in RP/0/A/5000/020, Technical Support Center Activation Procedure. The TSC has the following capabilities:

1.     Redundant two-way communications with the Control Room, the OSC, the Emergency Operations Facility and the Nuclear Regulatory Commission Operations Center. See Figure F-2 for communication scheme.
2.     Monitoring for direct radiation and airborne radioactive materials with local readout of radiation level and alarms if levels are exceeded.
3.     Display, printout or trend record of comprehensive data necessary to monitor reactor system status and to evaluate plant system abnormalities, in-plant and off-site radiological parameters and meteorological parameters are available. This capability is provided via the operator aid computer. Capabilities to access and display parameters, individually or in groups is provided.
4.     Ready access to as-built plant drawings such as general arrangements, flow diagrams, electrical one-lines, instrument details, etc.
5.     Radiological habitability during postulated radiological accidents to the same degree as the Control Room.
6.     Provisions for staffing by the Station Manager (Emergency Coordinator), advisors and representatives from the Station as necessary. Room is also provided for NRC personnel. Space for up to 35 persons plus instrumentation displays is provided.

The TSC is located near the Control Room, on elevation 594, in the Service Building. The TSC is within two (2) minutes walking distance from the Control Room. This is a permanent facility.

H.1.c Operations Support Center. (Figure H-2) The Operations Support Center (OSC) is that place designated for Operations and Radiation Protection, Chemistry, Maintenance, IAE, and others as necessary, to report to in an emergency condition. This center will be used to brief and prepare station personnel for work assignments in support of the emergency condition. The OSC is located in the Service Building on the 609 elevation with the OCC. The OSC has adequate capacity and supplies including provisions for respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment and communications equipment. This is a permanent facility.

## H.2 Emergency Operations Facility (EOF)

The Emergency Operations Facility (EOF) is utilized for direction and control of all emergency and recovery activities with emphasis on the coordination of off-site activities such as communications with local, state and federal agencies, and coordination of corporate and other outside support. Anticipated occupants are the EOF organization and appropriate state and federal agency representatives.

The EOF has the following capabilities:

- a. The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves.
- b. The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensees and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves.
- c. The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site.

The Common EOF in Charlotte serves as an alternate facility that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and having the following characteristics required collectively of the alternate facilities for use when onsite emergency facilities cannot be safely accessed during hostile action:

- The capability for communication with the emergency operations facility, control room, and plant security.
- The capability to perform offsite notifications.
- The capability for engineering assessment activities, including damage control team planning and preparation.

The EOF has redundant two-way communications with the Technical Support Center and appropriate off-site support agencies. (See Section F)

The EOF is located in the Energy Center at 526 South Church Street, Charlotte, North Carolina. The EOF layout and location are shown on Figures H-3 through H-5.

### H.3 State and Local Government Emergency Operations Centers

See County and State Plans.

### H.4 Activation and Staffing

Catawba emergency response facilities (TSC, OSC, EOF) are activated as required by the appropriate Emergency Response Procedure. Activation of the TSC, OSC, and EOF is required for Alert and higher emergency conditions. Timely activation and staffing of the Emergency Operations Facility is important to allow the Nuclear Station staff the ability to correct the situation with minimal interference from outside organizations. The Emergency Coordinator will perform the role and function of the EOF Director until activation of the EOF has taken place. The EOF Organization will be alerted and activated for Alert and higher emergency classifications.

### H.5 Assessment Actions

On-site monitoring systems used to initiate emergency measures are defined in Section I. Those used for conducting assessment evaluations during any emergency condition are listed below:

H.5.a Meteorological, Hydrologic and Seismic. A description of the primary meteorological measurement facility is found in Appendix 2. These basic meteorological parameters are displayed in the Control Room. (See Figure H-8, Generalized Met System).

1. During periods of primary system unavailability, an alternate source of meteorological data is established at the NWS (NATIONAL WEATHER SERVICE) office. Wind direction and speed are from standard NWS instrumentation at conventional heights.

The following information is applicable to off-site dose calculations when NWS meteorological information is being utilized:

- Wind direction from the NWS can be used in lieu of the 60 m tower wind direction indication
- Wind speed from the NWS can be used in lieu of the 10 m tower wind speed indication.
- Atmospheric stability class determination is based on the time of day as detailed in the applicable procedures
- Wind speed from the NWS can be used in lieu of the 60 m tower wind speed indication for transport considerations.

A monthly telephone contact, initiated by plant personnel, with the NWS office will be established to insure that this basic meteorological information can be accessed. See PT/0/B/4600/005A, Monthly Communications Verification.

2. The following field checks will be performed each week by plant personnel:

Wind Direction and Wind Speed Recorder

- (a) Recorder Time Accuracy
- (b) Recorder Zero and 100% Scale Marks
- (c) High and Low Test Values

Ambient Delta Temperature

- (a) Recorder Time Accuracy
- (b) Recorder Zero and 100% Scale Marks
- (c) High and Low Test Values

OAC

- (a) High and Low Test Values of Analog Points
- (b) Process controlled by OAC and meteorological processes

3. Onsite meteorological instruments will be calibrated at a frequency specified by Selected Licensee Commitments. During calibration periods, basic meteorological data, characteristic of site conditions, will be accessible from the NWS. These instruments will be calibrated in accordance with approved procedures.

Hydrologic

A hydrological description of the Catawba Nuclear Station site is located in the CNS UFSAR, Section 2.4.

Seismic

A description of the seismic monitoring instrumentation and area seismology studies are found in Catawba UFSAR, Sections 3.7 and 2.5 respectively.

- H.5.b Radiological monitors including process monitors, area monitors, post-accident monitoring equipment, effluent monitors, personnel monitoring devices, portable monitors and sampling equipment are described in various Radiation Protection procedures, the Catawba UFSAR, Emergency Plan Implementing Procedures and Safety Evaluation Report.
- H.5.c. Equipment and instrumentation are available to monitor plant parameters such as reactor coolant pressure, temperature, levels, containment pressure, temperature, humidity, sump levels, hydrogen concentrations, system flow rates, status, and line-ups. Equipment is provided in the TSC to display and trend these parameters. The Operator Aid Computer is the source of this information.
- H.5.d Fire detection devices of the ionization-chamber and thermal type are located throughout the station.

## H.6 Data, Monitoring Equipment and Analysis Facilities

Provisions have been made and exist to obtain data from off-site agencies or monitoring equipment and analysis facilities. The provisions are described below:

- a. Meteorological information is available from the National Weather Service as described in Section H.5.a. Monitoring of the Catawba River for hydrologic data is conducted within the Duke System of dams and hydro-electric facilities. Seismic data is available from the U.S. Geological Survey Office as provided for in the Catawba Procedure RP/0/A/5000/007, Natural Disaster and Earthquake.
- b. Environmental Radiological Monitoring equipment includes five radioiodine and particulate continuous air samplers and forty thermoluminescent dosimeters. The thermoluminescent dosimeters are posted and collected in accordance with Table 1, Branch Technical Position, Rev. 1 of November, 1979. The Catawba Nuclear Station Offsite Dose Calculation Manual (ODCM) lists locations of posted thermoluminescent dosimeters and air samplers.
- c. Radiological Laboratories - See Section C.3.

## H.7 Off-site Radiological Monitoring

As described in H.6.b above.

## H.8 Meteorology Instrumentation and Procedures

See Section H.5.a

## H.9 Operations Support Center

See Section H.1.c.

## H.10 Emergency Equipment/Instrumentation Inspection, Inventory, Operational Check, Calibration

Catawba Procedure HP/0/B/1000/006, Emergency Equipment Functional Check and Inventory, defines the location, inspection, inventory and operational checks required of emergency equipment. Various Radiation Protection procedures define the criteria for calibration of all monitoring equipment located in the emergency kits.

- H.11 Radiological Emergency kits are described in HP/0/B/1000/006, Emergency Equipment Functional Check & Inventory. TSC emergency kit (non-radiological) contents are referenced in PT/0/B/4600/004.

## H.12 Receipt and Analysis of Field Monitoring Data

Duke Energy's Emergency Operations Facility (Radiological Assessment Manager) is designated the central point for the receipt of off-site monitoring data results and sample media analysis results collected by Duke personnel. Resources exist within the organization to evaluate the information and make recommendations based upon the evaluations. The Radiological Assessment Manager's group will perform these evaluations and make recommendations to the EOF Director for protective actions. The EOF Director is the individual responsible for making protective action recommendations to off-site agencies after activation of the EOF.

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Rev. 16-1  
March 2016



**FIGURE H-2**  
**DUKE ENERGY**  
**Catawba Nuclear Site Operations Support Center**

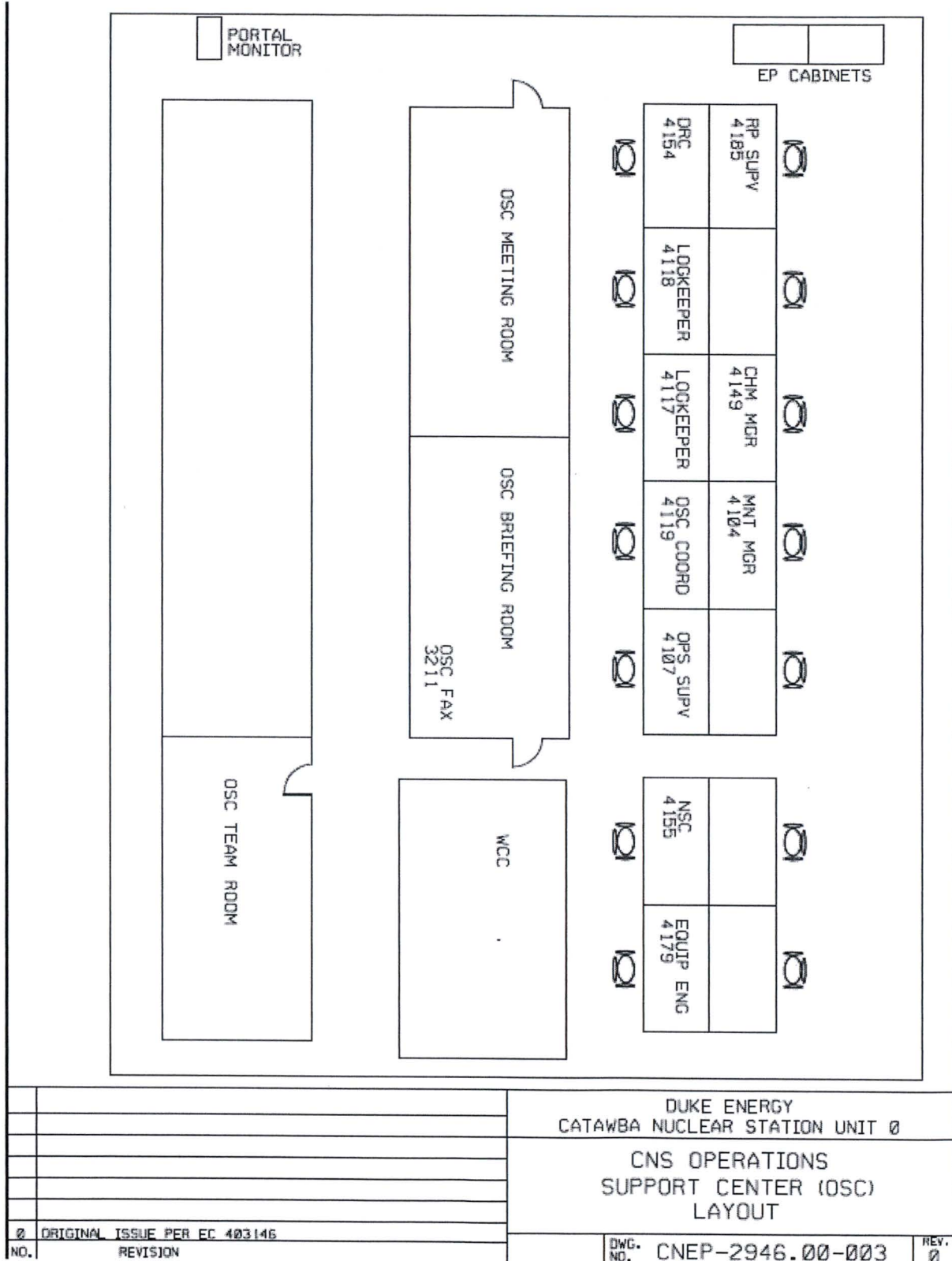
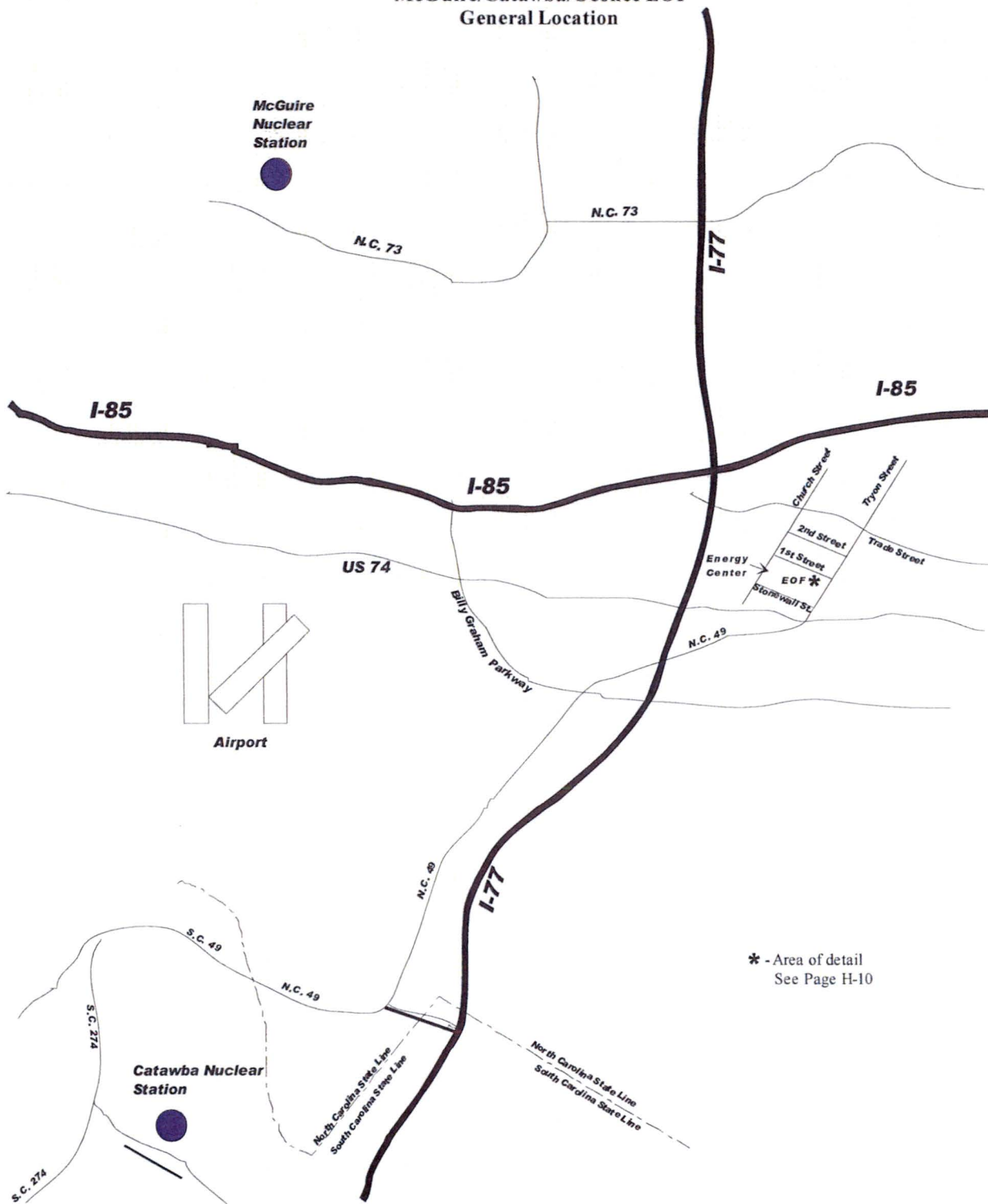


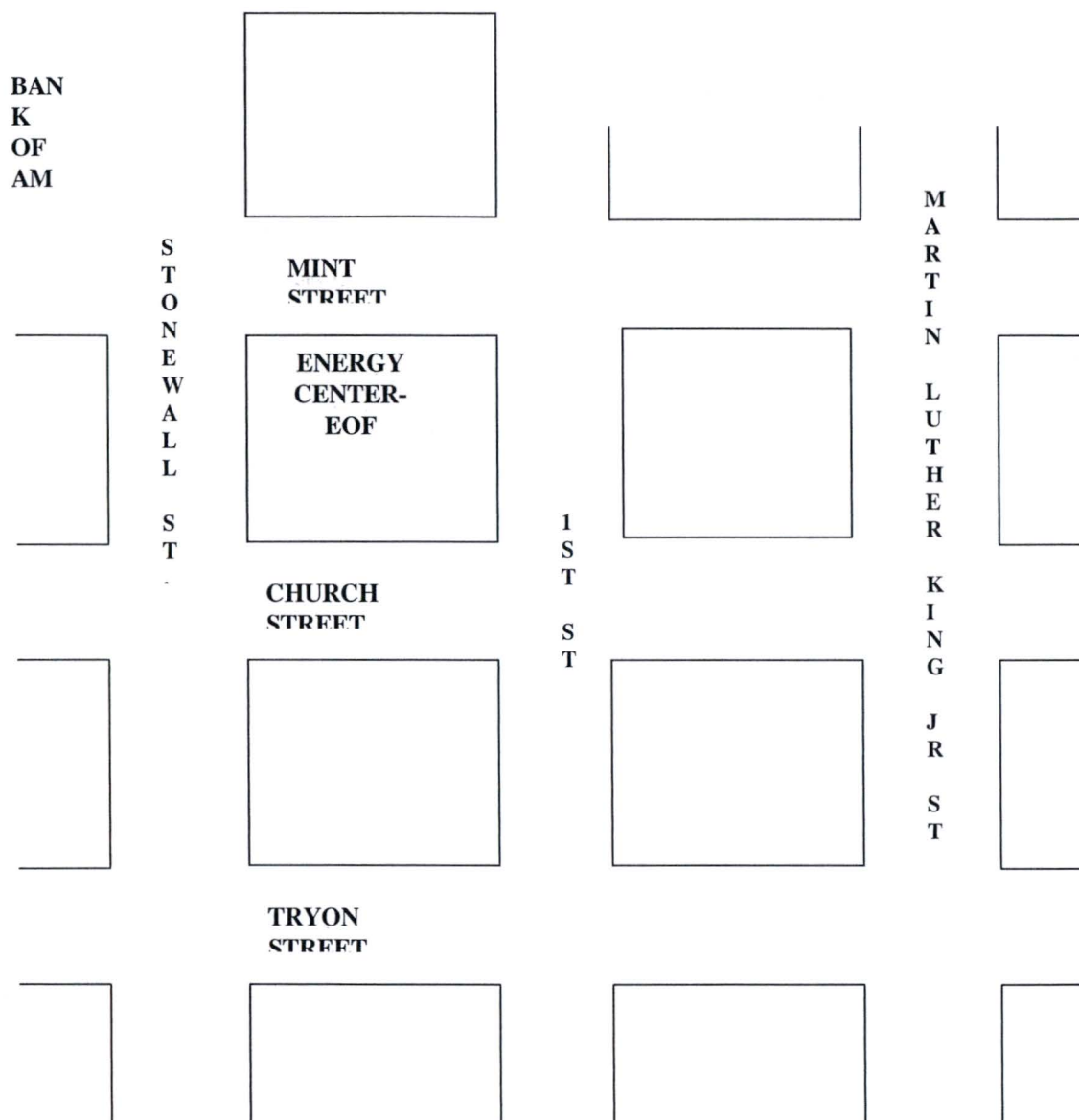
Figure H-3  
 Duke Energy  
 Emergency Response Facility  
 McGuire/Catawba/Oconee EOF  
 General Location



**Figure H-4  
DUKE ENERGY  
GENERAL OFFICE RESPONSE FACILITY**

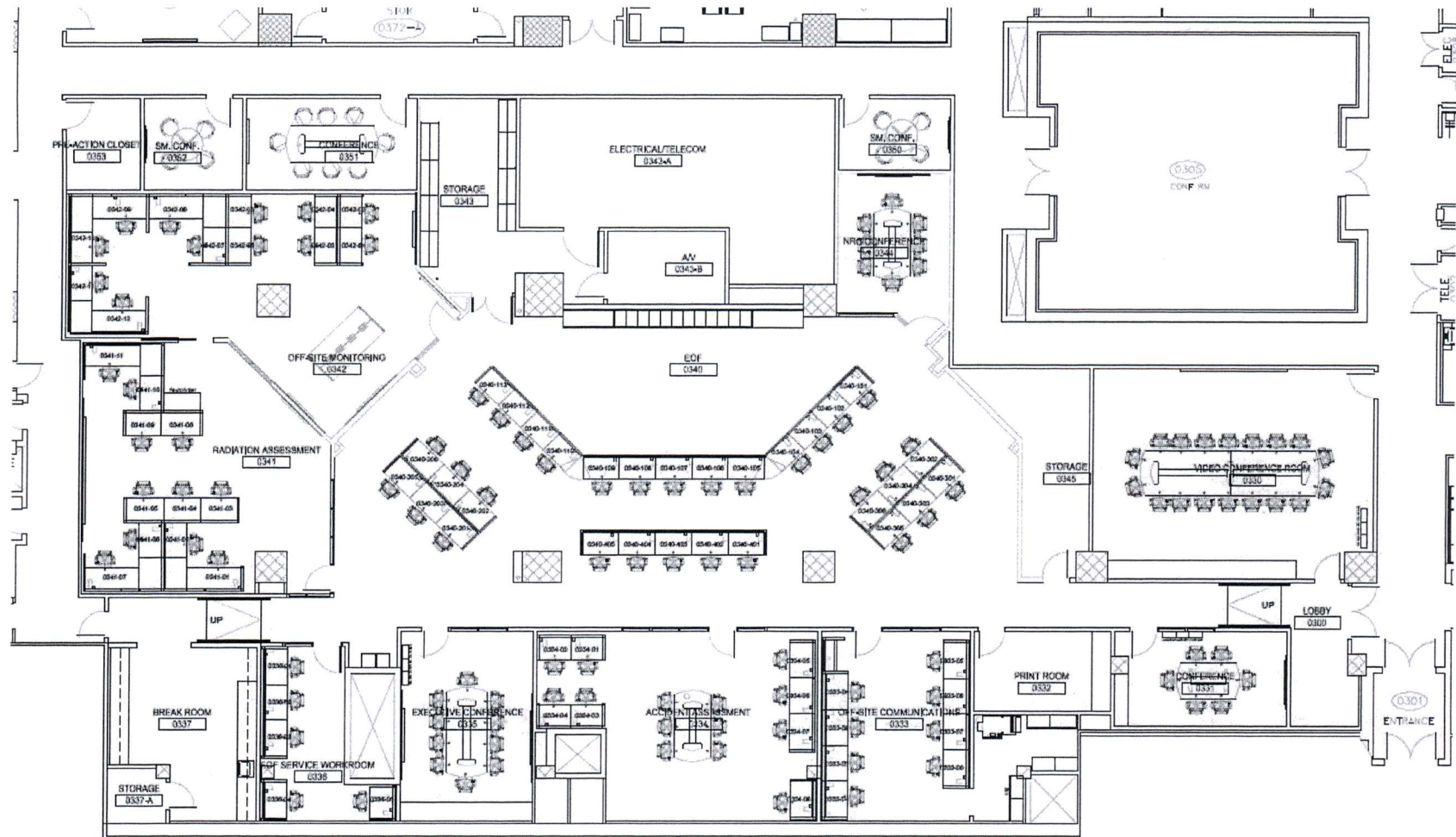
**McGUIRE/CATAWBA/OCONEE EOF  
SPECIFIC LOCATION**

**GENERAL OFFICE BUILDING LAYOUT - CHARLOTTE, NC**

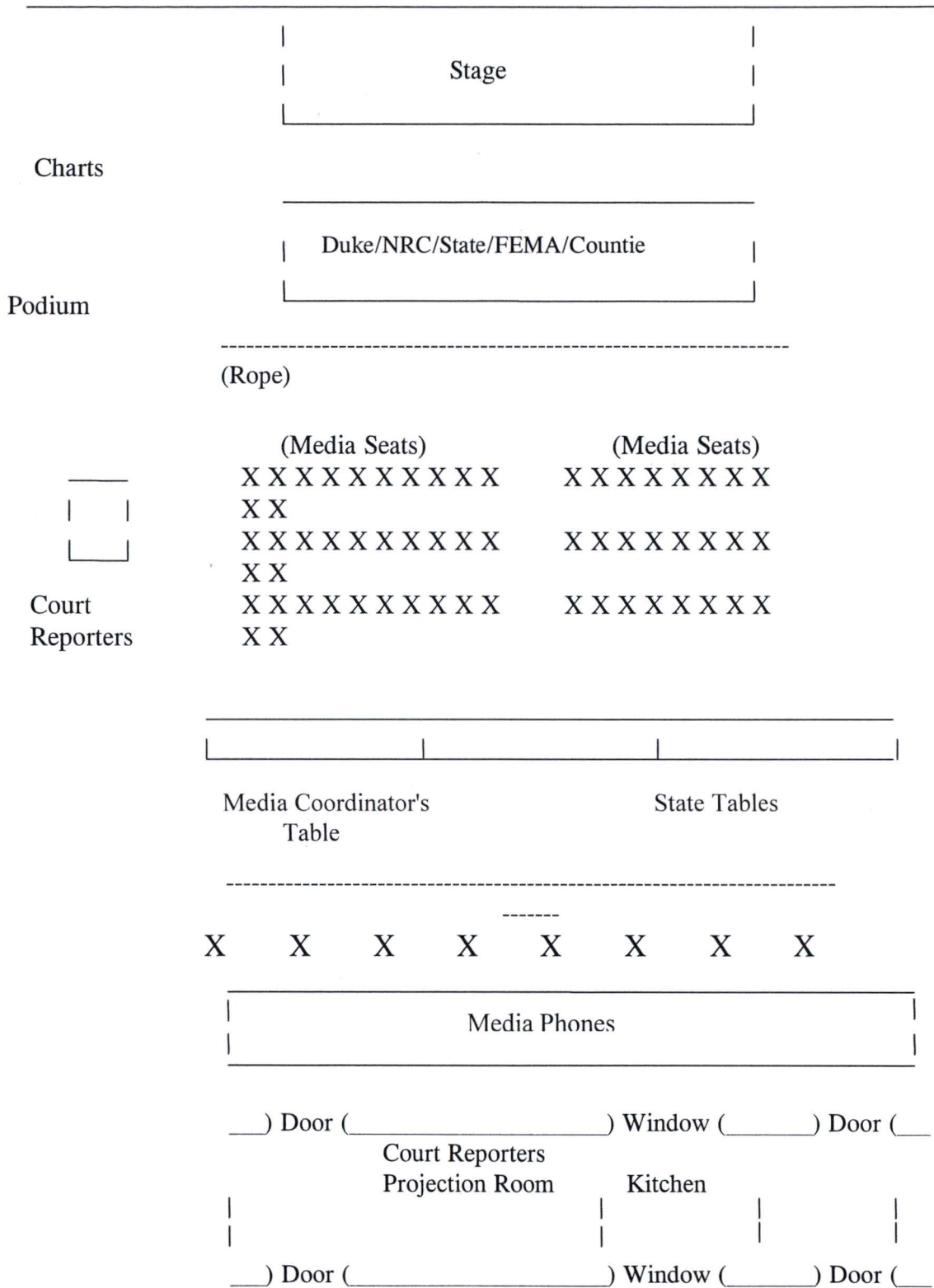


**The Media Center & Joint Information Center are in the Energy Center on the first floor. The EOF is in the Energy Center on the third floor**

Figure H-5  
DUKE ENERGY  
EOF General Arrangement

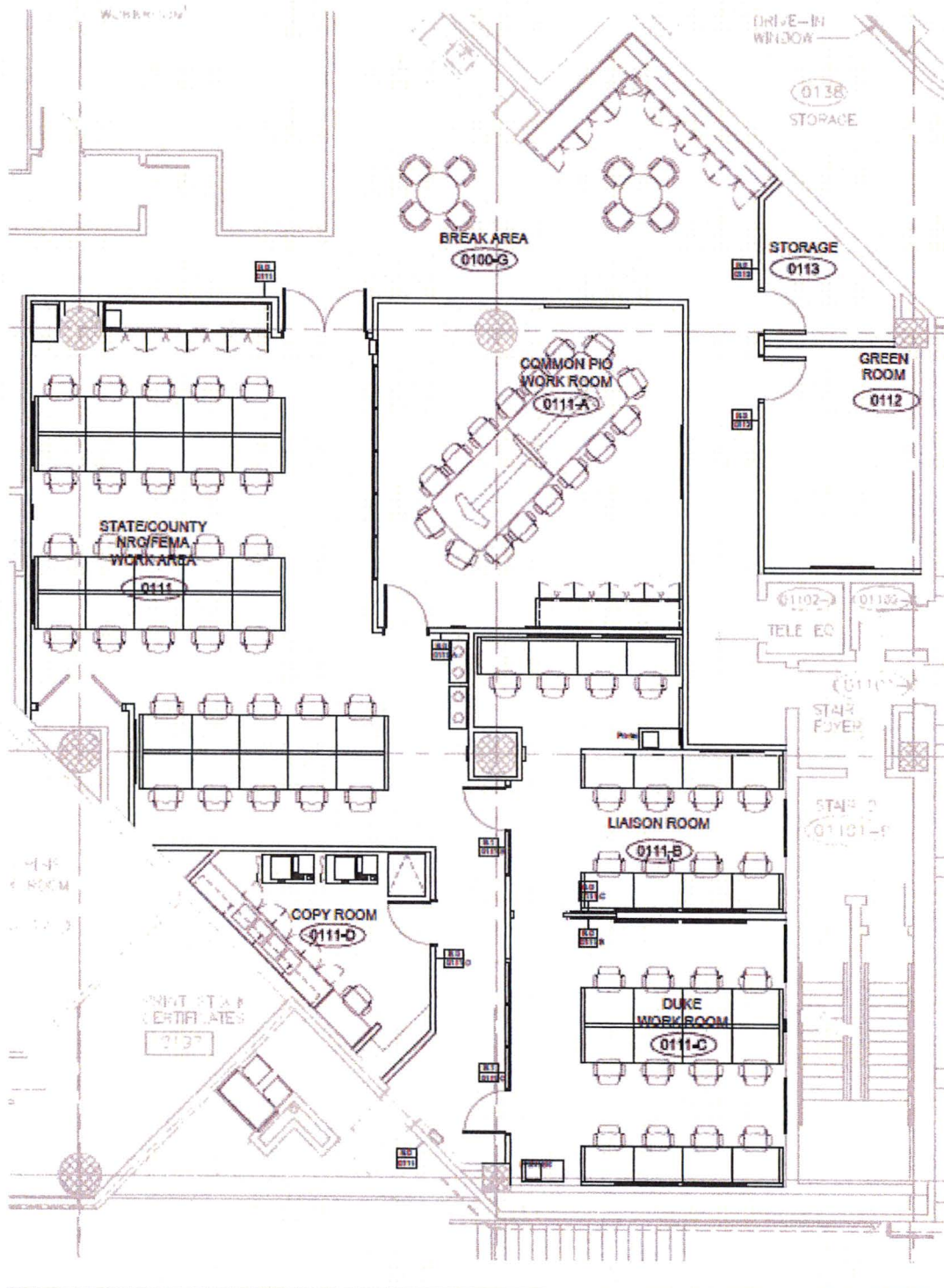


**FIGURE H-6  
DUKE ENERGY  
MEDIA CENTER**

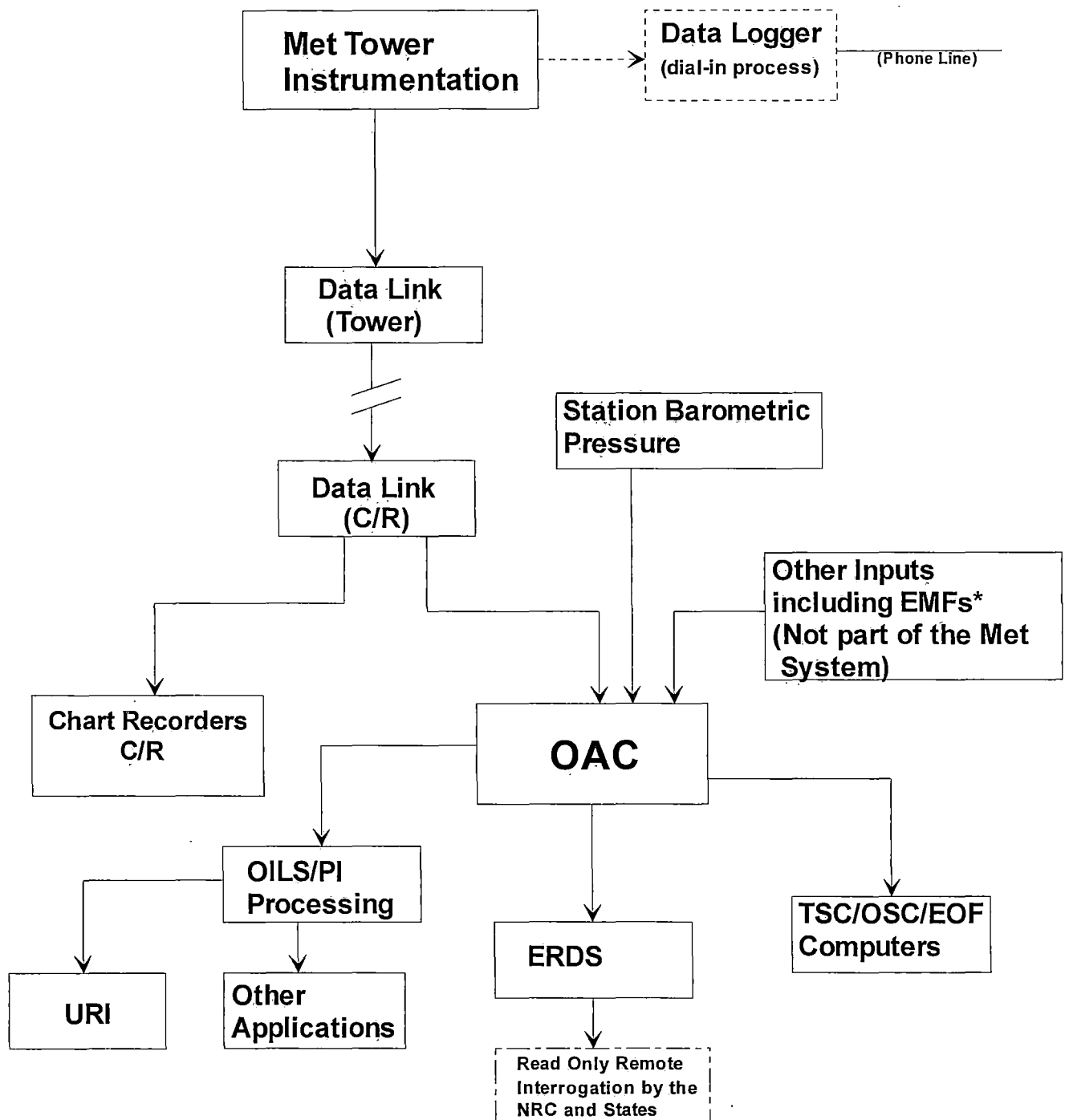




**FIGURE H-7  
DUKE ENERGY  
JOINT INFORMATION CENTER (JIC)**



**FIGURE H-8  
CATAWBA NUCLEAR SITE  
GENERALIZED MET SYSTEM**



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Catawba Nuclear Station  
Emergency Plan  
Section N - Exercises and Drills

N. EXERCISES AND DRILLS

N.1.a Exercises

Catawba Nuclear Station will conduct emergency exercises in accordance with requirements of 10CFR50, Appendix E.

The Emergency Operations Facility will participate in all exercises involving full participation by the affected state or local governments

N.1.b Exercise Scenario Response

The exercises will be designed to test the integrated capability of those involved and a major portion of the basic elements existing within the plans and organizations. The scenario for these exercises will be varied from exercise to exercise such that all major elements of the plans and organizations will be tested within an eight-year exercise cycle. The exercise will be initiated at various times of the day, but in every eight calendar year exercise cycle, one exercise will begin between 6:00 P.M. and 4:00 A.M.

N.2 Drills

Catawba Nuclear Station will conduct drills in accordance with requirements of 10CFR50, Appendix E. Drills shall be conducted to test, develop and maintain skills in a particular operation. Drills may be a component of an exercise. Drills will be conducted and evaluated by a designated drill director. Drills will be held in accordance with PT/O/B/4600/006 and PD-EP-ALL-0800, Drills and Exercises, AD-EP-ALL-0801, Design and Development of Drills and Exercises, AD-EP-ALL-0802, Conducting Drills and Exercises and AD-EP-ALL-0803, Evaluation and Critique of Drills and Exercises. (PIP G-15-0258)

N.2.a Communications

1. Monthly Checks are conducted with the states of North and South Carolina and with York, Mecklenburg and Gaston Counties.

2. Monthly Checks are conducted with the NRC Headquarters from the Control Room, TSC, and EOF. Also monthly calls to the NRC Region II Operations Center and National Weather Service will be made to ensure accessibility.
3. Quarterly Checks with Federal emergency response organizations are considered complete with the monthly call to the NRC. The states in the ingestion pathway are contacted in the monthly call to North & South Carolina.
4. Annual Communications Checks are performed between the Control Room, the TSC, and the EOF; North and South Carolina EOCs; York, Mecklenburg, and Gaston County EOCs and the field monitoring team.
5. Annual Checks are conducted with Federal emergency response organizations, Dept. of Energy's Savannah River Plant and REAC/TS in Oak Ridge, Tenn. See PT/0/B/4600/005C, Annual Communications Verification.

N.2.b Fire drills shall be conducted in accordance with Nuclear System Directive (NSD) 112, (Fire Brigade Organization, Training and Responsibilities), AD-EG-ALL-1530 (Fire Brigade Training) and AD-EG-ALL-1531 (Selection, Care and Maintenance of Firefighting Ensembles).

N.2.c Medical emergency drills involving a simulated contaminated and injured individual which contains provisions for participation by the local ambulance service shall be conducted annually. The off-site portion of the medical drill may be performed as part of the required exercise.

N.2.d Station environs and radiological monitoring drills (on-site and off-site) shall be conducted annually. These drills shall include collection and analysis of all sample media (e.g. water, vegetation, soil and air).

N.2.e Radiation Protection drills shall be conducted semi-annually which involve response to and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment. Analysis of samples may be simulated in Radiation Protection drills.

NOTES: 1. Due to ALARA considerations actual elevated samples will not be used in drills.

2. Radiation Protection and Chemistry personnel perform analyses of similar nature routinely and therefore are not required to perform the analysis for drills.

### N.3 Exercise and Drill Execution

The Emergency Preparedness Group is responsible for the overall development and direction of the exercise. An Exercise Director and a key group of controllers will develop the exercise scenario, exercise messages, and simulated data for the station and off-site areas. The Exercise Director will, for each exercise, develop an exercise plan. This plan will include objectives of the exercise and evaluation criteria, the date, time, place, and participating organizations, the exercise scenario, a narrative summary of the event including such things as emergency classification at various times in the simulated accident, off-site assistance, some detail on plant conditions, and a description of the arrangements for official observers.

### N.4 Exercise Critique

A critique will be held following each exercise. The critique will be a closed session between Duke and the Nuclear Regulatory Commission. During the critique, the Emergency Preparedness Manager, the Exercise Director, the NRC and other official observers from state, federal or local governments will make preliminary evaluations of on-site and corporate emergency response.

Critiques are held after each drill. Drill critiques are open to all drill participants, drill evaluators and drill observers.

### N.5 Critique Action Items

The verbal evaluations made during the critique and any follow-up written evaluation will be compiled using the Corrective Action Program (CAP). CAP will also be used to assign corrective actions and expected completion dates to the appropriate groups. The Emergency Preparedness Manager acting under the authority of the Site Vice President will ensure resolution of each item.

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DUKE ENERGY  
CATAWBA NUCLEAR STATION

APPENDIX INDEX

Appendix 1	Definitions
Appendix 2	Meteorological System Description
Appendix 3	Alert and Notification System Description
Appendix 4	Evacuation Time Estimates
Appendix 5	Agreement Letters

## APPENDIX 1

### 1.0 DEFINITIONS

#### AFFECTED PERSONS

Persons who have received radiation exposure or have been physically injured as a result of an accident to a degree requiring special attention as individuals, e.g., decontamination, first aid or medical services.

#### ALERT

Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the EPA protection action guideline exposure levels.

ALL (As relates to Operating Mode Applicability)  
Modes 1,2,3,4,5,6 and No Mode (Defueled)

#### ANNUAL

For periodic emergency planning requirements, annual is defined as twelve months with a maximum interval of 456 days.

#### ASSESSMENT ACTION

Those actions taken during or after an accident to obtain and process information that is necessary to make decisions to implement specific emergency measures.

#### BIENNIAL

For periodic emergency planning requirements, biennial is defined as at least once every two years, with a maximum interval of 912 days. (Note that this does not apply to the scheduling of biennial exercises. An exercise can occur at any time during the second calendar year after the previous exercise.)

#### BOMB

Refers to an explosive device suspected of having sufficient force to damage plant systems or structures.

#### CARF

Containment Air Return Fan

#### CIVIL DISTURBANCE

A group of ten (10) or more people violently protesting station operations or activities at the site. A civil disturbance is considered to be violent when force has been used in an attempt to injure site personnel or damage plant property.

#### CORRECTIVE ACTIONS

Emergency measures taken to ameliorate or terminate an emergency situation at or near the source of the problem to prevent an uncontrolled release of radioactive material or to reduce the magnitude of the release, e.g., shutting down equipment, fire-fighting, repair and damage control.

### CREDIBLE THREAT

A threat should be considered credible when:

- Physical evidence supporting the threat exists.
- Information independent (law enforcement) from the actual threat message exists that supports the threat.
- A specific group or organization claims responsibility for the threat.

### DEGRADING

Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage, frequency) are trending unfavorably away from expected or desired values AND plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.
- Environmental site conditions (ex., wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire) impacting plant operations or personnel safety are worsening AND plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

### DRILL

A drill is a supervised instruction period aimed at testing, developing, and maintaining skills in a particular operation.

### EMERGENCY ACTION LEVELS (EALs)

A pre-determined, site-specific, observable threshold for a plant Initiating Condition that places the plant in a given emergency class. An EAL can be: an instrument reading; an equipment status indicator; a measurable parameter (onsite or offsite); a discrete, observable event; results of analyses; entry into specific emergency operating procedures; or another phenomenon which, if it occurs, indicates entry into a particular emergency class.

### EMERGENCY OPERATIONS FACILITY (EOF)

The Emergency Operations Facility is the facility utilized for direction and control of all emergency and recovery activities with emphasis on the coordination of off-site activities such as dispatching mobile emergency monitoring teams, communications with local, state and federal agencies, and coordination of corporate and other outside support.

### EMERGENCY PLANNING ZONE (EPZ)

The area for which planning is needed to assure that prompt and effective actions can be taken to protect the public in the event of an accident. The plume exposure EPZ is about 10 miles in radius and the ingestion exposure EPZ is about 50 miles in radius.

### EMERGENCY RELEASE

Any unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to a declared emergency.

### EPA PAG

Environmental Protection Agency Protective Action Guidelines for exposure to a release of radioactive material.

### EXCLUSION AREA

The nuclear station property, including the site, out to a radius of 2500 feet that meets the 10CFR100 definition.

### EXPLOSION

A rapid, violent unconfined combustion or a catastrophic failure of pressurized equipment (e.g., a steamline or feedwater line break) that imparts energy sufficient to potentially damage or creates shrapnel to actually damage permanent structures, systems or components. An electrical breaker flash that creates shrapnel and results in damage to other components beyond scorching should also be considered.

### EXERCISE

An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations.

### EXTORTION

An attempt to cause an action at the site by threat of force.

### FIRE

Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute fires. Observation of flames is preferred but is NOT required if large quantities of smoke and heat are observed. An electrical breaker flash that creates high temperatures for a short duration and merely localized scorching to that breaker and its compartment should not be considered a fire.

### FRESHLY OFF-LOADED REACTOR CORE

The complete removal and relocation of all fuel assemblies from the reactor core and placed in the spent fuel pool. (Typical of a "No Mode" operation during a refuel outage that allows safety system maintenance to occur and results in maximum decay heat load in the spent fuel pool system.)

### FUNCTIONAL

A component is fully capable of meeting its design function. It would be declared INOPERABLE if unable to meet Technical Specifications.

### GENERAL EMERGENCY

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA protective action guideline exposure levels offsite for more than the immediate site area.

### HOSTAGE

A person or object held as leverage against the site to ensure demands will be met by the site.



### HOSTILE ACTION

An act toward an NPP or its personnel that includes the use of violent force to destroy equipment, take **HOSTAGES**, and/or intimidates the licensee to achieve an end. This includes attack by air, land or water using guns, explosives, **PROJECTILES**, vehicles or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. **HOSTILE ACTION** should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP. Non-terrorism-based EALs should be used to address such activities (e.g., violent acts between individuals in the **OWNER CONTROLLED AREA**.)

### HOSTILE FORCE

One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming or causing destruction.

### IMMINENT

Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur. Where **IMMINENT** time frames are specified, they shall apply.

### IMPROVING

Plant conditions involve at least one of the following:

- Plant parameters (ex., temperature, pressure, level, voltage, frequency) are trending favorably toward expected or desire values **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.
- Environmental site conditions (ex., wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire) have become less of a threat to plant operations or personnel safety **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

### INGESTION EXPOSURE PATHWAY

The principle exposure from this pathway would be from ingestion of contaminated water or foods such as milk or fresh vegetables. The time of potential exposure could range in length from hours to months.

### INOPERABLE

A component does not meet Technical Specifications. The component may be functional, capable of meeting its design.

### INABILITY TO DIRECTLY MONITOR

Operational Aid Computer data points are unavailable or gauges/panel indications are not readily available to the operator.

### INTRUSION

A person(s) present in a specified area without authorization. Discovery of a **BOMB** in a specified area is indication of **INTRUSION** into that area by a **HOSTILE FORCE**.

ISFSI

Independent Spent Fuel Storage Installation - Includes the components approved for loading and storage of spent fuel assemblies.

LOSS

A component is INOPERABLE and not FUNCTIONAL.

MONTHLY

For periodic emergency planning requirements, monthly is defined as once each month, with a maximum interval of 38 days.

NO MODE

Defueled.

OPERATIONAL SUPPORT CENTER (OSC)

In the event of an emergency, shift support personnel (e.g., auxiliary operators and technicians) other than those required and allowed in the control room shall report to this center for further orders and assignment.

OWNER CONTROLLED AREA (OCA)

Area outside the protected area fence that immediately surrounds the plant. Access to this area is generally restricted to those entering on official business.

PLUME EXPOSURE PATHWAY

The principle exposure sources from this pathway are (a) external exposure to gamma radiation from the plume and from deposited material and (b) inhalation exposure from the passing radioactive plume. The time of potential exposure could range from hours to days.

POPULATION-AT-RISK

Those persons for whom protective actions are being or would be taken.

PROJECTILE

An object directed toward an NPP that could cause concern for its continued operability, reliability or personnel safety.

PROLONGED

A duration beyond normal limits, defined as "greater than 15 minutes" or as determined by the judgment of the Emergency Coordinator.

PROTECTED AREA

Typically, the site specific area which normally encompasses all controlled areas within the security **PROTECTED AREA** fence.

PROTECTIVE ACTIONS

Those emergency measures taken after an uncontrolled release of radioactive materials has occurred for the purpose of preventing or minimizing radiological exposures to persons that would be likely to occur if the actions were not taken.

### PROTECTIVE ACTION GUIDES (PAG)

Projected radiological dose or dose-commitment values to individuals in the general population that warrant protective action following a release of radioactive material. Protective actions would be warranted provided the reduction in individual dose expected to be achieved by carrying out the preventive action is not offset by excessive risks to individual safety in taking the protective action. The PAG does not include the dose that has unavoidably occurred prior to the assessment.

### QUARTERLY

For periodic emergency planning requirements, quarterly is defined as once every three months, with a maximum interval of 112 days.

### REACTOR COOLANT SYSTEM (RCS/NCS) LEAKAGE

RCS Operational Leakage as defined in the Technical Specification Basis B 3.4.13.

### RECOVERY ACTIONS

Those actions taken after the emergency to restore affected property as nearly as practicable to its pre-emergency condition.

### RUPTURED (As relates to Steam Generator)

Existence of primary to secondary leakage of a magnitude sufficient to require or cause a reactor trip and safety injection.

### SABOTAGE

Deliberate damage, misalignment or misoperation of plant equipment with the intent to render the equipment unavailable. Equipment found tampered with or damaged due to malicious mischief may not meet the definition of **SABOTAGE** until this determination is made by security supervision.

### SECURITY CONDITION

Any Security Event as listed in the approved security contingency plan that constitutes a threat/compromise to site security, threat/risk to site personnel or a potential degradation to the level of safety of the plant. A **SECURITY CONDITION** does not involve a **HOSTILE ACTION**.

### SEMI-ANNUAL

For periodic emergency planning requirements, semi-annual is defined as once every 6 months, with a maximum interval of 228 days.

### SIGNIFICANT PLANT TRANSIENT

An unplanned event involving one or more of the following: (1) Automatic turbine runback >25% thermal reactor power, (2) Electrical load rejection >25% full electrical load; (3) Reactor Trip, (4) Safety Injection, (5) Thermal power oscillations >10%.

### SITE

That part of the nuclear station property consisting of the Reactor, Auxiliary, Turbine, Service Buildings and grounds, contained within the outer security area fence.

#### SITE AREA EMERGENCY

Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to the equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.

#### SITE BOUNDARY

That area, including the protected area, in which Duke Energy has the authority to control all activities, including exclusion or removal of personnel and property.

#### SLC

Selected Licensee Commitments.

#### STABLE

Plant conditions are neither degrading nor improving.

#### SUSTAINED

A duration of time long enough to confirm that the CSF is valid (not momentary).

#### TECHNICAL SUPPORT CENTER (TSC)

This on-site center is for use by plant management, technical and engineering support personnel. In an emergency, this center shall be used for assessment of plant status and potential off-site impact in support of the control room command and control function.

#### TERMINATION

Exiting the emergency condition.

#### TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE)

The sum of external dose exposure to radioactive plume, to radionuclides deposited on the ground by the plume, and the internal exposure inhaled radionuclides deposited in the body.

#### TOXIC GAS

A gas that is dangerous to life or health by reason of inhalation or skin contact (e.g. chlorine).

#### UNCONTROLLED

Event is not the result of planned actions by the plant staff.

#### UNPLANNED

An event or action is UNPLANNED if it is not the expected result of normal operations, testing or maintenance. Events that result in corrective or mitigative actions being taken in accordance with abnormal or emergency procedures are UNPLANNED.

### UNUSUAL EVENT

Events are in process or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

### VALID

An indication or report or condition is considered to be VALID when it is conclusively verified by: (1) an instrument channel check, or (2) indications on related or redundant instrumentation, or (3) by direct observation by plant personnel such that doubt related to the instrument's operability, the condition's existence or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

### VIOLENT

Force has been used in an attempt to injure site personnel or damage plant property.

### VISIBLE DAMAGE

Damage to equipment or structure that is readily observable without measurements, testing or analyses. Damage is sufficient to cause concern regarding the continued operability or reliability of affected structure, system, or component. Example damage: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering.

### VITAL AREA

Areas within the PROTECTED AREA that house equipment important for nuclear safety. Access to a VITAL AREA is allowed only if an individual has been authorized to be in that area per the security plant. Therefore, VITAL AREA is a security term.

### WEEKLY

For periodic emergency planning requirements, weekly is defined as once every 7 days, with a maximum interval of 9 days.

## APPENDIX 2 CATAWBA NUCLEAR STATION METEOROLOGICAL PROGRAM

### INTRODUCTION

In response to guidance provided by NUREG-0654, Revision 1 and supporting documents, Regulatory Guide 1.23, Proposed Revision 1, Regulatory Guide 1.111, Revision 1, and Regulatory Guide 1.109, Duke has reviewed the existing meteorological system at Catawba Nuclear Station and, based on that review, has developed a plan for upgrading the meteorology system.

The meteorological measurement program at Catawba Nuclear Station was originally designed to best describe the meteorological conditions on-site by taking into account source characteristics, terrain features and modeling needs. Duke has changed the meteorological system by upgrading the instrumentation and modifying the data transfer and access methodologies. The modifications include:

- 1) The meteorological microprocessor has been replaced with a digital data link connecting the instrumentation and the station.
- 2) The analog chart recorders have been replaced with digital chart recorders.
- 3) The data is scanned and averaged by the station process monitoring computer and transferred to databases accessible by the ERO.

### EFFLUENT DISPERSION MODEL

The Class A model has calculation capability that can produce initial transport and diffusion estimates for the plume exposure emergency planning zone within fifteen minutes following classification of an incident. The Class B model is a numerical model that represents actual spatial (space) and temporal (time) variations affecting plume distribution; it can provide estimates of deposition and relative concentration of radioactivity within the plume exposure and ingestion planning zones for the duration of the release. More detailed description can be found in INPO 86-008 Dose Assessment Manual.

The effluent dispersion model at Catawba uses a variable trajectory, puff advection dispersion model to simulate atmospheric transport and diffusion of radioisotopes from Catawba Nuclear Station. Plume trajectories are calculated using meteorological data obtained directly from the site meteorological tower. Puffs are transported by the horizontal wind field which varies with time. The diffusion (or spread) of each puff is based on a Gaussian distribution model. The dimensions of individual puffs, which compose the plume, are determined as a function of travel distance and atmospheric stability. Further, the initial dimensions of puffs are adjusted to account for building wake effects. Plume growth during changing atmospheric stability conditions is determined using a virtual source concept. Each puff is released at a rate which is based on current fifteen minute forecasted meteorology. The puff advection model is used for both the real-time and the forecast operating modes. In the real time mode, the model uses actual Operator Aid Computer (OAC) fifteen minute averaged data as it becomes available. For a forecast, the user is required to enter one time set of meteorological data representative of the entire period.

Radioisotopes released to atmosphere are assumed to be distributed in a Gaussian manner, subject to reflection in the vertical direction between the surface boundary and mixing layer lid (i.e., mixing height) above. The diffusion of release materials is expressed in terms of a normalized concentration  $\chi/Q$ . Normalized concentrations are multiplied by a source strength  $Q$  to provide an estimate of cloud concentration  $\chi(\text{Ci}/\text{m}^3)$ . Puff depletion that takes in consideration the removal of iodines and

particulate from the plume as a result of dry and wet deposition; which is also calculated. Deposition fluxes are provided to assist in the identification of areas where relative high levels of surface contamination might be expected to occur. Diffusion and deposition for each puff are determined after each advection step. Modeled release from Catawba Nuclear Station is assumed to be at or below the containment structure; therefore, all releases are modeled as being emitted from ground-level sources. The model uses modified  $\sigma_y$  and  $\sigma_z$  diffusion parameters to account for building downwash effects on ground level releases. The model dispersion routines include the concept of a mixing height which recognizes that the atmosphere is heated from below as the earth absorbs the sun's ultraviolet radiation. The height above ground for this boundary, between lower unstable and upper stable air is known as the mixing height. The value for mixing height used in the model is based on seasonal afternoon mean at the site. Atmospheric stability is determined from the vertical temperature gradient (delta-temperature) for stability classification. At the end of each advection step, total dry and wet deposition from all puffs are calculated and accumulated at each model receptor location.

## INSTRUMENTATION

Figure 2-1 shows the type and number of parameters measured at Catawba Nuclear Station. The meteorological conditions present at Catawba Nuclear Station warrant the use of the basic described meteorological variables. These include wind speed and wind direction measured at high and low levels, and delta-temperature. Ambient air temperature, dew point temperature and precipitation instrumentation are also provided but are not required as input for off-site dose assessment calculations.

## DATA HANDLING

Meteorological data used for dose calculations are 15 minute running averages of the variables. The 15 minute running averages are determined by the Operator Aid Computer (OAC) which scans the variables each minute. The data is stored on databases that are accessed by the personnel performing the dose calculations. As a backup, the variables are also recorded each five seconds on digital chart recorders located in the Control Room. These systems meet the accuracy and other specifications suggested in Regulatory Guide 1.23, Proposed Revision 1.

## DOSE ASSESSMENT METHODOLOGY

The first radiological indication of a problem in a reactor building is through increased control room monitor readings from containment particulate and noble gas (EMF) skid package. It is assumed that the first monitor to indicate increase of containment activity is the noble gas monitor because it is a non-integrating, near instantaneous response to increased noble gas radioactivity in containment. Leak rate from containment to the annulus or bypass to the environment may be based on containment design basis leakage, or leakage may be a function of containment pressure and hole size. Unit vent release may be from several ventilation source intakes including annulus and Auxiliary Building ventilation systems. It is possible both Unit 1 and 2 vents could contribute to an off-site release because of shared ventilation. Each unit vent is monitored with particulate and noble gas (EMF) skid package with indication and detection as previously stated. There are four main steam lines per unit (A,B,C,D) with coded Safety Relief valves; Power Operated Relief Valve (PORV), atmospheric steam dump valves and each unit has an auxiliary feedwater pump turbine valve release path. Steamlines have monitors (EMFs) installed, including  $N^{16}$  detectors that may provide first indication of primary to secondary leakage. Steam generator tube leakage is monitored through the affected unit Condensate Steam Air Ejector Monitor. Steam Release (MSR) accumulator program on the Operator Aid Computer scans these valves and calculate pounds mass (lbm) released based on valves being read closed or not closed.

The model can be used to calculate Source Term release through up to five release pathways and has capability of maintaining an inventory of up to twenty-four radioisotopes for each selected accident type(s). The model assumes a release to include noble gases, iodines, and particulates unless release path grab sample is obtained and analyzed, and model direct entry of nuclides is selected for Source Term calculation. Dose calculation methods attempt to predict dose concentration at specific receptor locations downwind from the release point. The model provides dose calculations from plume exposure, inhalation and material deposited on the ground consistent with methods of the EPA-400-R-92-001 document, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*. Using dose rate conversion factors, the model calculates a combined dose from external exposure from the plume with plume inhalation and four day external exposure from material deposited on the ground (the sum of which is referred to as the Total Effective Dose Equivalent [TEDE]), as well as the Committed Dose Equivalent to the Thyroid from inhalation of radioiodines (referred to as CDE). For the forecast period (expected release duration using a default of four hours), the TEDE and its separate components, and CDE Thyroid dose is calculated and then used to determine Protective Action Recommendations (PAR) consistent with Protective Action Guides (PAGs) given in EPA 400.

## DETAILED DESCRIPTION OF SUBSYSTEMS

### Sensors to Operator Aid Computer

Lightning protection is provided for all sensors and signal conditioning equipment; wind sensors are outfitted with heating jackets, when necessary, for protection against icing conditions. Signal conditioners are housed in an environmentally controlled building at the base of the microwave tower. Signals to the plant are converted from analog to digital and transmitted via a data link. For each variable, one channel transmits data to the OAC and another transmits to the chart recorders.

### Operator Aid Computer (OAC) to Plant Databases

The Operator Aid Computer systems use process monitoring equipment. Meteorological data is received at the station, converted from digital to analog, and scanned each minute by the Unit 2 OAC. Each minute, the fifteen minute running average of each parameter is calculated and passed to the Unit 1 OAC. Each OAC transmits data to two databases, one hosted on the site VAX system and the other hosted on a site PC server. ERO personnel can access the data on either database using PCs located in each emergency facility. Alternatively, the current data may be accessed directly on either OAC using terminals located in the Technical Support Center.

### Digital Chart Recorders

Meteorological data is also received at the station, converted from digital to analog, and scanned every five seconds by digital chart recorders. These are located in the Control Room. The recorders accumulate the average of the samples for each hour and print this information on the charts.

## QUALITY ASSURANCE

Meteorological components have been designed, procured and installed as a non-safety related system. New equipment has been purchased from suppliers who have provided high quality, reliable products in the past. Surveillance during construction was provided as for any other non-safety system.

Maintenance, calibration and repair procedures are available at the site for inspection. Inventories of meteorological system spare parts, sensors and components are maintained in company files.



FIGURE 2-1

CATAWBA NUCLEAR STATION  
METEOROLOGICAL PARAMETERS OF THE UPGRADED SYSTEM

Measurement System	60 m (upper level)	Upper wind speed and direction Upper RTD
	10 m (lower level)	Lower wind speed and direction Lower RTD

NOTE 1:  $\Delta T$  is obtained by subtracting the lower RTD from the upper RTD.

NOTE 2: Ambient dry bulb temperature, dew point and precipitation parameters are provided but not required as input for off-site dose assessment calculations.

## APPENDIX 3

### DUKE ENERGY CATAWBA NUCLEAR STATION ALERT AND NOTIFICATION SYSTEM DESCRIPTION

#### GENERAL DESCRIPTION

The Alert and Notification System for Catawba Nuclear Station consists of an acoustic alerting signal and notification of the public by commercial broadcast (EAS - Emergency Alert System). The system is designed to meet the acceptance criteria of Section B of Appendix 3, NUREG-0654, FEMA-REP-1, Rev. 1.

An engineering study of the Catawba Nuclear Station Alerting System was prepared by Duke-Energy and was submitted February, 1983. This is an annotated version of the study.

The Emergency plans of Duke Energy, the States of North Carolina and South Carolina, and the counties of Mecklenburg, Gaston, and York include the organizations and individuals, by title, who will be responsible for decision-making as regards the alert and notification system. The county locations from which the sirens would be activated and, potentially, the request for an EAS message would come are manned 24 hours per day. Each organization's plan describes provisions for use of public communications media or other emergency instructions to members of the public. The plans of both states include a description of the information that would be communicated to the public under given circumstances.

#### A. Concept of Operations

A system of 89 fixed sirens is installed and operational in the 10 mile EPZ area around Catawba Nuclear Station. A backup means of alerting and notification is described in the State and County Plans. This backup method includes reverse 911 and area-wide emergency service vehicles traversing the area giving both an alerting signal and notification message.

Each county will control the activation of the sirens within its boundaries.

#### B. Criteria for Acceptance

The alert and notification system for the Catawba Nuclear Station provides an alerting signal and an informational or instructional message to the population (via the EAS) on an area-wide basis throughout the 10 mile EPZ within 15 minutes from the time the cognizant off-site agencies have determined the need for such alerting exists. The emergency plans of each state include evidence of EAS preparation for emergency situations and the means for activating the system.

#### C. Physical Implementation

1. The activation of this alert and notification system requires procedures and relationships between both Duke Energy and the off-site agencies that support Duke and Catawba Nuclear Station.

When an incident is determined to have reached the level requiring public protective actions, Duke contacts the cognizant off-site agency via the Duke Emergency Management Network (DEMNET) and provides its recommendations. This system is available for use 24 hours per day and links the Control Room, TSC, EOF, SERT headquarters, the county warning points/EOCs, and the state Warning Point/EOCs.

2. The alert and notification system has multipurpose use built into it. The sirens are capable of producing a three minute steady signal for the nuclear plant emergency, natural disasters or nuclear attack. Procedures exist at the counties to allow activation of the sirens.

The expected performance of the sirens used in this system is described in Figure 3-1. These sirens complement existing alerting systems. The ambient background sound level in the Catawba area is taken to be 50 db for areas of "less than 2000 persons/per square mile" and 60 db for areas above this density. On this basis, the siren coverages are designed to provide a signal 10db above the average daytime ambient background.

Furthermore, the sirens have been located to assure that the maximum sound levels received by any member of the public should be lower than 126 db.

The basis for our selection of the 60 db(c) and 70 db(c) criteria is documented as follows:

Location of heavy industry - There is limited "heavy industry" in the Catawba 10 mile EPZ as described in Chapter 2 of the Catawba Nuclear Station UFSAR.

Attenuation factors with distance - 10 db loss per distance doubled (See Figure 3-1)

Siren output db(c) at 100 ft. vs. assumed range and acoustic frequency spectra -  
2001AC:  $127 \pm 1.0$ db at 100 feet

Assumed ranges per Figure 3-1, 10 db loss column

Frequency Spectra:

2001AC: top frequency 705Hz

Map showing siren location - See Figure 3-2

Mounting height of sirens - 50 feet (approximate)

Special weather condition considerations (such as expected heavy snow) - None

The siren will produce a 3-minute steady signal and is capable of repetition.

Test or Maintenance	Required frequency	Duke frequency
Silent Test performed by County	Every two weeks	Weekly
Silent Test performed by Telcomm	Every two weeks	Weekly and following Corrective and Preventative Maintenance
Growl Test	Quarterly and when Preventive Maintenance is performed.  A Growl Test is performed following Preventive Maintenance	Full Cycle Test is performed in lieu of the Quarterly Growl Test.
Full Cycle Test	Annually	Full Cycle/Quarterly
Preventive Maintenance	At least Annually	Annually

Note: Full Cycle Test may substitute for a growl test.

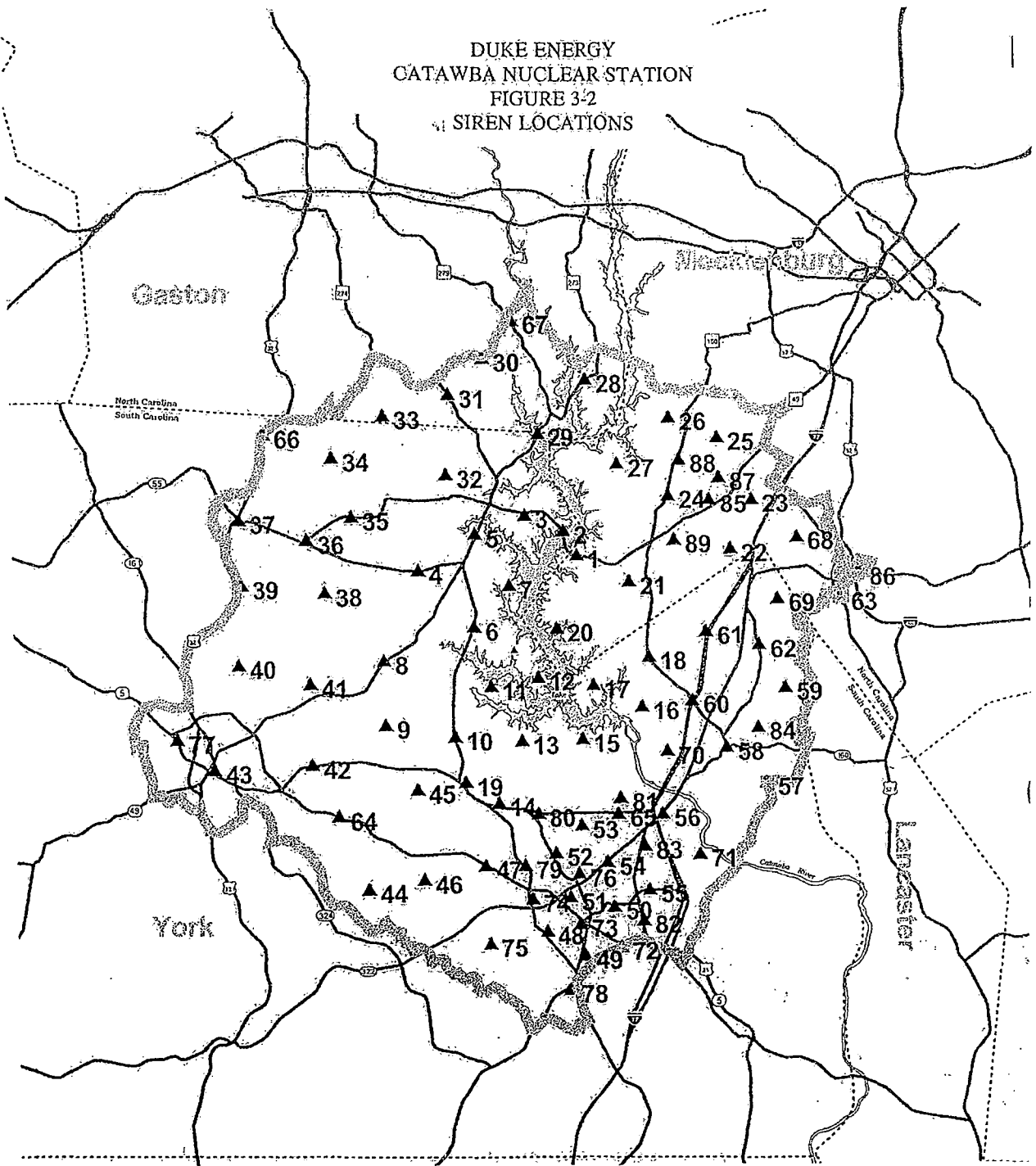
FIGURE 3-1

SIREN RANGE IN FEET

FIGURED AT 12 and 10 dB LOSS PER DISTANCE DOUBLED

Minimum Level Coverage in dB	2001 AC 126dB(C) Siren	
	12	10
85	1125	1830
80	1500	2600
75	2000	3680
73	2260	4210
70	2700	5200
68	3000	6000
65	3600	7400
60	4800	10400

DUKE ENERGY  
CATAWBA NUCLEAR STATION  
FIGURE 3-2  
SIREN LOCATIONS



EMERGENCY PLANNING ZONE (EPZ)  
FOR THE CATAWBA NUCLEAR STATION

## APPENDIX 4

### DUKE ENERGY CATAWBA NUCLEAR STATION EVACUATION TIME ESTIMATES

The Evacuation Time Estimates (ETEs) for the Catawba Nuclear Station described in part J of this plan, dated December 2012, KLD Engineering, P.C. Report KLD TR-510, Catawba Nuclear Station, Development of Evacuation Time Estimates, Revision 1, was submitted under separate cover and is considered to be incorporated as part of this document by reference.

See the following:

- CNS-ETE-12132012, Rev. 000 (Part 1 of 2): PART 1 OF 2 - EVACUATION TIME ESTIMATES (ETE) REPORTS DATED 12/13/2012, REVISION 000 FOR CATAWBA NUCLEAR STATION.
- CNS-ETE-12132012, Rev. 000 (Part 2 of 2): PART 2 OF 2 - EVACUATION TIME ESTIMATES (ETE) REPORTS DATED 12/13/2012, REVISION 000 FOR CATAWBA NUCLEAR STATION.

The studies have been submitted for regulatory review and have been made available to site, state, and local planners for their use.

The evacuation study is available in the CNS Emergency Planning office for study and review.

## APPENDIX 5

### AGREEMENT LETTERS

This Appendix contains a list of written agreements between Duke Energy and other organizations that may be required to provide support to the Catawba Nuclear Station in the event of an onsite radiological emergency. The actual agreements are maintained on file by CNS Emergency Preparedness.

1. Piedmont Medical Center - Describes the arrangements between Piedmont Medical Center and Duke Energy Corporation relative to the medical care and treatment and to also have injured personnel that may also have radioactive contamination.
2. Carolinas Medical Center - Describes the arrangements between Carolinas Medical Center and Duke Energy Corporation relative to the medical care and treatment and to also have injured personnel that may also have radioactive contamination.
3. Bethel Volunteer Fire Department Describes the type of assistance which the Bethel Volunteer Fire Department will provide to the Catawba Nuclear Station in the event of an emergency such as a radioactive release, hostile action, large scale fire, natural disaster (i.e. hurricane, tornado, earthquake, or flooding), or hazardous material issue.
4. Memorandum of Understanding between Duke Energy Carolinas, LLC and York County, South Carolina - Describes both emergency and non-emergency assistance by York County to support the Catawba Nuclear Station Emergency Plan.
5. Memorandum of Understanding between Duke Energy Carolinas, LLC and Mecklenburg County, North Carolina - Describes both emergency and non-emergency assistance by Mecklenburg County to support the Catawba Nuclear Station Emergency Plan.
6. Memorandum of Understanding between Duke Energy Carolinas, LLC and Gaston County, North Carolina - Describes both emergency and non-emergency assistance by Gaston County to support the Catawba Nuclear Station Emergency Plan.
7. Memorandum of Understanding among the State of North Carolina Department of Public Safety, North Carolina Emergency Management (NCEM), and Duke Energy Carolinas, LLC - Describes both emergency and non-emergency assistance by the State of North Carolina Department of Public Safety, North Carolina Emergency Management (NCEM), and the State of North Carolina Division of Health Service Regulation, Radiation Protection Section (RPS) to support the Catawba Nuclear Station Emergency Plan.
8. Memorandum of Understanding among the South Carolina Emergency Management Division, the South Carolina Department of Health and Environmental Control, and Duke Energy Carolinas, LLC - Describes both emergency and non-emergency assistance by the South Carolina Emergency Management Division, the Carolina Department of Health and Environmental Control to support the Catawba Nuclear Station Emergency Plan.
9. Center for Emergency Medicine - Describes the arrangements Center of Emergency Medicine and Duke Energy Corporation relative to the medical care and treatment and to also have injured personnel that may also have radioactive contamination.
10. Deleted



11. REACTS - Describes the arrangement for the US Department of Energy (DOE) REAC/TS facilities and team to be available to provide back-up capability and assistance to Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. in the event of a radiological emergency.
12. DOE - Savannah River - DOE - Savannah River--Describes the arrangements between the US Department of Energy, National Nuclear Safety Administration to support the Emergency Plans of the Duke Energy Carolinas and Duke Energy Progress nuclear sites DOE/NNSA assistance will be advice, detection and identification of radioactive materials, and/or monitoring and assessment actions essential for the control of the immediate hazards to health and safety.
13. INPO - Certifies that INPO will assist the Catawba Nuclear Station in acquiring of other organizations in the nuclear industry as described in Section 1 of the Emergency Resources Manual, INPO 03-001 and the United States Industry Response Framework.
14. Deleted
15. Joint Information Center - Establishes an agreement regarding, and provides reference to , the operating guidelines, processes, and procedures governing the use of Joint Information System (JIS) and Joint Information Centers (JIC) by providing a holistic approach for a communications response to a declared emergency or significant event at the Catawba Nuclear Station.
16. Memorandum of Understanding between CNS EP, Work Control, Operations, Site Services and Information Technology on Use of OSC/OCC Area - Establishes that the OSC/OCC/WCC is a multi-purpose facility with the OSC in a state of readiness at all times for compliance with the station's Emergency Plan.
17. Alternate Site Agreement - Describes the terms and conditions of the agreement between the Catawba Nuclear Station and the McGuire Nuclear Station for using either facilities existing business unit space; in this case the Technical Support Center or Alternate Technical Support Center as an alternate site Emergency Operations Facility in the event of a service disruption and/or a disaster rendering the primary Emergency Operations Facility unavailable and relocation of the primary Emergency Operations Facility is necessary.
18. Carolinas Delivery Operations Departmental Interface Agreement - Describes the use of the Emergency Operations Facility by Carolinas Delivery Operations for emergency situations.
19. Memorandum of Understanding between Nuclear Generation Department and the Distribution Maintenance and Construction-West Department Concerning Use of the York Operations Center as Catawba Nuclear Station's Evacuation/ Assembly/Staging Site - Provides an off-site location where personnel released from Catawba Nuclear Station can assemble, be monitored for radiation and, if necessary decontaminated.
20. Memorandum of Understanding between Safe Industries and Catawba, McGuire and Oconee Nuclear Sites - Describes the agreement to the request by Duke Energy regarding assistance with technical support after hours and in emergency situation. In the event a Duke Energy site is in need of emergency technical support , trouble shooting, or assistance with the equipment or operation of Hale pumps

- 21 Operating Agreement between Duke Energy's Lincoln Combustion Turbine Facility and McGuire, Catawba and Oconee Nuclear Stations Nuclear Supply Chain - Documents the contingency plan between Duke Energy's Lincoln Combustion Turbine Facility and Duke Energy's McGuire, Catawba, and Oconee Nuclear Stations concerning the Lincoln Combustion Turbine Facility providing the emergency supply of diesel fuel during a disruption of normal diesel fuel supply.
22. York County Sherriff's Office to Support the Emergency Plan of the Catawba Nuclear Station - Provides for assistance to support the Catawba Nuclear Station's Emergency Plan, including assistance expected to be provided in the event of an emergency.

These agreements are verified current through annual recertification of the Catawba Emergency Plan. A copy of the annual recertification (including the agreements) is maintained on file by CNS Emergency Preparedness. The actual agreements are re-confirmed every 3 years and maintained on file by CNS Emergency Preparedness.