TREAT AS

SENSITIVE

INFORMATION

Progress Energy

10 CFR 50.4(b)(5)
10 CFR 50.54(q)
10 CFR 50, Appendix E
10 CFR 72.44(f)

Serial: RNP-RA/04-0119

SEP 2 9 2004

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

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

H. B. ROBINSON INDEPENDENT SPENT FUEL STORAGE INSTALLATION
DOCKET NO. 72-3/LICENSE NO. SNM-2502

TRANSMITTAL OF EMERGENCY PLAN REVISION

Ladies and Gentlemen:

In accordance with 10 CFR 50.4(b)(5), 10 CFR 50.54(q), Appendix E to 10 CFR 50, and 10 CFR 72.44(f), Progress Energy Carolinas, Inc., also known as Carolina Power and Light Company, is transmitting a revision to the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, Emergency Plan. The attachment to this letter contains the revision number, effective date, and a summary of changes associated with this Emergency Plan revision. The enclosed copy of the revised Emergency Plan contains a "Summary of Changes" page that provides a more detailed discussion of the specific changes that have been made. Please replace the superseded copy with the enclosed revision.

If you have any questions concerning this matter, please contact me at (843) 857-1253.

Sincerely,

C. T. Baucom
Supervisor-Licensing/Regulatory Programs

AX45

Progress Energy Carolinas, Inc.
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

CTB/cac

Attachment

Enclosure

c: Dr. W. D. Travers, NRC, Region II
NRC Resident Inspector, HBRSEP
J. R. Strosnider, Jr., NRC, NMSS
C. P. Patel, NRC, NRR (w/o Enclosure)

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

REVISION NUMBER, EFFECTIVE DATE, AND SUMMARY OF CHANGES

Procedure	Revision No.	Effective Date
PLP-007, "Robinson Emergency Plan"	55	09/08/04

Summary of Changes

The changes contained in Revision 55 of PLP-007, "Robinson Emergency Plan," have been reviewed in accordance with 10 CFR 50.54(q) and it has been concluded that the changes do not decrease the effectiveness of the plan.

The changes include:

- The increase in authorized reactor power level from 2300 megawatts to 2339 megawatts resulting from the Appendix K power uprate.
- Updates to the titles of certain offsite organizations that have previously established Letters of Agreement, and the addition of a Letter of Agreement for the Darlington County Combustion Turbine Plant.
- Reference to a sample point for Cunningham Dairy Farm has been deleted, since that facility no longer exists.
- Evacuation route information has been updated based on the latest information for the affected counties.

The remaining changes are administrative in nature and do not impact the ability of the Emergency Response Organization (ERO) to respond to an emergency.

These changes to the H. B. Robinson Steam Electric Plant, Unit No. 2, Emergency Plan do not reduce the capability of the ERO to respond to an emergency. Additionally, the ability to activate the ERO facilities, determine protective measures, and disseminate necessary information for protection of the health and safety of the public are not adversely affected by these changes. Therefore, these changes do not decrease the effectiveness of the plan.

Progress Energy	R Reference Use

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

PLANT OPERATING MANUAL

VOLUME 1

PART 2

PLP-007

ROBINSON EMERGENCY PLAN

REVISION 55

SUMMARY OF CHANGES
PRR 107674, PRR 122377

STEP #	REVISION COMMENTS
Step 2.9	Corrected title for South Carolina Operational Radiological Emergency Response Plan.
Step 5.1.1.1	Deleted "the" prior to Progress Energy in paragraph 1.
Step 5.1.3.1.c	Added the Remote Emergency Response Facility to the listing of emergency response facilities. Deleted reference to the Forward EOC.
Figure 5.1.1-1 Robinson Site Pan	Added updated version of site map. (NCR 122728)
Step 5.1.1.1	Changed the power level 2339 MW to reflect power uprate per EC 47160. (NCR 122728)
Step 5.3	Changed number sequence to bullets to avoid duplicate numbering.
Step 5.3.1.2	Corrected procedure title for EPNOT-01.
Step 5.3.2	Revised statement to indicate pagers as a means for notifying ERO personnel and to correct the nomenclature for the Dialogic system.
Step 5.3.2.1 paragraph 4	Added Crystal River Unit 3
Step 5.3.2.3	Added Operations personnel to personnel who would report to the OSC.
Step 5.3.2.3	Revised step to reflect the current staffing in the OSC to include Operations personnel.
Step 5.3.3.1.e	Changed Health Physics to Radiation Control
Step 5.3.4.3.c	Replaced Bishopville Police Department with Lee County Enhanced 911 Facility.
Step 5.3.5	Corrected the nomenclature for the Dialogic system.
Table 5.3.5-1	Deleted the reference to the footnote for discretionary activation and deleted footnote.
Step 5.4.1.1	Corrected title for EPNOT-01
Table 5.4.4-3	Corrected evacuation route information for Zones A-1, A-2, E-1, and E-2 in Chesterfield County and Zone B-2 in Darlington County.
Step 5.5, bullet 2	Changed Carolina Power & Light to Progress Energy
Step 5.5.3	Changed Health Physics to Radiation Control and added "Operations personnel to OSC personnel complement.
Table 5.5.7-5	Deleted reference to sample point for Cunningham Dairy Farm
Attachment 6.1	Corrected information to reflect current status of communications equipment at Robinson: • Spelled out PBX • Changed VHF to UHF radio transceivers • Changed Caronet to Voicenet • Described the change for NRC Emergency Telecommunications System. (NCR #96545)
Attachment 6.2	Changed Carolina Power and Light Company to Progress Energy Carolinas, Inc. Replaced Bishopville Police Department with Lee County Sheriff's Department and corrected step reference Corrected reference for Lee County Enhanced 911 Facility Added Darlington County Combustion Turbine Plant and step reference.
Attachment 6.4	Deleted recipient identification numbers and locations from distribution list due to elimination of hard copy libraries in lieu of electronic distribution. (NCR 122728)

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1.0 PURPOSE

1.1 The purpose of this procedure is to provide the methodology to ensure protection of plant personnel and the general public and to prevent or mitigate property damage that could result from an emergency at the H. B. Robinson Steam Electric Plant, (HBRSEP) Unit No. 2.

2.0 REFERENCES

2.1 Progress Energy, HBRSEP Operating Manual (date varies by volume and by entry)

2.2 Radiation Control and Protection Manual (NGGM-PM-0002)

2.3 Updated Final Safety Analysis Report (UFSAR), Progress Energy, HBRSEP

2.4 EPA-400/R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," U. S. Environmental Protection Agency, May, 1992

2.5 RTM-96, "Response Technical Manual" USNRC, Volume 1, Revision 4, Washington, D. C., March 1996

2.6 RCM-96, "Response Coordination Manual" USNRC, September 1996

2.7 Evacuation Time Estimates - Robinson Steam Electric Plant, prepared for CP&L by HMM Associates, June, 1987

2.7.1 NPSS-92-216, Review of 1987 Robinson Evacuation Time Study

2.8 National Council on Radiation Protection (NCRP) Report No. 55, August 1, 1977, "Protection of the Thyroid Gland in the Event of Releases of Radioiodine"

2.9 South Carolina Operational Radiological Emergency Response Plan, Part 2 - H. B. Robinson FNF Site Specific

2.10 NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," January 1980

2.11 NUREG-0737, "Clarification of TMI Action Plan Requirements," dated October 1980

2.12 Oak Ridge National Laboratory Report of the Clinch Valley Study, ORNL-4835 (January 1973), J. A. Auxier and R. O. Chester, eds.

2.13 SAND 77-1725, Public Protection Strategies for Potential Nuclear Accidents, Sandia Laboratory

2.14 Title 10, Code of Federal Regulations
- 2.14.1 Part 20, Standards for Protection Against Radiation
- 2.14.2 Part 50, Licensing of Production and Utilization Facilities
- 2.14.3 Part 50, Appendix E, Emergency Planning and Preparedness for Production and Utilization Facilities
- 2.14.4 Part 100, Reactor Site Criteria

2.15 Engineering Evaluation 94-079, Administrative Building Public Address

2.16 Improved Technical Specifications (ITS)

2.17 ESR 96-00441, Service Water Pump Vortexing Determination

2.18 Emergency Preparedness Position (EPPOS) on Acceptable Deviations to Appendix 1 to NUREG-0654/FEMA-REP-1, EPPOS No. 1

2.19 RNP-RA/95-0096 - Response to Request for Additional Information Regarding Request for Exception to Location of the Technical Support Center in the Protected Area Submitted February 24, 1995. (CR-43869)

2.20 NRC Memo "Information Assessment Team Recommended Actions In Response to Site Specific Credible Threat at Nuclear Power Plant (1A-01-1)", dated 11/06/01

2.21 ESR 96-00446, Revision 4/EC 47646, Met Tower Mod

2.22 RNP RA/01-0164, Request for Technical Specification Change to Eliminate the Requirements for the Post-Accident Sampling System

2.23 NRC Amendment No. 192, Elimination of Requirements for the Post-Accident Sampling System

2.24 EC 49849, Set-Point, Declaration Evaluation for EP

2.25 EC 47069, Main Steam N-16 Monitors

2.26 EC 47088, Obsolete Strong Motion Recorders - Kinemetrics

3.0 RESPONSIBILITIES

3.1 Individual responsibilities are as noted within the body of this procedure. These responsibilities may be different within different portions of the Emergency Plan.

4.0 DEFINITIONS/ABBREVIATIONS

4.1 Definitions

4.1.1 Accident - Any unforeseen, or unintentional occurrence or mishap resulting in, or potentially resulting in, physical injury or injury due to radiation exposure or excessive exposure to radioactive materials.

4.1.2 Activated -A position or facility has sufficient resources to perform required functions for the event in progress.

4.1.3 Annual - Once every 364 days +91 days (unless otherwise stated).

4.1.4 Augmented - A facility is said to be augmented when staffing meets the requirements of Table 5.3.2-1, Onshift and Additional Staffing for Emergencies.

4.1.5 Biennial - Once every 728 days +182 days (unless otherwise stated).

4.1.6 Corrective Actions - Those emergency measures taken to lessen 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 a release (e.g., equipment shutdown, fire fighting, repair, and damage control).

4.1.7 Emergency Action Levels - Plant or environmental conditions used to determine the existence of an emergency and to classify its severity. The conditions include specific instrument readings (e.g., radiation release rates out of a building vent) that may be used as thresholds for initiating emergency measures such as initiating a notification procedure.

4.1.8 Emergency Classification - The characterization of emergency situations consisting of several groupings including the entire spectrum of possible radiological emergencies. The four classes of emergencies, listed in order of increasing severity (and decreasing probability), are (1) Unusual Event, (2) Alert, (3) Site Area Emergency, and (4) General Emergency.

4.0 DEFINITIONS/ABBREVIATIONS (Continued)

4.1.9 Emergency Operating Procedures - Specific procedures that provide step-by-step instructions to guide plant operations during potential or actual emergency situations.

4.1.10 Emergency Operations Centers - Designated facilities designed and equipped for effective coordination and control of emergency operations carried out within an organization's jurisdiction.

4.1.11 Emergency Operations Facility - An onsite support facility for the management of overall licensee emergency response including coordination with federal, state, and local officials, coordination of offsite radiological and environmental assessment, and determination of recommended public protective actions.

4.1.12 Emergency Planning Zones (EPZ) - A generic area defined about a nuclear plant to facilitate emergency planning offsite. The plume exposure EPZ is described as an area with a 10-mile radius and the ingestion exposure EPZ is described as an area with a 50-mile radius in NRC NUREG-0654. (See Figure 5.1.1-7)

4.1.13 Exclusion Area – Progress Energy-owned property that surrounds the reactor plants as defined in 10 CFR 100. The area is of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated fission product release would not exceed 25 rem whole body dose or 300 rem thyroid dose.

4.1.14 Ingestion Exposure Pathway also known as Ingestion Exposure Emergency Planning Zone (IPZ) - The potential pathway of radioactive materials to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables.

4.1.15 Joint Information Center (JIC) - An offsite support facility for the coordinated release of public information by Progress Energy and various governmental agencies.

4.1.16 Monthly - Once every 31 days +7 days. May be scheduled every 28 or 31 days. If scheduled on 28 day interval the grace period is as follows: 31 x .25 = 7.75 + 3 or once every 28 days + 10.

4.1.17 Onsite Protective Measure - An action taken to avoid or reduce exposure to personnel onsite.

4.0 **DEFINITIONS/ABBREVIATIONS** (Continued)

4.1.18 Nuclear Incident - An event or series of events, either deliberate or accidental, leading to the release or potential release into the environment of radioactive material in sufficient quantity warranting consideration of protection actions.

4.1.19 Operational Support Center -An onsite facility for coordinated dispatch of emergency repair missions.

4.1.20 Plume Exposure Pathway - The potential pathway of radioactive materials to the public through 50 year committed internal dose and external exposure from the plume and deposited materials.

4.1.21 Population-at-Risk - Those persons for whom protective actions are being or would be taken.

4.1.22 Projected Dose - An estimate of the potential radiation dose which affected population groups could receive.

4.1.23 Protected Area - The double-fenced security area, posted with "No Trespassing" signs, with intrusion detection devices immediately surrounding the plant structures.

4.1.24 Protective Action - An activity conducted in response to an incident or potential incident to avoid or reduce radiation dose to the members of the public.

4.1.25 Protective Action Guide - The projected dose to reference man, or other defined individual from an accidental release of radioactive material at which a specific protective action to reduce or avoid that dose is warranted.

4.1.26 Quarterly - Once every 92 days +23 days.

4.1.27 Radiological Emergency - An off-normal situation that has or may have a radiological impact on the public health and safety.

4.1.28 Recovery Actions - Those actions taken after an emergency to restore the HBRSEP and the surrounding environment as nearly as possible to its pre-emergency condition.

4.0 DEFINITIONS/ABBREVIATIONS (Continued)

4.1.29 Restricted Area - Any area, access to which is limited by a physical barrier such as a wall, fence, or continuous surveillance and control of access by a representative of the company for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

4.1.30 Semi-Annual - Once every 184 days +46 days.

4.1.31 Site Boundary - An area whose boundary encompasses a 1400 ft. radius from the center of the reactor. This distance is specific for the HBRSEP.

4.1.32 State - The State of South Carolina.

4.1.33 Technical Support Center - A center outside of the control room that supplies information on the status of the plant to those individuals who are knowledgeable or responsible for engineering and management support of reactor operations in the event of an emergency, and to those persons who are responsible for management of the emergency response.

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

4.1.35 Unrestricted Area - An area, at or beyond the site boundary, access to which is neither limited nor controlled by the company.

4.2 Abbreviations

4.2.1 CCD - Corporate Communications Department

4.2.2 EAL - Emergency Action Levels

4.2.3 EOC - Emergency Operations Centers

4.2.4 EOF - Emergency Operations Facility

4.2.5 EOP - Emergency Operating Procedures

4.2.6 EPZ - Emergency Planning Zones

4.2.7 FPB - Fission Product Barrier

4.2.8 GPD - gallons per day

4.2.9 ISFSI - Independent Spent Fuel Storage Installation

4.2.10 JIC - Joint Information Center

4.2.11 OSC - Operational Support Center

4.2.12 PAG - Protective Action Guide

4.2.13 PC - Personal Computer

4.2.14 HBRSEP - H. B. Robinson Steam Electric Plant, Unit No. 2

4.2.15 TSC - Technical Support Center

4.2.16 SEOC - State Emergency Operations Center

5.0 PLAN

5.1 Introduction

The Emergency Preparedness Program for the HBRSEP consists of the Robinson Emergency Plan and its implementing Emergency Procedures. Also included are related radiological emergency plans and procedures of state and local organizations. The combined emergency preparedness programs have the following objectives:

1. Effective coordination of emergency activities among all organizations having a response role.
2. Early warning and clear instructions to the population-at-risk in the event of a serious radiological emergency.
3. Continued assessment of actual or potential consequences both onsite and offsite.
4. Effective and timely implementation of emergency measures.
5. Continued maintenance of an adequate state of emergency preparedness.

The Emergency Preparedness Staff performs the function of Emergency Preparedness Coordinator. The Robinson Emergency Plan and Procedures are contained in the HBRSEP Plant Operating Manual (POM), Volumes 1 and 2, which consists of the following parts:

Robinson Emergency Plan, Volume 1, Part 2

Emergency Procedures (EP), Volume 2, Part 5

A list of procedures required to implement the plan can be found in ATTACHMENT 6.7.

5.1.1 General Information

1. Plant Site Description

The HBRSEP is located due west of the dam of Lake Robinson in Western Darlington County at Longitude W. 80°, 9 min., 5 sec., Latitude N. 34°, 24 min, 2 sec. It is owned and operated by Progress Energy with Corporate Headquarters at Raleigh, North Carolina. The facility has one (1) nuclear reactor of Westinghouse Corporation manufacture. It has been in operation since March 1971 and is licensed to operate at
2339 megawatts-thermal with an associated gross electrical output of approximately 747 megawatts. Additionally, the facility has a fossil fuel (coal) fired generating unit which produces 174 megawatts of electricity, a combustion turbine producing approximately 13 megawatts, and a dry fuel storage facility (Independent Spent Fuel Storage Installation - ISFSI). The ISFSI facility operates under Material License SNM-2502.
Figure 5.1.1-1 shows a site plan for the HBRSEP.

5.1.1 (Continued)

2. Plume Exposure Emergency Planning Zone

The South Carolina Counties of Darlington, Chesterfield, Lee, and Kershaw have portions of the counties that lie within a ten-mile radius of the Robinson site. Only a very small portion of Kershaw County falls within this 10-mile radius, from generally the seven to ten-mile distance from the plant. A sparsely inhabited area of Kershaw County lies within the nine-to-ten-mile distances. The remainder of the area is the Lynches River Swamp and basically uninhabitable. The area also lies 90° out of the prevailing winds. Resultingly, the Plume Exposure Emergency Planning Zone (EPZ) is comprised of those portions of Darlington, Chesterfield, and Lee Counties lying within 10 miles of the HBRSEP (see Figure 5.1.1-2).

3. Principal exposure sources from the plume exposure pathways are:

- External exposure to gamma and beta radiation from the plume and from deposited material; and

- Committed dose to internal organs from inhalation of radioactive gases and/or radioactive particulates.

Major weather systems moving over the facility are primarily from the west with prevailing winds shown graphically in Figure 5.1.1-4 (wind rose).

4. Ingestion Exposure Emergency Planning Zone

The Ingestion Exposure EPZ is defined to be the area within a 50 mile radius of HBRSEP. The South Carolina Counties of Darlington, Chesterfield, Lee, Kershaw, Marlboro, Dillon, Marion, Florence, Williamsburg, Clarendon, Sumter, Richland, Fairfield, Lancaster and Chester, along with Anson, Robeson, Richmond, Union, and Scotland Counties in North Carolina, (or portions thereof) lie within a 50 mile radius of HBRSEP (See Figure 5.1.1-5).

5.1.1 (Continued)

The principal exposure sources from the ingestion pathway are contaminated water or food, such as milk or fresh vegetables. The time of potential exposure can range in length from hours to months.

5. Demographic Information

Demographic information for the 10-mile Emergency Planning Zones is presented in Figure 5.1.1-6. The 1987 Evacuation Time Study has been compared against 1990 census data and no additional changes are required (Ref. Memo NPSS 92-216).

5.1.2 Scope and Applicability

This document describes the Robinson Emergency Plan (Plan) which has been prepared in accordance with Section 50.47 and Appendix E, of Title 10, Part 50, of the Code of Federal Regulations. The Plan shall be implemented whenever an emergency situation is indicated as defined in Section 5.2,"Emergency Classifications." Radiological emergencies can vary in severity from the occurrence of an abnormal event, such as a minor fire with no radiological health consequences, to nuclear incidents having substantial onsite and/or offsite consequences.

In addition to emergencies involving a release of radioactive materials, events such as security threats or breaches, fires, electrical system disturbances, and natural phenomena that have the potential for involving radioactive materials are included in the Plan. Other types of emergencies that do not have a potential for involving radioactive materials are not included in the Plan.

The activities and responsibilities of outside agencies providing an emergency response role at the HBRSEP are summarized in the Plan and detailed in the State and County Emergency Plans.

5.1.3 Summary of Emergency Preparedness Program

The HBRSEP Emergency Preparedness Program consists of the Robinson Emergency Plan and its implementing procedures. The Plan provides the basis for performing advance planning and for defining specific requirements and commitments to be implemented by other documents and procedures. HBRSEP procedures provide the detailed actions and instructions that will be required to implement the Plan in the event of an emergency. The Plan and its implementing procedures are briefly described below.

1. Concept of Operations

The Robinson Emergency Plan describes the general nature of emergency response activities, the available emergency response resources and facilities, and the means for maintaining the emergency preparedness. Specific plant implementing procedures have been developed to describe in detail how involved plant and corporate personnel carry out their specific responsibilities as identified in the Plan. Each team and individual assignment carries with it specific emergency response duties, and each is provided with an on-shift person to perform those duties on an interim basis. This approach ensures under all conditions that every emergency response duty falls under some predesignated individual and provides a smooth transition as additional people are called to the plant, since each one knows ahead of time what his/her area of responsibilities will be.

a. Emergency Response Activities

The first step in responding to an emergency is recognizing and classifying the nature of the emergency. In order to standardize this process, the four emergency classifications described in NUREG-0654 are adopted for use in this Plan. Each class of emergency (Unusual Event, Alert, Site Area Emergency, and General Emergency) encompasses a predefined set of increasingly severe circumstances, including plant conditions, instrument readings, and effectiveness of in-plant corrective actions, known as Emergency Action Levels. The process of properly classifying an emergency is important because the subsequent response activities are dependent on the severity of the emergency.

5.1.3.1.a (Continued)

The next step is to notify (and activate as conditions warrant) the proper emergency organizations, both inside and outside Progress Energy. Proper integration of the efforts of the various response organizations is important to prevent omission or unnecessary duplication of key activities. Therefore, the Robinson Emergency Plan identifies in terms of information flow and communications links the interfaces between pertinent organizations, and identifies the role each is to perform.

The emergency response measures to be taken by Progress Energy are discussed in detail in this Plan, while those taken by the State and Counties are summarized herein with details provided in the South Carolina State Emergency Plans.

Beyond the process of notification and activation of support groups, a variety of efforts must be made to assess and minimize the consequences of an emergency condition. These efforts include estimates of the radiation exposures that may occur to plant and offsite personnel if the emergency is not brought quickly under control. Such estimates can be used to initiate preplanned protective actions. The decisions on protective actions offsite, such as taking shelter, limiting access to high-risk areas, or perhaps evacuation, are the responsibility of state and local authorities. The Plan provides for technical assessments of the course and consequences of the emergency and the means for providing state and local agencies with adequate information upon which to make their decisions. Emergency response activities also include personnel accountability, search and rescue, first aid, personnel decontamination, fire fighting, and damage control.

The final step is to declare the emergency over and perform any necessary post-accident recovery operations. The Plan describes the post-accident recovery provisions and identifies the transition from the emergency phase to the recovery phase.

5.1.3.1 (Continued)

b. Emergency Response Resources

The first line of defense in responding to an emergency lies with the normal operating shift on duty when the emergency begins. Therefore, members of the HBRSEP staff are assigned defined emergency response roles that are to be assumed whenever an emergency is declared. The overall management of the emergency is normally performed by the Plant Management. Onsite personnel have pre-assigned roles to support the Site Emergency Coordinator/Emergency Response Manager and to implement their directives. These roles, for the purpose of emergency planning, are cast in terms of emergency teams and assignments, each having designated personnel assigned to it. The emergency response resources available to respond to an emergency consist of the personnel at Corporate Headquarters, at other Progress Energy facilities, and, in the longer term, at organizations involved in the nuclear industry.

The Site Emergency Coordinator will also have ready access to the TSC Support Personnel. These personnel are knowledgeable of, and responsible for, various areas of emergency response. They may assemble in the TSC shortly after an Alert, Site Area Emergency, or General Emergency is declared in order to assist the Site Emergency Coordinator and to carry out his/her directives. Health Physics, Maintenance, and Engineering are among the disciplines available to assist.

5.1.3.1.b (Continued)

Once the Emergency Operations Facility has been activated, the Emergency Response Manager will be responsible for radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with federal, state, and local agencies. Corporate response activities and Corporate resources, such as equipment and response centers, are available to relieve the HBRSEP personnel of any activities that could hamper their response efforts.

Requests for support at HBRSEP will be coordinated by the EOF. Other Progress Energy nuclear facilities also maintain a staff of well-trained and experienced engineers, and technicians. These personnel represent a pool of technical expertise which can be called upon to provide additional support to HBRSEP, if required.

The Joint Information Center is activated at an Alert. These personnel and equipment are available to support onsite emergency management by providing a single point of information for the media. The Corporate Communications Department will provide public information services until the Joint Information Center is activated to interface with the media and general public.

In addition, as outlined in ATTACHMENT 6.3, Progress Energy has arranged for support from outside Progress Energy in the areas of fire fighting, rescue and medical assistance, as well as that support delineated in the State and County emergency plans. Assistance may also be available from the Nuclear Regulatory Commission, Federal Emergency Management Agency, Department of Energy, Westinghouse, and Washington Group. Industry resources identified by INPO are also available as Progress Energy is a signatory to the mutual assistance agreement.

5.1.3.1 (Continued)

c. Emergency Response Facilities

Special provisions have been made to assure that ample space and proper equipment are available to effectively respond to the full range of possible emergencies.

The emergency response facilities available include the Robinson Plant Control Room, Operational Support Center, Technical Support Center, Emergency Operations Facility, the Remote Emergency Response Facility, Joint Information Center, Harris Energy and Environmental Center, and Corporate Communications Department. Each of these facilities, as well as the South Carolina Emergency Operations Center, the Darlington County Emergency Operations Center, the Lee County Emergency Operations Center, and the Chesterfield County Emergency Operations Center are described in Section 5.5, "Emergency Facilities and Equipment."

d. Emergency Plan Maintenance

The Plan provides for maintenance of emergency preparedness by establishing the framework and requirements for training, drills and exercises, and periodic updating. Each HBRSEP Emergency Response Organization member is trained, qualified, and requalified as described in Section 5.6 of this Plan. The effectiveness of such training is gauged by the use of drills and exercises. Drills are supervised instruction periods aimed at developing, maintaining, and testing skills in a specific operation such as communications or radiation monitoring. An exercise tests the overall capability of the plant, state, and county emergency organizations to properly respond to an emergency. The Plan sets forth the frequency and purpose of such drills and exercises.

5.1.3.1.d (Continued)

The Plan also delineates the requirements for reviewing, updating, and auditing the Plan and for performing maintenance on and taking inventories of emergency equipment and supplies. The Emergency Preparedness Staff is designated to be responsible for overseeing this process as outlined in Section 5.6.1.3, "Emergency Preparedness Staff."

5.1.4 Robinson Emergency Procedures

The Plan implementing procedures define the specific (i.e., step-by-step) actions to be followed in order to recognize, assess, and correct an emergency condition and to mitigate its consequences. Procedures to implement the Plan have been developed to provide the following information:

1. Specific instructions to the plant operating staff for the implementation of the Plan.
2. Specific authorities and responsibilities of plant operating personnel.
3. A source of pertinent information, forms, and data to ensure prompt actions are taken and that proper notifications and communications are carried out.
4. A record of the completed actions.
5. The mechanism by which emergency preparedness will be maintained at all times.

FIGURE 5.1.1-1
ROBINSON SITE PLAN

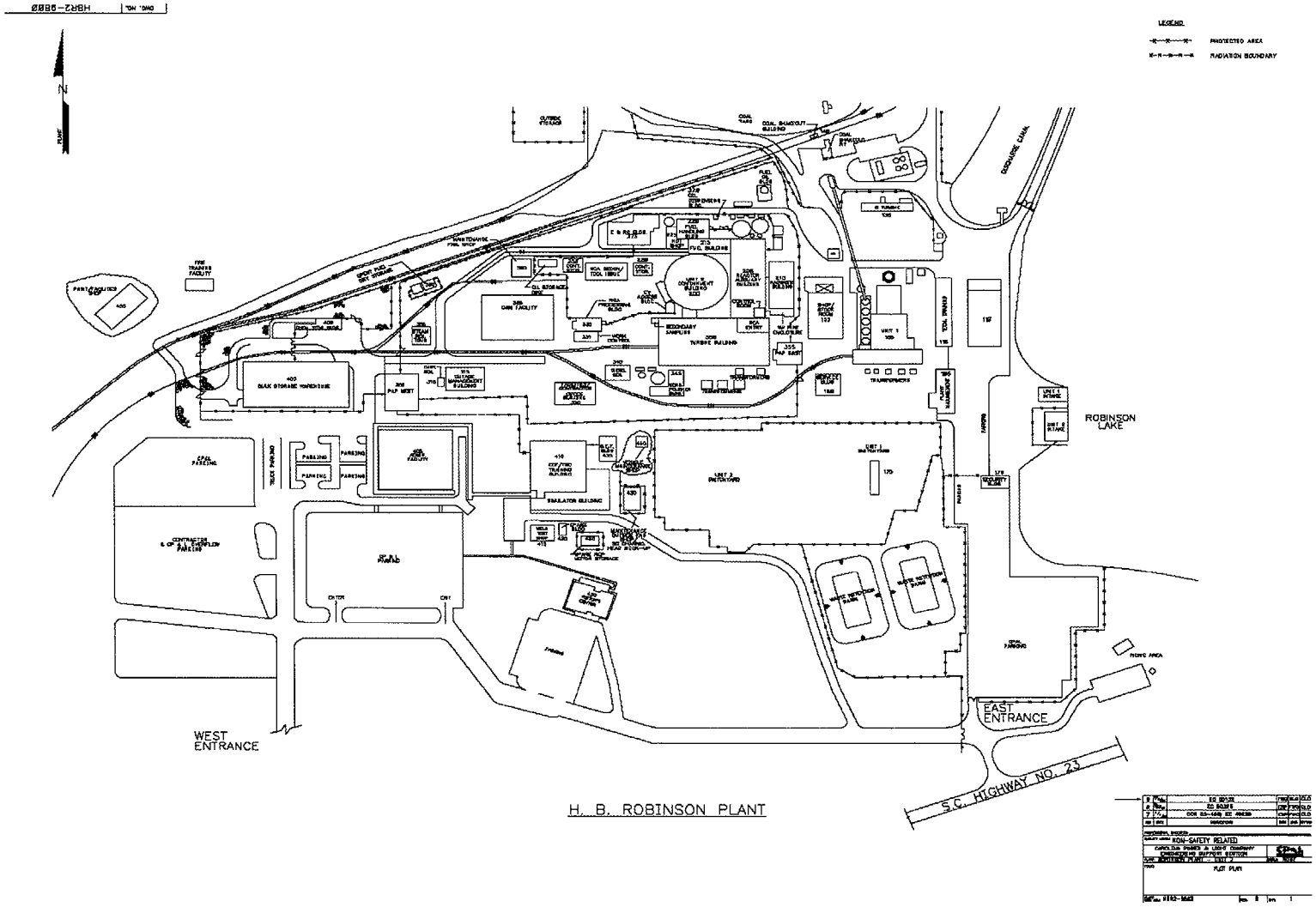
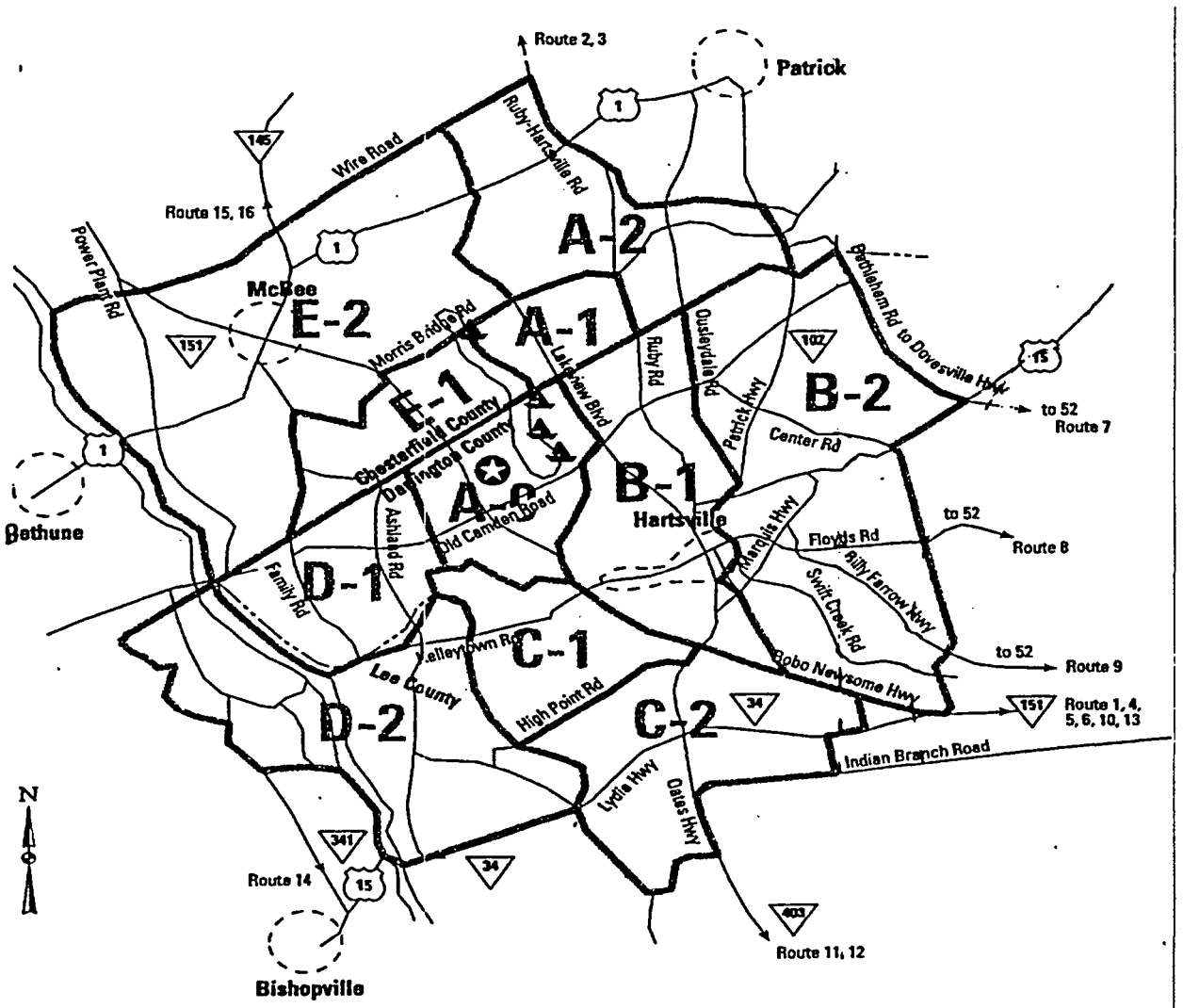


FIGURE 5.1.1-2
10 - MILE PLUME EXPOSURE EPZ



- Sector Boundaries
- County Boundaries
- State Evacuation Routes
- U.S. Highways
- S.C. Primary Highways
- Robinson Plant
- Boat Landings

FIGURE 5.1.1-3
EMERGENCY RESPONSE FACILITY LOCATIONS

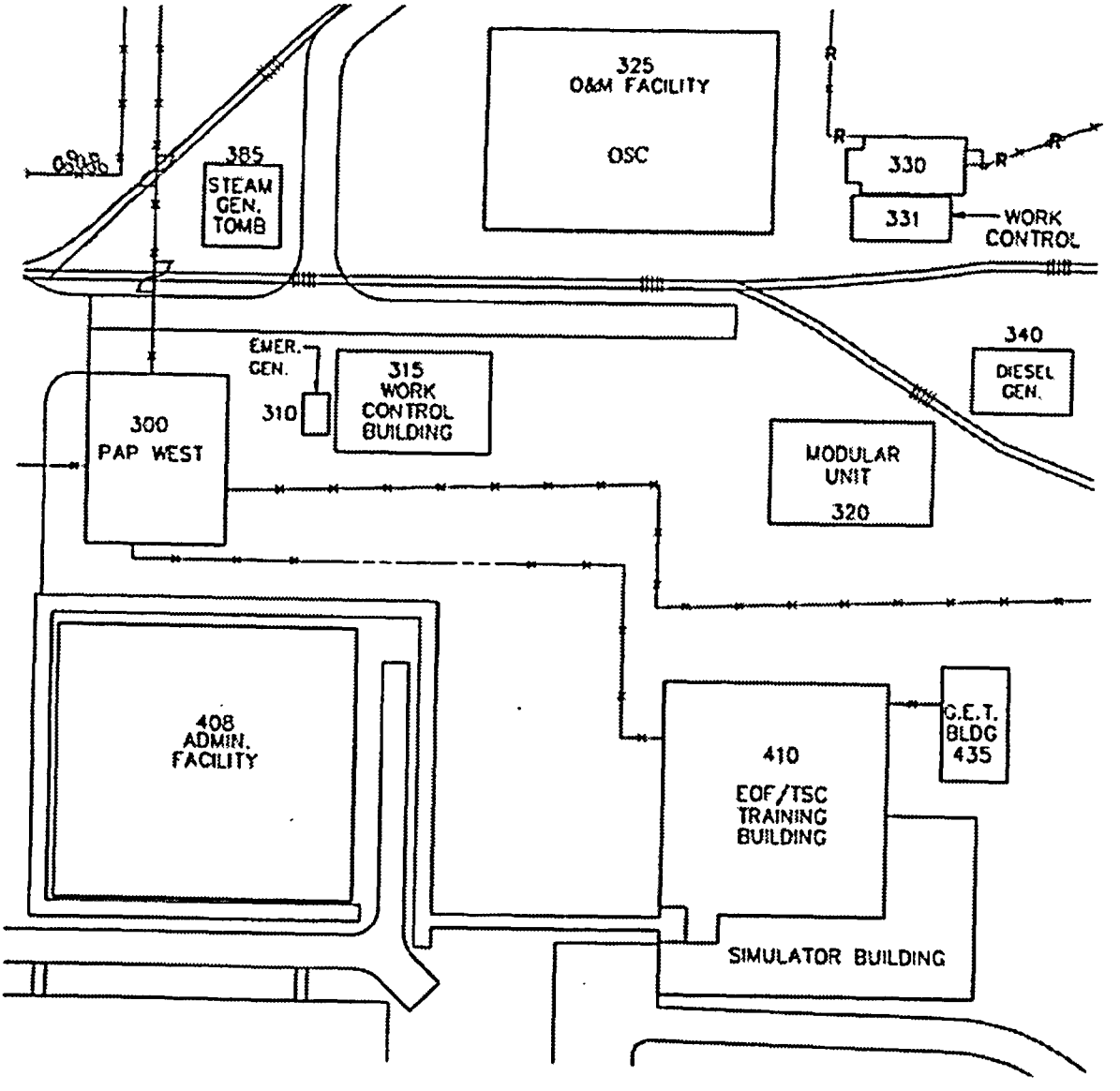
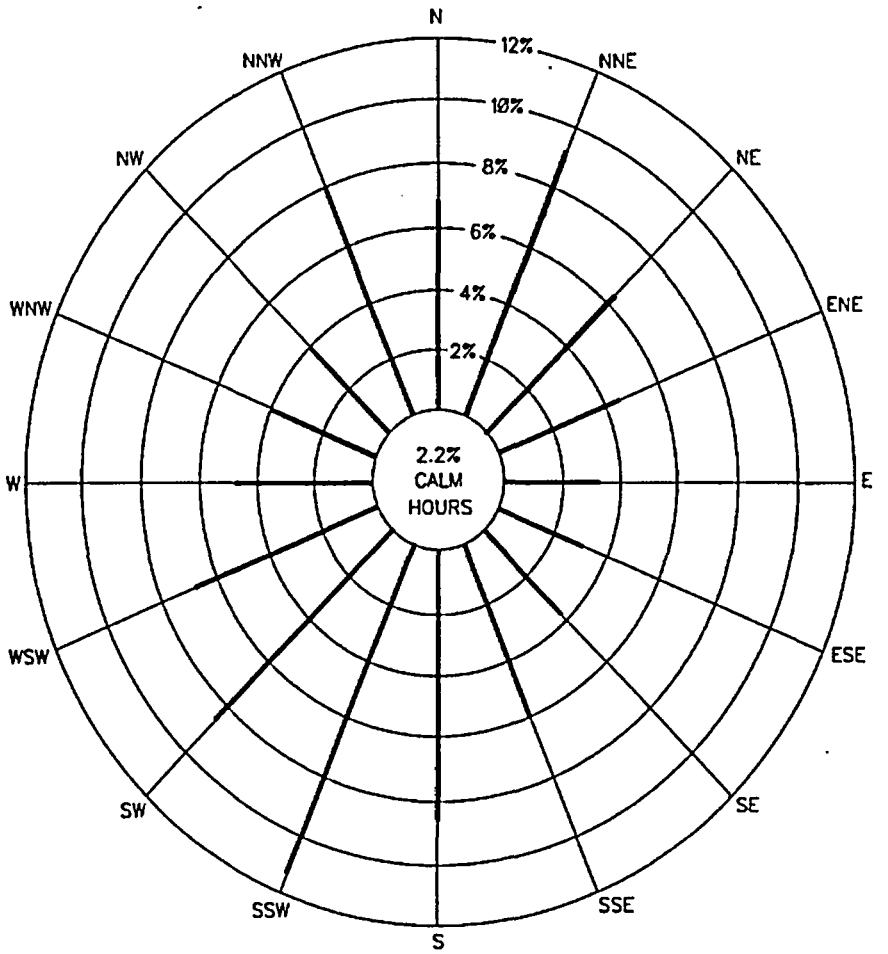


FIGURE 5.1.1-4
WIND ROSE FOR H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2



LOWER LEVEL DATA - 36 FEET AGL
AVERAGE VELOCITY - 5.10 MPH
DATA RECOVERY - 99.9%

FIGURE 5.1.1-5
50 - MILE INGESTION EXPOSURE EPZ

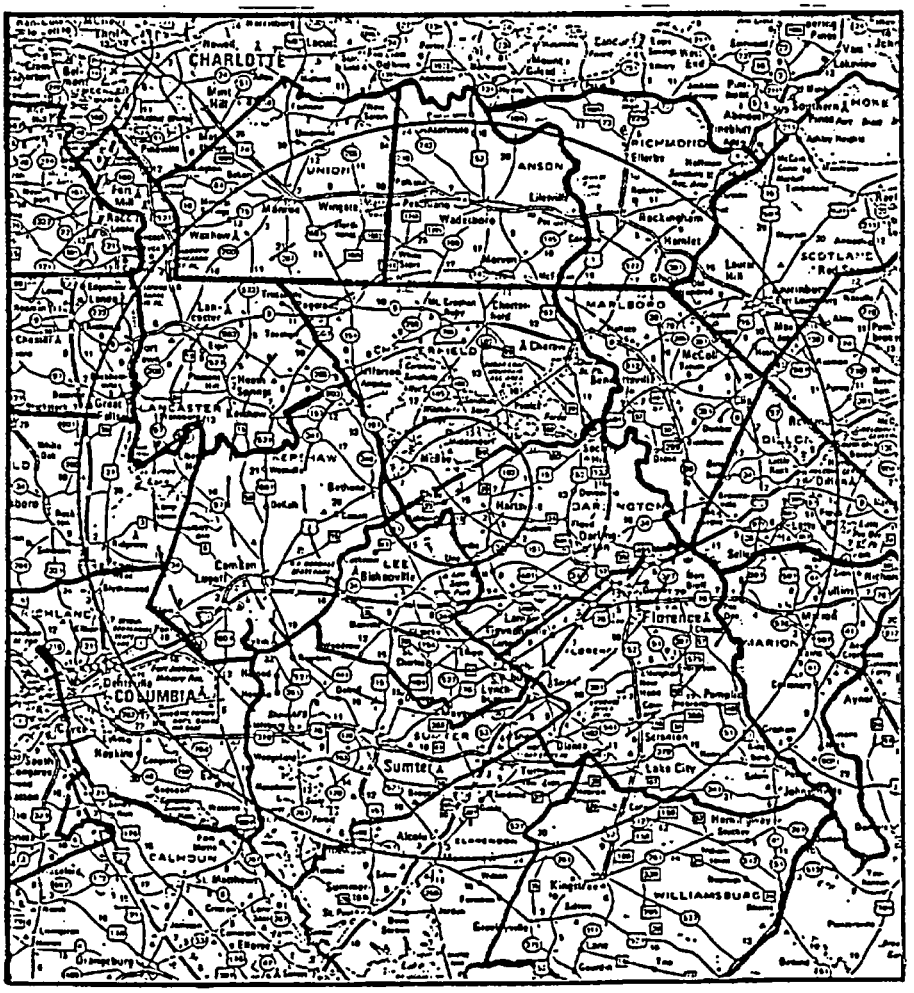
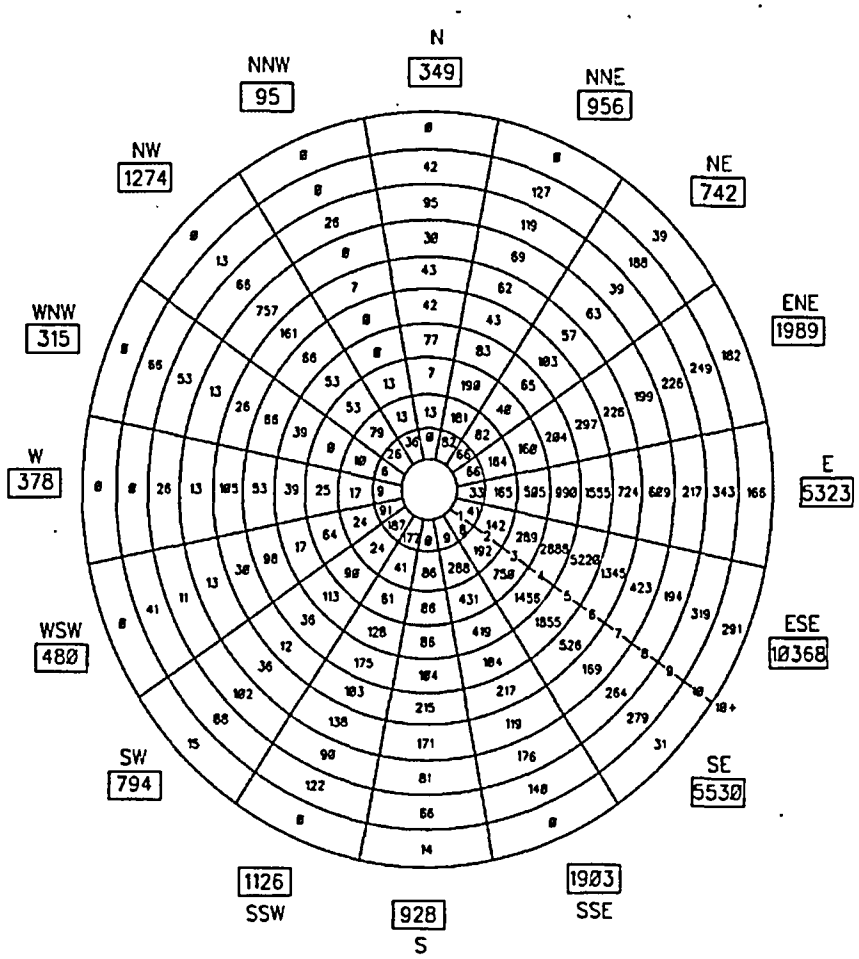
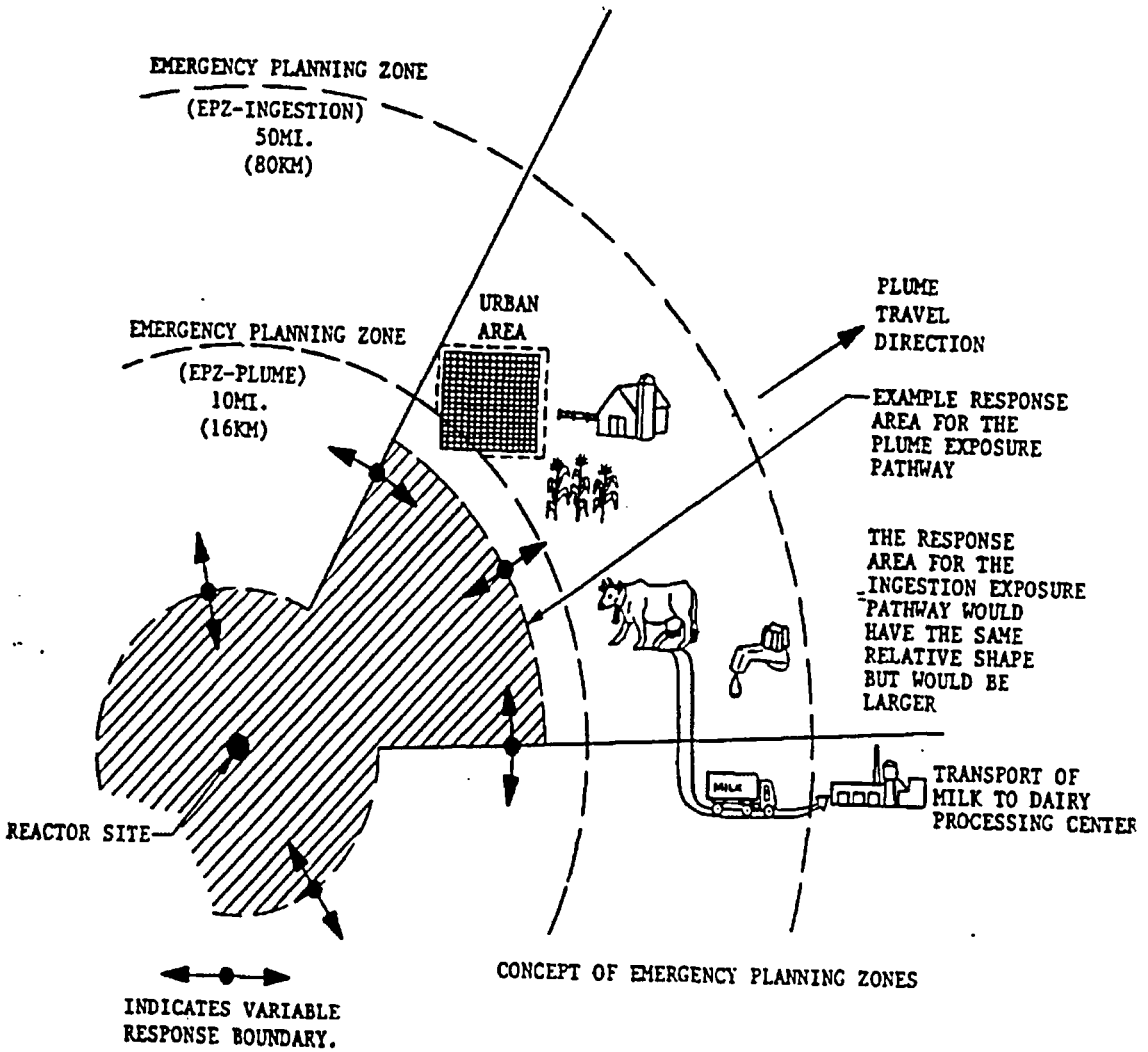


FIGURE 5.1.1-6
HBRSEP SITE SECTOR PERMANENT POPULATION TOTALS



RING POPULATION		CUMULATIVE POPULATION	
0-1 MILE	467	0-1 MILE	467
1-2 MILES	837	1-2 MILES	1304
2-3 MILES	1521	2-3 MILES	2825
3-4 MILES	2764	3-4 MILES	5589
4-5 MILES	5857	4-5 MILES	11446
5-10+ MILES	21104	5-10+ MILES	32550

FIGURE 5.1.1-7
CONCEPT OF EMERGENCY PLANNING ZONES



5.2 Emergency Classifications

A key element of this Plan is a pre-planned system of notifying and activating various emergency response organizations. This system, in accordance with NRC recommendations, uses graded levels of emergency response where the actions specified are organized according to the general severity of the emergency condition.

This section discusses the criteria for determining the level of the emergency condition. It also illustrates how a decision is made to declare that an emergency exists by providing example initiating conditions that could correspond to each emergency class. Section 5.3, "Emergency Response Organization", in turn will discuss the plans for notification of offsite agencies and mobilization of emergency teams and how they may vary with the level of the emergency.

5.2.1 General Classification System

The four classes of emergency are Unusual Event (equivalent to NRC Notification of Unusual Event), Alert, Site Area Emergency, and General Emergency. The operating staff is provided formal training to recognize off-normal plant conditions and categorize them within the parameters of the four emergency classes.

Emergency action levels are based upon the fission product barrier concept and upon events. The three barriers that protect the public from a release of radioactive fission products (fission product barriers, FPB) are the fuel cladding, the reactor coolant system boundary, and the containment. This concept has its basis in NUREG-0654, Appendix 1 where emergency events are found that correspond to failures or jeopardy of the three basic fission product barriers. The concept used is that if any one of the fission product barriers are in jeopardy or breached, an Alert will be declared. If any combination of two barriers are either in jeopardy or breached, a Site Area Emergency is declared. If all three are in any combination of jeopardy or breach, a General Emergency is declared. The categorization of events in NUREG-0654, Appendix 1 for Unusual Events are separately evaluated as they may be precursors to events that degrade plant safety.

5.2.1 (Continued)

In addition to looking at the status of fission product barriers, the emergency action levels include the NUREG-0654 emergency action level events that are external to the plant, i.e., natural or man-made disaster phenomena, or are not directly attributable to the condition of the reactor, i.e., shutdown systems, fire, dose projections. These events based on Emergency Action Levels (EAL) are direct precursors to loss or jeopardy of the FPBs.

The categorization of events according to one of the four emergency classes is implemented through the (EAL) system. The system is composed of two subsystems: The Unusual Event Matrix and the EAL Flowpath. The Unusual Event Matrix provides a set of plant conditions and events which coincide with the conditions associated with the Unusual Event. The Unusual Event Matrix is presented at the bottom of EAL-2 in Attachment 6.9. For the upper three emergency classes, the Emergency Action Level (EAL) System uses an integrated set of flowchart instructions. As with the Unusual Event Action Levels, the EAL System also associates plant conditions and events with the three upper classes of emergency, but it does so through a symptomatic methodology. Attachment 6.9 contains the flowcharts which together form the EAL Network.

The Site Emergency Coordinator (or the Shift Supervisor/Superintendent Shift Operations when no emergency has been declared) will declare any one of the four emergency classes where EALs have been exceeded, or in his/her judgment, the status of plant warrants such a declaration.

Each of the four emergency classes are discussed below.

5.2.2 Unusual Event

An Unusual Event is declared when events are in process or have occurred which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occur.

5.2.2 (Continued)

Determination of an Unusual Event (or any emergency condition) may be accomplished in one or more of the following ways:

- Observations/inspections
- Automatic alarms (e.g., Radiation and Process Monitoring Systems)
- Communications from others (e.g., warnings of severe natural phenomena by the National Weather Service)

As in all cases, the Site Emergency Coordinator will declare an Unusual Event in any circumstance where, in his/her judgment, the status of the plant warrants it. Emergency Action Levels are established for determination of this class. Specific EALs for an Unusual Event are listed in the Unusual Event Matrix of EAL-2.

An Unusual Event does not require the activation of the entire emergency organization, but the Site Emergency Coordinator can direct that additional personnel come to the site to support shift workers. Offsite emergency organizations shall be notified as necessary for informational purposes and aid from off-site fire fighting, medical services, and security organizations can be requested.

Notifications are discussed in Section 5.3.5, "Notification and Activation", and emergency measures to be taken are described in Section 5.4, "Emergency Measures." Specific emergency actions to be followed during an Unusual Event are contained in EPCLA-01, "Emergency Control."

5.2.3 Alert

An Alert is declared when events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any releases are expected to be limited to small fractions of the EPA Protective Action Guides.

Emergency Action Levels are established for determination of an Alert and are contained in EAL Flowcharts EAL-1 and 2. Additionally, the Site Emergency Coordinator will declare an Alert whenever he/she concludes that plant conditions so warrant.

5.2.3 (Continued)

Offsite assessment actions will be initiated to ensure that radiation levels in the environment do not require protective actions offsite. Normally the OSC, TSC, EOF and JIC will be activated at the Alert level, however, for events of short duration the SEC has discretion for activation of any or all of the facilities. Notifications and activation of emergency organizations are discussed in Section 5.3.5, and the emergency measures to be taken are described in Section 5.4. Specific emergency actions to be followed during an Alert are contained in EPCLA-01, "Emergency Control."

5.2.4 Site Area Emergency

A Site Area Emergency is declared when events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any releases are not expected to exceed EPA Protective Action Guides except near the site boundary.

Emergency Action Levels are established for determination of the Site Area Emergency class and are contained in EAL Flowpaths EAL-1 and 2. Additionally, the Site Emergency Coordinator will declare a Site Area Emergency whenever he/she concludes that plant conditions so warrant.

The Site Area Emergency class is more severe than the Alert class because significant radiation releases may occur. However, most of the initiating conditions associated with the Site Area Emergency class do not result in an immediate release and may never result in a significant release if emergency repairs are successful.

Although immediate protective actions are not automatically required, declaration of a Site Area Emergency will result in activation of the OSC, TSC, EOF, and JIC and will result in a site evacuation unless this action would jeopardize the health and safety of plant employees. Section 5.3.5, "Notification and Activation", discusses the planned process of notification and activation of emergency organizations. Emergency measures to be taken are described in Section 5.4, "Emergency Measures." Specific emergency actions to be followed during a Site Area Emergency are contained in EPCLA-01, "Emergency Control."

5.2.5 General Emergency

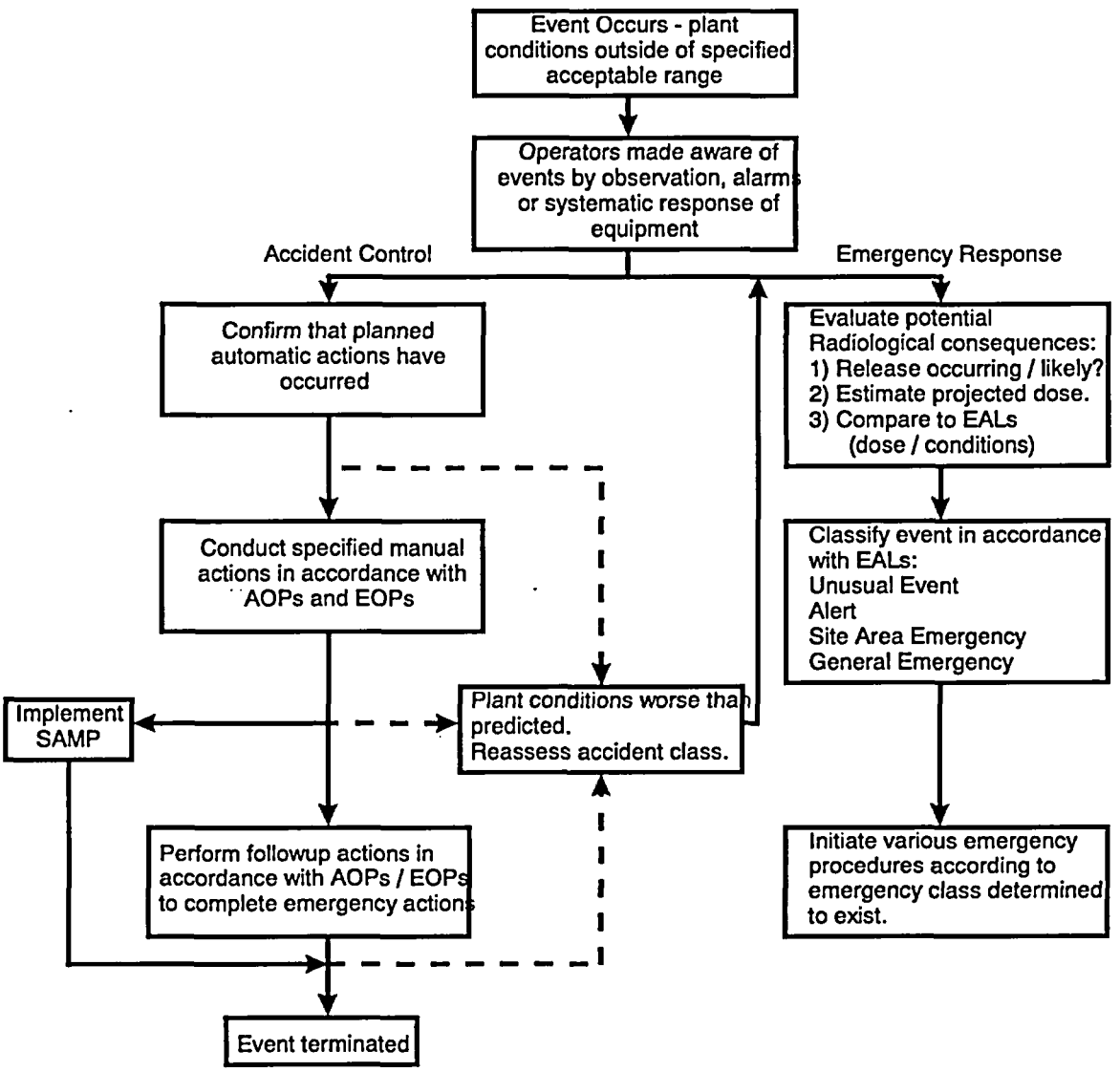
A General Emergency is declared when events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Releases can reasonably be expected to exceed EPA Protective Action Guides offsite for more than the immediate site area.

Emergency Action Levels are established for determination of the General Emergency class and are contained in EAL Flowpaths EAL-1 and 2. Additionally, the Site Emergency Coordinator will declare a General Emergency whenever, in his/her judgment, conditions exist that warrant activation of emergency response efforts including offsite monitoring and prompt public notification.

The General Emergency class includes accident conditions that involve severe core damage or melting. Such conditions will result in major releases to the primary containment and extremely high levels of contamination in the reactor coolant. Releases to the environment may be kept low unless leak paths in the primary containment develop (as from containment failure or failures in pumps, valves and other equipment which circulate reactor coolant outside primary containment).

If major releases do occur, it is probable that they will occur hours to days after the onset of the emergency and that offsite exposures will approach or exceed EPA recommended protective action guides unless protective measures are instituted. Response sequence to off-normal conditions are shown in Figure 5.2-1, "Response Sequence to Off Normal Conditions." Notifications and activation of emergency organizations are discussed in Section 5.3.5, "Notification and Activation." The emergency measures to be taken are described in Section 5.4, "Emergency Measures." Specific emergency actions to be followed during a General Emergency are contained in EPCLA-01, "Emergency Control."

FIGURE 5.2-1
RESPONSE SEQUENCE TO OFF-NORMAL CONDITIONS



AOP - Abnormal Operating Procedure
EOP - Emergency Operating Procedure
EAL - Emergency Action Level
SAMP - Severe Accident Management Program

5.3 Emergency Response Organization

There are requirements for action in an emergency that go beyond those encountered during routine operations. To meet these extra demands and provide an effective response to the emergency, the Robinson Emergency Plan employs an organizational concept that has four features.

- Whenever the Plan is activated (i.e., an EAL is exceeded), a single individual is charged with the responsibility for and authority to direct all actions necessary to respond to the emergency.

- The primary responsibility of the individual in charge is to assure that all critical actions (emergency response functions) are carried out. Upon activation of the Plan, the individual in charge is freed of all other responsibilities and thus able to devote their entire effort to managing the emergency response.

- Specific individuals are assigned the responsibility of carrying out predefined critical actions.

- There is a mechanism established to provide additional resources as necessary to respond to the emergency, which provides continuity of response on each critical action.

This concept of organization is compatible with and integrated into the normal mode of operation. The operating crew is routinely required to correct minor malfunctions of equipment and to diagnose the consequences of radioactivity releases. There are a number of procedures to guide operators in responding to equipment malfunctions and instrument alarms. There are also procedures to maintain effective control over contamination and radiation exposures. Emergency procedures basically involve an extension of these existing plant procedures.

Organizational control of emergencies is accomplished in several steps. First, as is discussed in Section 5.2, "Emergency Classifications", conditions associated with the various emergency classes are clearly defined. Second, emergency response functions are specified with levels of action appropriate to each emergency class (e.g., notification, offsite radiation monitoring, etc.). Third, individuals are assigned to be responsible for carrying out each emergency response function, with the assignments to cover all phases of the emergency - from its initial declaration to the final recovery operations.

5.3 (Continued)

Finally, the position of Site Emergency Coordinator is established to be activated immediately on declaration of an emergency. To that individual is delegated the immediate and unilateral authority to act on behalf of the Company to manage and direct all emergency operations involving the facility. Upon activation of the EOF, the Emergency Response Manager assumes responsibility of overall emergency response and performs those requirements for all offsite related activities. The Site Emergency Coordinator maintains focus for onsite emergency response and reports to the Emergency Response Manager.

Initially the Site Emergency Coordinator would be the Shift Supervisor/Superintendent Shift Operations. This individual would act in that capacity until formally relieved by the designated Site Emergency Coordinator. In this manner, the individual usually in charge of activities in the Control Room is responsible for initiating the necessary emergency response, but Plant Management is expected to manage the emergency response as soon as available to do so in anticipation of the possible wide-ranging responsibilities associated with managing a major emergency.

This section of the plan delineates the various emergency actions and separates them into groups of related functions. These functions are then assigned to emergency "teams" with designated Directors who are responsible to the Site Emergency Coordinator for the performance of the activities required to fulfill those functions.

Upon the declaration of an emergency, specified on-shift individuals are assigned as interim leaders (i.e., a designated interim leader is always available on site). Such individuals assume the responsibility for performing the required emergency response actions until properly relieved by the assigned team Director or one of the alternates. All team Directors, alternates, and interim leaders are trained as described in Section 5.6.1.1, "Training."

If necessary, the Site Emergency Coordinator will allocate available resources based on existing plant conditions. Where necessary, additional personnel will be notified and requested to augment onsite personnel. Any personnel who are augmented will be screened in accordance with Fitness for Duty Regulations.

5.3 (Continued)

A current callout list of the Emergency Response Organization phone numbers is maintained by Emergency Preparedness in the Robinson Nuclear Plant Emergency Response Organization Phone Book located in the Emergency Response Facilities onsite. Names in the Robinson Nuclear Plant Emergency Response Organization Phone Book are generated from the ERO Data Base. The emergency phone listings shall be verified quarterly and updated as necessary. Since most of the HBRSEP management staff and substantial numbers of its support personnel live in the site vicinity (i.e., Hartsville and surrounding areas) additional assistance can be quickly provided.

5.3.1 Normal Operating Organization

The Plan utilizes the basic plant organizational structure and available manpower as the principal means of responding to an emergency condition.

There are, of course, times when the full complement of staff are unavailable, just as there are times when one or a few key supervisory officials are away from the plant. Therefore, the shift organization must be prepared to provide the initial response to an emergency. The following on-shift expertise will be maintained 24 hours per day:

When the Reactor Coolant System is above 200°F (Mode 1, 2, 3, 4)

One Shift Supervisor/Superintendent Shift Operations (SRO), one Shift Technical Advisor, one Control Room Shift Supervisor/Senior Control Operator (SRO), two Control Room Operators (RO), three additional shift personnel, one Health Physics Technician, one Chemistry Technician, and Security personnel as required by the Security Plan. An SRO who meets the requirements of Shift Technical Advisor may act in both capacities.

When the Reactor Coolant System is at or below 200°F (Mode 5, 6)

One Shift Supervisor/Superintendent Shift Operations (SRO), two Control Room Operators (RO), four additional shift personnel, one Health Physics Technician, one Chemistry Technician, and Security personnel as required by the Security Plan.

The above listed shift complements meet or exceed the requirements of Technical Specifications and may be one less than listed for a period of time not to exceed 2 hours.

As will be described below, the general approach is to assign all necessary emergency response functions to the individuals on site. Each individual, on declaration of an emergency, would be responsible for carrying out one or more emergency actions until additional personnel arrive on site. These shift personnel are identified as "interim" team leaders. It should be noted that they are initially responsible under all circumstances, and remain so until relieved by the designated team leader (or alternate). This arrangement provides for a clear and uniform assignment of responsibility and provides a mechanism to assure that all important emergency response functions are dealt with from the very beginning of the accident.

1. Plant Operators

   During an emergency, the Plant Operators (including the Shift Supervisor/Superintendent Shift Operations) are the nucleus of the initial effort to control the plant and take steps to protect the public.

   The Plant Operators' primary responsibility is to carry out assigned actions necessary during an emergency to provide initial emergency response per established Emergency Operating Procedures and perform initial calculations of projected offsite consequences. Specific emergency response duties of the Plant Operators are found in the Emergency Procedures which implement the Plan and in the Emergency Operating Procedures.

5.3.1 (Continued)

2. Emergency Communicator (EC)

The Emergency Communicator is designated by the ERO data base which is maintained by Emergency Preparedness. The Emergency Communicator reports to the Site Emergency Coordinator (or the Emergency Response Manager (ERM) when the EOF is activated) and functions as the liaison between the SEC/ERM and the Offsite agencies. The EC also initiates augmentation of onsite and on call personnel at the direction of the SEC or ERM. Specifically, this individual assists in the preparation of messages, and upon approval relays these messages to the proper individuals or agencies. This individual uses the "agency specific" communicators to transmit the majority of this information. The EC uses the communication equipment discussed in ATTACHMENT 6.1, "Communications Systems." These responsibilities and objectives, along with agency specific communicators are contained in EPNOT-01, "CR/EOF Emergency Communicators."

5.3.2 Onsite Emergency Response Organization

The minimum onsite emergency organization for non-normal working hours, backshifts, and holidays for HBRSEP is described above in Section 5.3.1, "Normal Operating Organization", Compliance with the staffing level goals of NUREG-0654, Revision 1, Table B-1, has been assured. Guidance for augmenting the emergency organization is found in the Emergency Response Organization Phone Book and the Emergency Procedures. Individual's names and roles in the emergency organization, phone numbers, and alternates are also described in the Emergency Response Organization Phone Book and maintained in onsite Emergency Response Facilities and with Non Responding Emergency Communicators. Personnel may be contacted by the use of pagers and the Dialogic notification system.

5.3.2 (Continued)

The Company is committed to provide staffing to effectively contain any emergency which might occur at its nuclear facilities. Depending on the emergency at hand, personnel will be contacted with required expertise on a priority basis. The minimum staffing is shown in Table 5.3.2-1, "HBRSEP Emergency Response Organization." Since a large portion of the staff lives in the vicinity of the plant, additional personnel will be available for communications, onsite and offsite Radiological assessment, repair and corrective actions and technical support within a short period of time. Depending on weather conditions, 30-45 minutes should provide enough time to make the appropriate staff available to augment the onsite organization. The onsite organization will continue to be augmented such that within 60-75 minutes after notification, additional personnel will be added to provide the necessary support and will meet the intent of NUREG-0654, Revision 1, Table B-1. Additional personnel will continue to supplement the plant emergency organization, as necessary to meet the requirements of this Plan. An augmentation drill requiring travel to the site shall be conducted at least once every 24 months. This may be performed as part of a quarterly drill, exercise or real event.

As an aid toward assuring that critical emergency actions are given proper attention, the plant's emergency procedures provide for emergency "teams" (or individual assignments) established to carry out specific types of functions such as accident assessment and offsite notification. As discussed below, the leader and members of each team have been selected with an aim toward making a smooth and rapid transition to the emergency mode of operation. The emergency response organization is shown in Figure 5.3.2-1, "HBRSEP Emergency Response Organization."

5.3.2 (Continued)

The functions specifically assigned to each element of the emergency response organization are intended to encompass all critical response functions, from command and control to communications. One function assigned to each is that of record keeping. Typical of the records to be maintained are the emergency communications, the radiation records (i.e., surveys, projected dose calculations, personnel/population-at-risk evacuations, etc.), the sequence of events (i.e., the managerial decisions and essential occurrences that evolve throughout the emergency), and the security/accountability record (i.e., who is presently on each team or at each center and any security threats). The following sections describe the specific emergency assignments, which are kept current in the Plan's implementing procedures. The team members' telephone numbers are kept current in an EP Data Base. In all emergencies, the on-duty Shift Supervisor/Superintendent Shift Operations or Control Room Shift Supervisor/Senior Control Operator is authorized and qualified to implement the Plan and to classify the emergency condition.

1. Technical Support Center (TSC)

   The Site Emergency Coordinator is responsible for managing a wide range of activities at the plant. To assist the Site Emergency Coordinator in this effort and to implement his/her directives, a Technical Analysis Director and Accident Assessment Team has been established. Upon declaration of an Alert, Site Area Emergency, or General Emergency, the Technical Analysis Director and Accident Assessment Team will be notified to assemble per Table 5.3.2-1 (Technical Support).

5.3.2.1 (Continued)

The various technical and administrative functions to be performed at the plant have been grouped into six categories similar to the organization for routine operations plus Emergency Communications. These are as follows:

Plant Operations

Emergency Repair

Logistics Support

Radiological Control

Engineering Support

Emergency Communications

Directors/Managers are assigned to be responsible for activities within each category. Each of the above functions will be supported in either the TSC or EOF. An Emergency Communicator is assigned the responsibility of communications activities.

The Directors within the Technical Support Center may be relieved by designated plant personnel or subsequently by qualified personnel from other Progress Energy locations, such as the Raleigh General Office, Shearon Harris Nuclear Power Plant, Harris Energy & Environmental Center, Brunswick Steam Electric Plant, or Crystal River Unit 3.

5.3.2.1 (Continued)

a. Site Emergency Coordinator (SEC)

As discussed in Section 5.3.1, "Normal Operating Organization", direction and coordination of emergency actions, until relieved by the Emergency Response Manager, are prime responsibilities of the Site Emergency Coordinator. The initial determination that an emergency exists will usually be made at the Control Room, based on measured plant parameters. The Shift Supervisor/Superintendent Shift Operations or other qualified Site Emergency Coordinator available at the time an emergency condition exists will initially be the Site Emergency Coordinator. He/she will be in command of the onsite emergency organization until relieved by another qualified individual. The Shift Supervisor/Superintendent Shift Operations will be relieved as soon as possible so that he/she may devote his/her attention to plant operations. If the Shift Supervisor/Superintendent Shift Operations becomes incapacitated for any reason, the Control Room Shift Supervisor/Senior Control Operator will assume the responsibilities of the Site Emergency Coordinator until relieved. The Site Emergency Coordinator will divert use of the plant public address system or other methods at his/her disposal to announce the necessary information and to activate the appropriate emergency teams. He/she will also contact the Emergency Communicator who will relay messages and maintain records throughout the emergency.

Any individual who may be required to serve, even temporarily, in the capacity of a Site Emergency Coordinator will be trained to do so.

The primary responsibilities of the Site Emergency Coordinator include the following:

1. Coordinating and directing, (making use of the Engineering personnel), the combined activities of personnel in the Control Room, Technical Support Center, Operational Support Center, and elsewhere on the site.

2. Classifying the emergency.

3. Notifying offsite plant, corporate, and local agency personnel, as well as onsite personnel, as delineated in the procedures which implement the Plan. (Upon activation of the Emergency Operations Facility, the Emergency Response Manager provides liaison between the Site Emergency Coordinator and all offsite agencies.)

4. Issuing instructions to the emergency teams and assuring that the appropriate procedures are being followed.

5. Initiating protective actions to be taken on site, if required.

6. Determining the advisability of re-entry operations during or immediately following an emergency situation.

7. Directing health physics activities until the arrival at the site of the Radiological Control Director.

8. Assuring continuity of onsite resources.

9. Requesting Federal assistance as needed.

10. Declaring the emergency over.

Until relieved by the Emergency Response Manager, the Site Emergency Coordinator may not delegate the responsibility to make the decision to notify and make protective action recommendations to authorities responsible for offsite emergency measures. Further, while he/she may consult with others, he/she may not delegate the responsibility to declare that the emergency has been terminated. He/she may delegate the responsibility to announce that the emergency has been terminated. He/she may delegate the responsibility and authority for mobilization of recovery efforts while that emergency still exists provided that such efforts in no way interfere with or detract from the response to the emergency.

Other responsibilities may be delegated to other emergency organizational units as necessary for expeditiously carrying out the requirements of the Plan and procedures which implement the Plan.

b. Plant Operations Director (POD)

The Plant Operations Director is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Site Emergency Coordinator for providing liaison with the Control Operators, Shift Supervisor/Superintendent Shift Operations and Technical Analysis Manager (after activation of the Emergency Operations Facility). He/she is also responsible for providing technical direction to the Control Operators, and the Fire Brigade. Responsibilities of this position are contained in EPTSC-02, "Plant Operations Director."

5.3.2.1 (Continued)

c. Emergency Repair Director (ERD)

The Emergency Repair Director is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Site Emergency Coordinator for the management of efforts to repair and maintain equipment during an emergency, install emergency structures, systems and components, and perform mitigation and clean-up activities during an emergency. These responsibilities include providing technical and administrative direction to the Operational Support Center Leader. Responsibilities of this position are contained in EPTSC-03, "Emergency Repair Director."

d. Radiological Control Director (RCD)

The Radiological Control Director is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Site Emergency Coordinator for managing the radiological monitoring and assessment aspects of the plant during an emergency; managing activities to control radiation exposure; providing technical and administrative direction to the Radiological Emergency Teams. This individual also provides liaison with the Radiological Control Manager after Emergency Operations Facility activation. Responsibilities of this position are contained in EPTSC-04, "Radiological Control Director."

e. Fire Protection (FP)

Initial response to fires within the protected area is provided by the Site Fire Brigade. The Fire Brigade is composed of personnel qualified in fire fighting procedures and practices. These personnel are directed by a Fire Brigade Incident Commander (FBIC) and report to the Superintendent - Shift Operations/Shift Supervisor (or Site Emergency Coordinator if an emergency has been declared and the TSC is not yet activated).

In cases where additional fire assistance is necessary, offsite help may be requested through the Darlington County 911 Center. Assessment of the effects of fire damage or system alignment will be performed by the Accident Assessment Team or responsible system engineer.

For a complete discussion, refer to the Plant Operating Manual, Volume 3, "Fire Protection Manual."

f. Emergency Security Team Leader (ESTL)

The Emergency Security Team is composed of members of the Security Force assigned to the plant. These personnel are trained in security, personnel accountability, and evacuation procedures and practices. Additionally, selected members are trained in first aid/search and rescue.

The Emergency Security Team Leader is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Administrative and Logistics Manager for providing direction to the Emergency Security Team during a declared emergency and providing liaison with the State and Local Law Enforcement Agencies and hospitals. After the Emergency Operations Facility is activated, coordination with State and Local Law Enforcement Agencies and hospitals will be provided by the Administrative and Logistics Manager. Responsibilities and objectives for the Emergency Security Team Leader are contained in EPTSC-06, "Emergency Security Team Leader."

g. Evacuation Assembly Area Leader

The Evacuation Assembly Area leader is normally a member of the Security Force. If the site is evacuated or an emergency assembly is initiated, this individual reports to the Emergency Security Team Leader from the designated assembly area. This individual is also responsible for liaison with the Emergency Security Team so that personnel accountability can be maintained. Responsibilities and objectives are contained in EPSPA-01, "Evacuation and Accountability."

h. Technical Analysis Director and Accident Assessment Team (TAD, AAT)

The Technical Analysis Director (TAD) is designated by the ERO Data Base which is maintained by Emergency Preparedness. He/she is responsible to the SEC for Accident Assessment. Duties and responsibilities for this function are contained in EPTSC-08, "Technical Analysis Director."

The specific responsibilities of the Accident Assessment Team are as follows:

- Analyze mechanical, electrical, instrument, and control problems and determine alternate solutions.
- Analyze thermohydraulic and thermohydrodynamic problems and develop alternate courses of action to resolve them.
- Analyze and evaluate accident conditions and develop guidance for the Site Emergency Coordinator and operations personnel on protection of the core.
- Perform core damage assessments when warranted.
- Support Dose Projection as needed.

Shift Technical Advisors, engineers, analysts, and other technical staff personnel will be assigned to this team by the Technical Analysis Director and will be under his/her direction.

i. Support Services Coordinator

The Support Services Coordinators are designated by the ERO data base which is maintained by Emergency Preparedness. As necessary, additional equipment, supplies and personnel can be obtained through contracts. These individuals report to the Administrative and Logistics Manager. Responsibilities for this function are the same as normal responsibilities and additional procedures are not required.

5.3.2 (Continued)

2. Emergency Operations Facility (EOF)

The Emergency Operations Facility is activated at the Alert classification. The Emergency Response Manager assumes leadership of the EOF.

a. Emergency Response Manager (ERM)

The Emergency Response Manager is designated by the ERO data base which is maintained by Emergency Preparedness.

The Emergency Response Manager is in charge of Progress Energy emergency response for the plant. This response is coordinated with offsite support personnel (Corporate Headquarters, Corporate Spokesperson, Media Team Leaders, State, County, and Federal agencies) and marshaling offsite support as required to support the Plant. The responsibilities and objectives of this position are contained in EPEOF-01, "Emergency Response Manager."

b. Administrative and Logistics Manager (ALM)

The Administrative and Logistics Manager is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible for providing assistance to the Emergency Response Manager and the Site Emergency Coordinator in administrative, logistics, communications, and personnel support. The responsibilities and objectives of this position are contained in EPEOF-03, "Administrative and Logistics Manager."

5.3.2.2 (Continued)

c. Technical Analysis Manager (TAM)

The Technical Analysis Manager is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Emergency Response Manager for coordinating technical information coming from the Technical Support Center, supplying the Emergency Response Manager with an assessment of the emergency, and providing interface to consultants, regulatory agencies, architect-engineers, and Westinghouse. The responsibilities and objectives of this position are contained in EPEOF-04, "Technical Analysis Manager."

d. Assistant to the Emergency Response Manager (AERM)

The assistant to the Emergency Response Manager is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Emergency Response Manager for: coordinating the information flow within the Emergency Operation Facility; providing assistance and support in the operation of the Emergency Operations Facility; providing advice regarding corrective actions, and public protective action recommendations; conducting briefings for emergency response personnel as directed by the Emergency Response Manager; and act as the liaison\representative between EOC representatives and the site. The responsibilities and objectives of this position are contained in EPEOF-07, "Assistant to the Emergency Response Manager."

e. Representative at the Emergency Operations Center

The EOC representatives are designated by the ERO data base which is maintained by Emergency Preparedness. These individuals act as a liaison between the plant emergency organization and the agencies at each State and County Emergency Operations Center. They will keep agency representatives informed of conditions at the plant and discuss plant recommendations for protective actions offsite as described in EPEOF-08, "Representative at the Emergency Operations Centers."

5.3.2.2 (Continued)

f. Radiological Control Manager (RCM)

The Radiological Control Manager is designated by the ERO data base which is maintained by Emergency Preparedness. This individual is responsible to the Emergency Response Manager for coordinating offsite radiological and environmental assessment and recommending protective actions necessary to protect health and safety of the public. The responsibilities and objectives of this position are contained in EPEOF-05, "Radiological Control Manager."

g. Radiological Emergency Teams

The Radiological Emergency Teams are designated by the ERO data base which is maintained by Emergency Preparedness. It consists of members of the Radiation Control organization and of other plant or offsite personnel who have received necessary training. Members of the teams who have not completed such training may be assigned to tasks in which they assist a qualified team member under his/her direct guidance.

The general functions of the various Radiological Emergency Teams include:

1. Determine and report onsite radiological conditions.
2. Determine and report offsite radiological conditions.
3. Establish areas to which access should be controlled for the purpose of minimizing personnel exposure.
4. Issue protective equipment and personnel gear.
5. Personnel decontamination services.
6. Determine and maintain records of personnel exposure.

These functional requirements are met by the establishment of teams discussed in the following paragraphs. Specific team assignments and duties including on-shift priorities of assignments are included in the various procedures. The procedures also give specific direction regarding the priority of roles to perform as off-duty members of the Radiological Emergency Teams arrive at the site.

h. Environmental Monitoring Team Leader and Team

The Environmental Monitoring Team Leader is designated by the ERO data base which is maintained by Emergency Preparedness. The position has Environmental and Radiation Control experience or receives equivalent position specific training and is responsible to the Radiological Control Manager for providing technical and administrative direction to the Environmental Monitoring Teams during a declared emergency. Upon activation of the Emergency Operations Facility, two Environmental Monitoring Teams will be made available for deployment. The Environmental Monitoring Team Leader will be responsible to the Radiological Control Manager in the Emergency Operations Facility. The responsibilities and objectives of the Environmental Monitoring Team Leader and Team are contained in EPEOF-02, "Environmental Monitoring Team Leader."

5.3.2.2 (Continued)

i. Dose Projection Team Leader (DPTL)

The Dose Projection Team Leader is designated by the ERO data base which is maintained by Emergency Preparedness. The position has Environmental and Radiation Control Unit experience or receives equivalent position specific training and is responsible to the Radiological Control Manager. Responsibilities and objectives of this position are contained in EPEOF-06, "Dose Projection Team Leader." Responsibilities of the Dose Projection Team include determining source terms and projecting onsite and offsite radiation dose commitment based on monitoring results.

j. Computer Support

The Computer Support position is designed by the ERO data base which is maintained by Emergency Preparedness. The position will normally be staffed by Information Technology personnel. These personnel report to the Administrative and Logistics Manager. Because these personnel perform their normal work function, no specific procedure is provided.

5.3.2 (Continued)

3. Operational Support Center (OSC)

The OSC is activated at the Alert level. It is staffed by Radiation Control, Environmental & Chemistry, Maintenance, Security, and Material & Control Services, and Operations field personnel. Operations field personnel report to the SSO/CR SEC. These personnel report, either directly or indirectly to the OSC Leader as described below.

a. *Operational Support Center Leader (OSCL)*

The Operational Support Center Leader is designated by the ERO data base which is maintained by Emergency Preparedness. Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an OSC Leader will report to the Emergency Repair Director. This individual will direct the activities and provide technical and administrative direction to those persons reporting to the OSC. These responsibilities and objectives are contained in EPOSC-01, "Operational Support Center Leader."

b. Damage Control Team Leader (DCTL)

The Damage Control Team Leader is designated by the ERO data base which is maintained by Emergency Preparedness. The Damage Control Team performs assessment of equipment damage and provides emergency repairs as directed. The Damage Control Team members will be selected by the OSC Leader, according to the nature of the task. Different teams will be formed to carry out different missions. Responsibilities and objectives of the Damage Control Team Leader are located in EPOSC-02, "Damage Control Team Leader."

5.3.3 Augmentation of Onsite Emergency Response Organization

If conditions at the plant degrade to the extent that further onsite assistance is needed, assistance is available from the Corporate personnel, other Progress Energy nuclear site personnel, contracted services, and certain locally available service groups, as described in the following subsections.

1. Corporate Communications Department (CCD)/Joint Information Center (JIC) personnel

   The Corporate Communications Function may be activated by the Corporate Communications personnel when notified that an Alert condition exists at HBRSEP. Activation is discretionary for lesser emergencies. The CCD will handle public and media inquires in the early stages of the event until the Joint Information Center is activated.

   a. Company Spokesperson

      The Company Spokesperson is designated by the ERO data base which is maintained by Emergency Preparedness, located in the JIC, has the following responsibilities:

      - Maintaining command and control of the JIC.
      - Ensuring adequate staffing of Progress Energy positions.
      - Ensuring a facility briefing of the JIC staff prior to JIC activation.
      - Ensuring adequate information is obtained from the EOF for News Media Briefings.
      - Ensuring Progress Energy News Releases are prepared and approved in a timely manner in the EOF.
      - Review news releases prepared by the EOF.
      - Ensuring the releases of information is coordinated with other Public Information Officials (PIO's) in the JIC.

- Conducting pre-News Media Briefing conferences with agency PIO's in the JIC.

- Relaying accurate and timely information to the news media through formal News Media Briefings.

- Ensuring the JIC staff is periodically briefed on the status of the emergency.

These responsibilities and objectives are contained in EPJIC-01, Company Spokesperson.

b. JIC Director

The JIC Director is designated by the ERO data base which is maintained by Emergency Preparedness. The position has the following responsibilities:

- Scheduling the JIC facility briefings with the Company Spokesperson.

- Coordinating and scheduling the News Media Briefings with other PIO's in the JIC.

- Coordinating the flow of information from the JIC to the Corporate Communications Department.

These responsibilities and objectives are contained in EPJIC-02, Joint Information Center Director.

c. Technical Spokesperson

The Technical Spokesperson is designated by the ERO data base which is maintained by Emergency Preparedness. The position has the following responsibilities:

- Gathering information from the EOF for News Media Briefings.

- Participating in News Media Briefings with other PIO's in the JIC.

5.3.3.1.c (Continued)

- Relaying timely, accurate and technical information to the media through formal News Media Briefings.
- Providing JIC facility briefings to the JIC staff when requested to do so by the Company Spokesperson.
- Acting as Company Spokesperson, if required.
- Interpreting technical information from the EOF for the JIC.
- Assisting the Public Information Coordinator with updating the Progress Energy Public Information Specialists event status board.
- Updating the Facility Activation, News Release/Press Conference and Emergency Classification Status Boards.

These responsibilities and objectives are contained in EPJIC-03, Technical Spokesperson.

d. Public Information Coordinator

The Public Information Coordinator is designed by the ERO data base. The position has the following responsibilities:

- Coordinate/monitor Public Information Specialist activities.
- Coordinate with State Rumor Control personnel.

These responsibilities and objectives are contained in EPJIC-04, Public Information Coordinator/Specialist.

5.3.3.1 (Continued)

e. Contracted Services

A number of active outside contracts are maintained in order to ensure continuing access to qualified personnel when and if they are needed to supplement Progress Energy resources. These contracts provide the capability of obtaining, on an expedited basis, additional maintenance support personnel (such as mechanics, electricians, and I&C Technicians), other technical personnel (such as Radiation Control and Environmental & Chemistry Technicians), and engineering and consulting services. For example, contracts are maintained with Westinghouse and Washington Group.

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:

- Assistance to the affected utility in locating emergency resources and equipment.
- Analysis of the operational aspects of the incident.
- Dissemination to member utilities of information concerning the incident.
- 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 Emergency Response Manager and will assist in coordinating INPO's response to the emergency.

2. Local Services Support

The H. B. Robinson Steam Electric Plant, Unit No. 2 is equipped and staffed to cope with many types of emergency situations. However, if a fire or other type of incident occurs that requires outside assistance, such assistance is available as described in the following subsections.

a. Medical Assistance

Carolina Pines Regional Medical Center has medical facilities immediately available for the treatment of contaminated and non-contaminated injured personnel. Chesterfield General Hospital in Cheraw, South Carolina, will serve as the back-up facility, should Carolina Pines Regional Medical Center become full or uninhabitable.

In addition, the Radiation Emergency Assistance Center Training Site (REACTS) located at Oak Ridge, Tennessee will provide advice and assistance to HBRSEP in the event of a severe radiation accident.

In addition, medical assistance is available on or offsite from a group of physicians in the Hartsville area, who are on the staff of Carolina Pines Regional Medical Center and who have agreed to provide medical assistance to contaminated patients. (See ATTACHMENT 6.5, Medical Treatment and Assistance, for more details.)

5.3.3.2 (Continued)

b. Ambulance Service

The Lake Robinson Rescue Squad and the Darlington County Emergency Medical Service have agreed to respond to emergency calls from the plant, just as they respond to other calls from the Hartsville area. Ambulance assistance may be requested through the Darlington County 911 Center. A copy of the response agreement with these Rescue Squads and ambulance service are maintained with the Emergency Preparedness Staff.

c. Fire Assistance

Agencies with fire protection resources in the vicinity of HBRSEP are as follows:

Fire Protection resources will be dispatched through the Darlington County 911 Center.

The Darlington County Fire District is the primary fire protection response agency for HBRSEP and will coordinate assistance activities, if required, of the other above agencies. A copy of the agreement with the County Fire District is maintained with the Emergency Preparedness Staff.

5.3.4 Coordination with Participating Governmental Agencies

A summary of each governmental organization having major responsibilities for the planning and response to HBRSEP radiological emergencies is described below; comprehensive summary tables of emergency response organizations are included in ATTACHMENT 6.3, "HBRSEP Unit No. 2 Offsite Agency Support Summary", and a detailed description of the authority, responsibilities, and duties of each organization is presented in their respective emergency plans. Each of these organizations having response duties is capable of providing such on a 24-hour-per-day basis.

5.3.4 (Continued)

1. State of South Carolina

The state officials and agencies identified in the State Plans have overall command, coordination, and support responsibilities.

In particular, part 2 of South Carolina Operational Radiological Emergency Response Plan (SCORERP) establishes the responsibilities and duties of agencies lying within the Plume Exposure EPZ as follows.

a. Office of the Governor

- Provide state direction, control, and guidance.
- Provide a representative at the SEOC.
- Direct release of information relating to a radiological incident at HBRSEP.

b. Office of the Adjutant General (OTAG)

- Assist the Governor in providing State direction, control, and guidance.
- Provide representatives at the SEOC.
- Assist in decontamination in coordination with DHEC through the National Guard.
- Assist the Office of the Governor in public information.

c. Department of Health & Environmental Control (DHEC), Bureau of Land and Waste Management

- Maintain a radiological hazard assessment capability and provide radiological technical support, coordination, and guidance for the State. Prepare supporting technical Radiological Emergency Response Plan.
- Provide representatives at HBRSEP and the SEOC.

- Obtain and coordinate radiological assistance resources from the federal government, other states, and the nuclear industry as required.
- Direct monitoring efforts in the 50-mile ingestion pathway EPZ.
- Coordinate decontamination and/or disposal procedures.
- Coordinate radiological medical health care.
- Assist the Office of the Governor with public information.

d. Emergency Management Division (EMD), Office of the Adjutant General

- Assure preparation and maintenance of the South Carolina Operational Radiological Emergency Response Plan for state areas which could be affected by an emergency at HBRSEP.
- Provide SEOC capability and control.
- Coordinate offsite support from state, federal, and other agencies.
- Provide and/or coordinate with DHEC the radiological emergency response training of state and local government personnel.
- Assist, in coordination with DHEC, the Federal Government and the Nuclear Industry, in the development and conduct of radiological emergency response drills and exercises.
- Provide, in coordination with DHEC, for review and update of state and local government Radiological Emergency Response Plans.

- Maintain liaison and coordination with State Civil Defense Agencies in adjoining states in planning for and executing Radiological Emergency Operations for interstate hazards.
- Assist DHEC in decontamination recovery control procedures.
- Operate the 24 hour Warning Point for the State of South Carolina.

These items are discussed in the Memorandum Of Understanding. A copy of this memorandum is on file with the Emergency Preparedness Staff.

e. Clemson University Cooperative Extension Service

- Assist in the decontamination or disposal of livestock, feed, milk, and other contaminated farm products in coordination with DHEC.
- Maintain agricultural data required for radiological assessment in the ingestion pathway in coordination with DHEC.
- Provide representative to DHEC and SEOC.

f. Forestry Commission

Assist in decontamination in coordination with DHEC.

g. Division of General Services

Assist in decontamination through urban and rural fire services in coordination with DHEC.

h. Department of Public Safety

- Coordinate traffic control support.
- Provide security for the SEOC.
- Assist Office of the Governor with public information.

5.3.4.1 (Continued)

i. Department of Social Services

- Coordinate Reception Center operations.
- Coordinate emergency welfare services for evacuees.

j. South Carolina Educational Television

- Provide radiological emergency television and radio coverage of the affected area(s) from the SEOC and the Joint Information Center.
- Assist in communications.

k. Department of Transportation

Operate the 24 Hour Backup Warning Point for the state.

2. Darlington County

a. Darlington County Emergency Preparedness Agency

The Darlington County Emergency Preparedness Agency has overall responsibility for Darlington County's radiological emergency response planning, development, and updating of Darlington County's emergency response plan, and coordination between the County and Progress Energy and other local government response agencies. It functions as the lead county agency for radiological monitoring and decontamination activities as directed by the South Carolina Department of Health and Environmental Control. Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

b. Darlington County Sheriff's Department

The Sheriff's Department emergency response functions are:

- Coordinate all local law enforcement and traffic control.
- Provide immediate assistance to facility management and local authorities during initial onset of the emergency.

- Provide traffic control in support of evacuation.
- Re-route traffic around contaminated areas and report traffic problems to the County Emergency Operations Center.
- Provide traffic control in the vicinity of shelter areas.
- Establish road blocks, re-route traffic, and prevent entry into contaminated zones.
- Provide assistance to municipal law enforcement agencies in warning and evacuating persons in designated zones.
- Provide security for county property.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

c. Darlington County 911 Center

The Darlington County 911 Center emergency response functions are:

- Operate the county warning point on a 24-hour basis.
- Provide dispatch services for Emergency Response.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

5.3.4 (Continued)

3. Lee County

a. Lee County Disaster Preparedness Agency

The Lee County Disaster Preparedness Agency has overall responsibility for Lee County's radiological emergency response planning, development, and updating of Lee County's emergency response plan, and coordination between the County, Progress Energy, and other local government response agencies. It functions as the lead county radiological response agency and provides any required radiological monitoring and decontamination activities as directed by the South Carolina Department of Health and Environmental Control.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

b. Lee County Sheriff's Department

The Sheriff's Department emergency response functions are:

- Coordinate all local law enforcement and traffic control.
- Provide immediate assistance to facility management and local authorities during initial onset of the emergency.
- Provide traffic control in support of evacuation.
- Re-route traffic around contaminated areas and report traffic problems to the County Emergency Operations Center.
- Provide traffic control in the vicinity of shelter areas.
- Establish road blocks, re-route traffic, and prevent entry into contaminated zones.
- Provide assistance to municipal law enforcement agencies in warning and evacuating persons in designated zones.

- Provide security for county property.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

c. Lee County Enhanced 911 Facility

The Lee County Enhanced 911 Facility emergency response functions are:

- Operate the county warning point on a 24-hour basis.
- Provide dispatch services for Emergency Response.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

4. Chesterfield County

a. Chesterfield County Emergency Preparedness Agency

The Chesterfield County Emergency Preparedness Agency has overall responsibility for Chesterfield County's radiological emergency response planning, development, and updating of Chesterfield County's emergency response plan, and coordination between the County, Progress Energy, and other local government response agencies. It functions as the lead county radiological response agency and provides any required radiological monitoring and decontamination activities as directed by the South Carolina Department of Health and Environmental Control.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

5.3.4 (Continued)

b. Chesterfield County Sheriff's Department

The Chesterfield County Sheriff's Department emergency response functions are:

- Coordinate all local law enforcement and traffic control.
- Operate the county warning point on a 24-hour basis.
- Provide immediate assistance to facility management and local authorities during initial onset of the emergency.
- Provide traffic control in support of evacuation.
- Re-route traffic around contaminated areas and report traffic problems to the County Emergency Operations Center.
- Provide traffic control in the vicinity of shelter areas.
- Establish road blocks, re-route traffic, and prevent entry into contaminated zones.

- Provide assistance to municipal law enforcement agencies in warning and evacuating persons in designated zones.

- Provide security for county property.

Specific items of interface are discussed in the Letter of Agreement. A copy of this agreement is on file with the Emergency Preparedness Staff.

5. Federal Agencies

a. Department of Energy, Savannah River Operations Office

The Savannah River Operations Office coordinates, under the Federal Radiological Monitoring Assessment Plan (FRMAP), federal resources as required to: minimize accidental radiation exposure; minimize the spread of radioactive materials into the environment; and carry out countermeasures to control and eliminate radiation hazards. Upon request of the Site Emergency Coordinator (or the Emergency Response Manager after the Emergency Operations Facility is activated) or of the State of South Carolina, Department of Health and Environmental Control, Department of Energy will: provide equipment, supplies, and personnel to evaluate radiological hazards and to minimize radiation exposures; assist in carrying out emergency response operations and implementing protective actions; and provide an aerial radiological measuring system for mapping radioactive plumes. Resources available in the area to facilitate federal assistance include the Hartsville Airport, located approximately four miles from HBRSEP. The Darlington National Guard Armory located in Darlington, South Carolina could be used as a Federal Command Post meeting the requirements of FRMAP.

b. Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency coordinates, through the Atlanta, Georgia (Region IV) Office, federal response as required to supplement FRMAP.

c. Nuclear Regulatory Commission (NRC)

The Nuclear Regulatory Commission provides two resident inspectors at HBRSEP. The NRC provides additional technical advice, technical assistance, and personnel during and following a radiological emergency in accordance with their emergency plan and federal regulations. The Directorate of Regulatory Operations will be notified of radiation incidents in accordance with 10CFR20.2202 and will conduct appropriate investigative activities.

d. Weather Service

The National Weather Service in Columbia, South Carolina will provide meteorological information during emergency situations, if required. Severe weather watches and warnings will be issued by the National Weather Service Station at Wilmington, North Carolina. Data available will include existing and forecasted surface wind directions, wind speed with azimuth variability, and ambient surface air temperature.

6. Agreements

ATTACHMENT 6.2, "Letter of Agreement" presents the list of agreements. Copies of the agreements are on file with the Emergency Preparedness Staff.

5.3.5 Notification and Activation

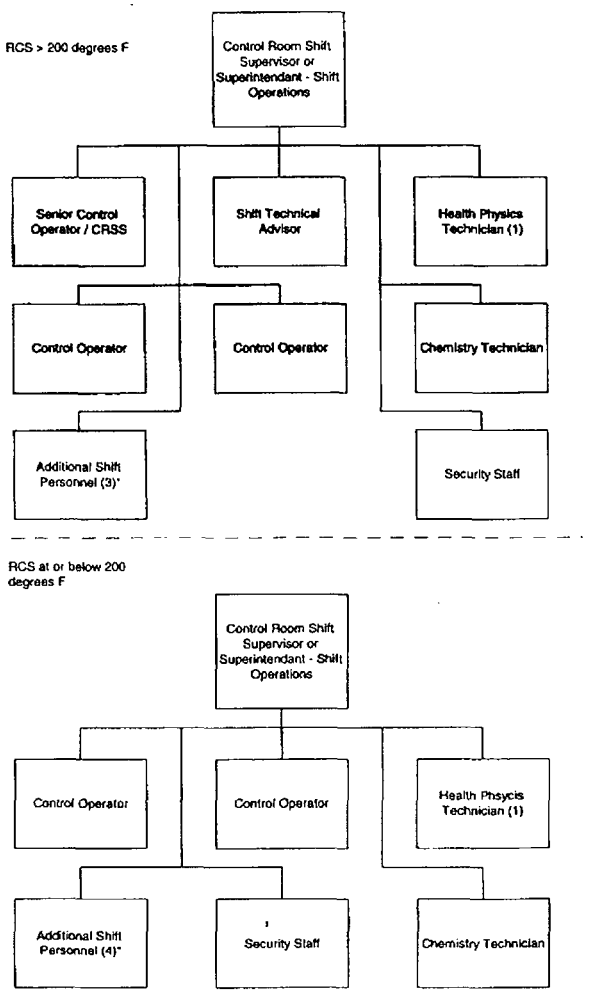
Notification and activation of the onsite and offsite emergency response organizations is dependent upon the emergency classification and is listed in Table 5.3.5-1, "Notification and Activation of Principle Emergency Response Organizations." Details of notification responsibilities are described in the Plan's implementing procedures. The communications systems utilized to make these notifications are described in ATTACHMENT 6.1, "Communications Systems." The Dialogic notification system may be used to aid in the callout of ERO personnel.

Any time that an emergency is reclassified, the initial notification scheme will apply.

The State of South Carolina and the Counties of Darlington, Lee, and Chesterfield are responsible for the process of notification of the public.

Prewritten emergency messages to be used for public notification are contained in the procedures of the State of South Carolina, and Darlington, Lee, and Chesterfield Counties.

FIGURE 5.3.1-1
HBRSEP SHIFT ORGANIZATION



* Fire Protection Technical Aide or an Auxiliary Operator on shift.

FIGURE 5.3.2-1
HBRSEP EMERGENCY RESPONSE ORGANIZATION

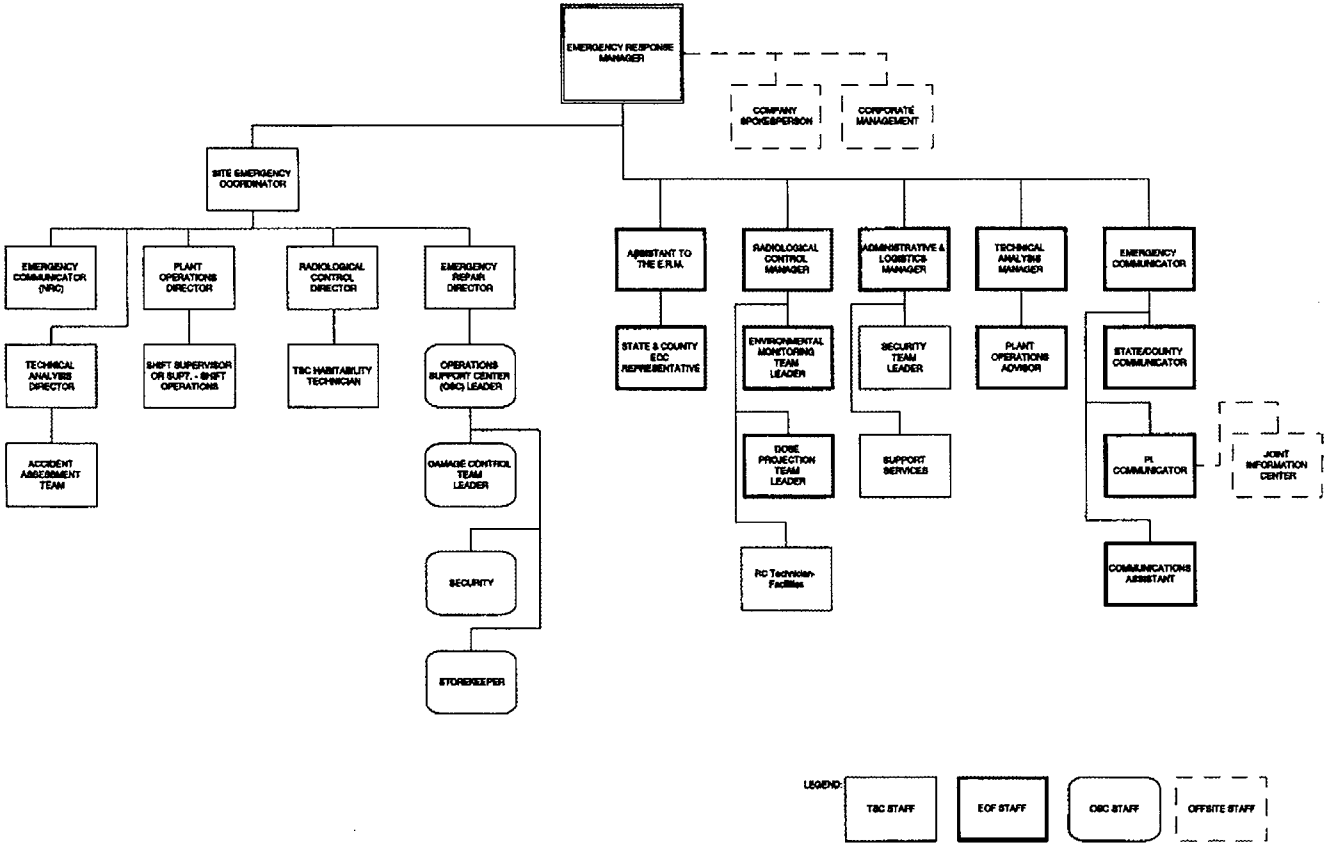


TABLE 5.3.2-1
ONSHIFT AND ADDITIONAL STAFFING FOR EMERGENCIES

NUREG 0654 Major Functional Area	NUREG 0654 Major Tasks	NUREG 0654 Position Title or Expertise	HBRSEP Onshift Position Title	On Shift*	Capability for Additions		
					30-45 min.	60-75 min.	HBRSEP On-Call Position Title
Plant Operations and Assessment of Operational Aspects		Superintendent Shift Operations (SRO) Superintendent Shift Operations(SRO) Control Room Operators Auxiliary Operators	Superintendent Shift Operations Control Room Shift Supervisor Control Operators Auxiliary Operators	1 1 2 2			N/A
Emergency Direction and Control (Emergency Coordinator) ***		Shift Technical Advisor, Superintendent Shift Operations or Designated Facility Manager	Superintendent - Shift Operations or Control Room Shift Supervisor	1**		1	Site Emergency Coordinator
Notification/ Communication****	Notify licensee, state, local, and federal personnel & maintain communication		AO or STA	1	1	1 1	Emergency Communicator, State/County Communicator, NRC Communicator
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Operations Facility (EOF) director Offsite dose assessment	Senior Manager Senior Health Physics (HP) expertise	N/A		1	1	Emergency Response Manager Dose Projection Team Leader
	Offsite surveys Onsite (out-of-plant) Inplant surveys Chemistry/ radio-chemistry	HP technicians Rad/Chem technicians	RC Technician Chemistry Technician	1 1	2 1 1	2 1 1 1	Environmental Monitoring RC Technician Facilities RC Technician Facilities Chemistry Technician

TABLE 5.3.2-1 (Continued)
ONSHIFT AND ADDITIONAL STAFFING FOR EMERGENCIES

NUREG 0654 Major Functional Area	NUREG 0654 Major Tasks	NUREG 0654 Position Title or Expertise	HBRSEP Onshift Position Title	On Shift*	Capability for Additions		
					30-45 min.	60-75 min.	HBRSEP On-Call Position Title
Plant System Engineering, Repair and Corrective Actions	Technical Support	Shift technical advisor Core/thermal hydraulics Electrical Mechanical	STA	1 – 	1	 1 1	Reactor Engineer Accident Assessment - Electrical Accident Assessment - Mechanical
	Repair and corrective actions	Mechanical maintenance/ Radwaste operator Electrical maintenance/ instrument and control (I&C) technician	AO AO	1** 1**	1 1	2 1	Damage Control-Mechanical Damage Control-Electrical Damage Control-Electrical
Protective Actions (In-Plant)	Radiation protection: a. Access control b. HP Coverage for repair, corrective actions, search and rescue first-aid, & firefighting c. Personnel monitoring d. Dosimetry	HP technicians	RC Technician, Chemistry Technician, AOs	2**	2	2	RC Technician Damage Control
Firefighting	--	--	Designated Fire Brigade	Fire brigade per OMM-002	Local support	--	N/A
Rescue Operations and First-Aid	--	--	Security, RC Technician, Chemistry Technician	1** 1**	Local support	--	N/A

TABLE 5.3.2-1 (Continued)
ONSHIFT AND ADDITIONAL STAFFING FOR EMERGENCIES

NUREG 0654 Major Functional Area	NUREG 0654 Major Tasks	NUREG 0654 Position Title or Expertise	HBRSEP Onshift Position Title	On Shift*	Capability for Additions		
					30-45 min.	60-75 min.	HBRSEP On-Call Position Title
Site Access Control and Personnel Accountability	Security, firefighting communications, personnel accountability	Security personnel	Security	All per security plan	--	--	N/A
		Total		10	11	16	

*For each unaffected nuclear unit in operation, maintain at least one Superintendent Shift Operations, one control room operator, and one auxiliary operator except that units sharing a control room may share a shift foreman if all functions are covered.

**May be provided by shift personnel assigned other functions.

***Overall direction of facility response to be assumed by EOF director (ERM) when all centers are fully manned. Direction of minute-to-minute facility operations remains with senior manager in technical support center or control room.

****May be performed by engineering aide to Control Room Shift Supervisor/Superintendent Shift Operations.

TABLE 5.3.5-1
NOTIFICATION AND ACTIVATION OF PRINCIPAL EMERGENCY RESPONSE ORGANIZATIONS

Agency	Unusual Event	Alert	Site Area Emergency	General Emergency
Onsite:				
Plant Operators	Activate	Activate	Activate	Activate
Radiological Emergency Teams	(a),(c)	Activate	Activate	Activate
Technical Support Center	(a),(c)	Activate	Activate	Activate
Other Emergency Teams	(a),(c)	(a),(c)	(a),(c)	(a),(c)
Emergency Operations Facility	(a),(c)	Activate	Activate	Activate
Operational Support Center	(a),(c)	Activate	Activate	Activate
Offsite:				
Joint Information Center	(a),(c)	Activate	Activate	Activate
Corporate Headquarters	Notify(a)	Notify(a)	Activate	Activate
State of South Carolina	Notify	Notify(a)	Activate	Activate
Darlington County	Notify	Notify(a)	Activate	Activate
Lee County	Notify	Notify(a)	Activate	Activate
Chesterfield County	Notify	Notify(a)	Activate	Activate
United States Nuclear Regulatory Commission	Notify	Notify	Activate	Activate
American Nuclear Insurers	(c)	Notify	Notify	Activate
Carolina Pines Regional Medical Center	(b),(d)	(b),(d)	(b),(d)	(b),(d)

TABLE 5.3.5-1 (Continued)
NOTIFICATION AND ACTIVATION OF PRINCIPAL EMERGENCY RESPONSE ORGANIZATIONS

Agency	Unusual Event	Alert	Site Area Emergency	General Emergency
Chesterfield General Hospital	(b),(d)	(b),(d)	(b),(d)	(b),(d)
Hartsville and/or Lake Robinson Rescue Squads	(b),(d)	(b),(d)	(b),(d)	(b),(d)
Darlington County Fire District	(b)	(b)	(b)	(b)
Westinghouse	(a),(c)	(a),(c)	(a),(c)	(a), (c)
Washington Group	(a),(c)	(a),(c)	(a),(c)	(a), (c)
INPO	(c)	Notify,(b)	Notify,(b)	Notify,(b)

(a) Mobilize, if deemed necessary.

(b) Request assistance, if required.

(c) Notify, if deemed necessary.

(d) Communications link between mobile and fixed medical support facilities is by radio and beepers.

FIGURE 5.3.5-1
INTERFACES FOR UNUSUAL EVENT

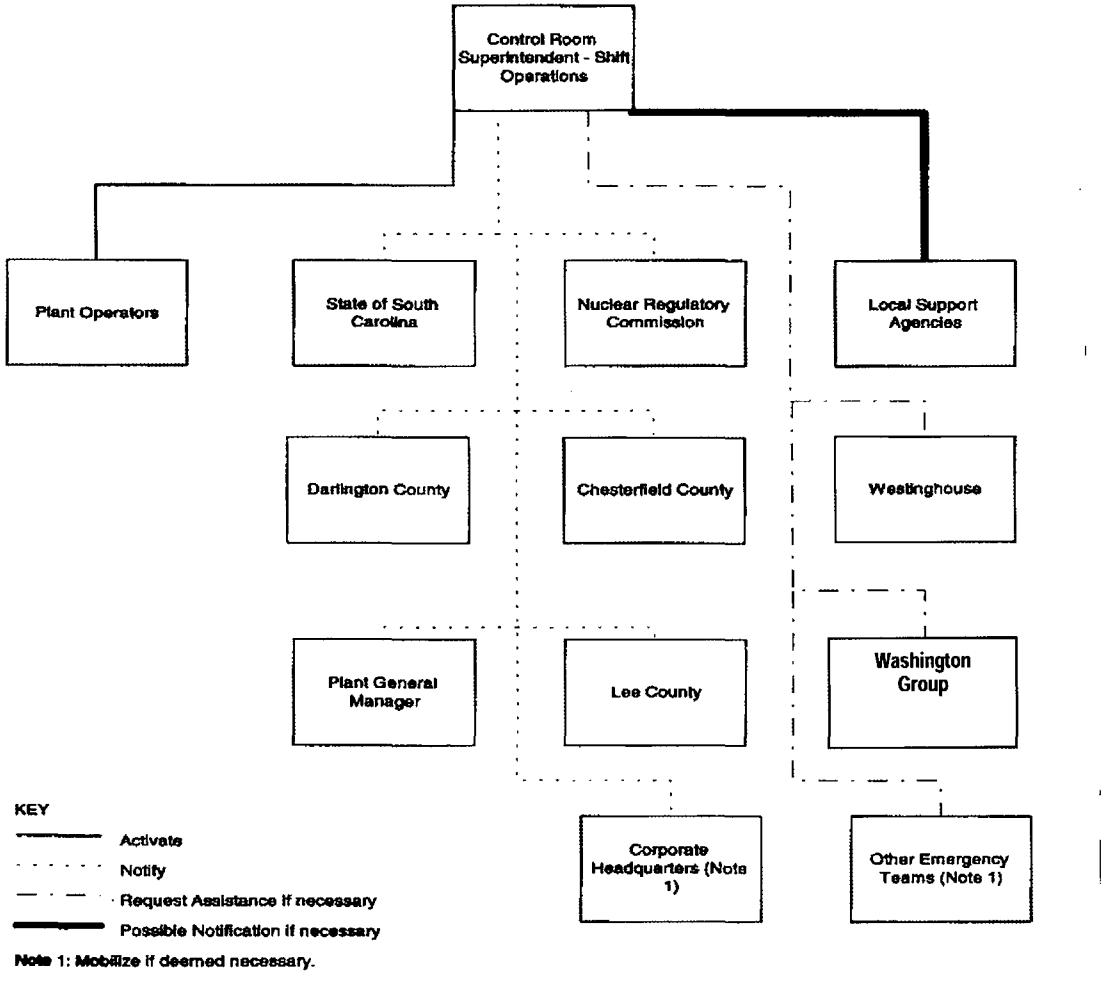


FIGURE 5.3.5-2
INTERFACES FOR ALERT

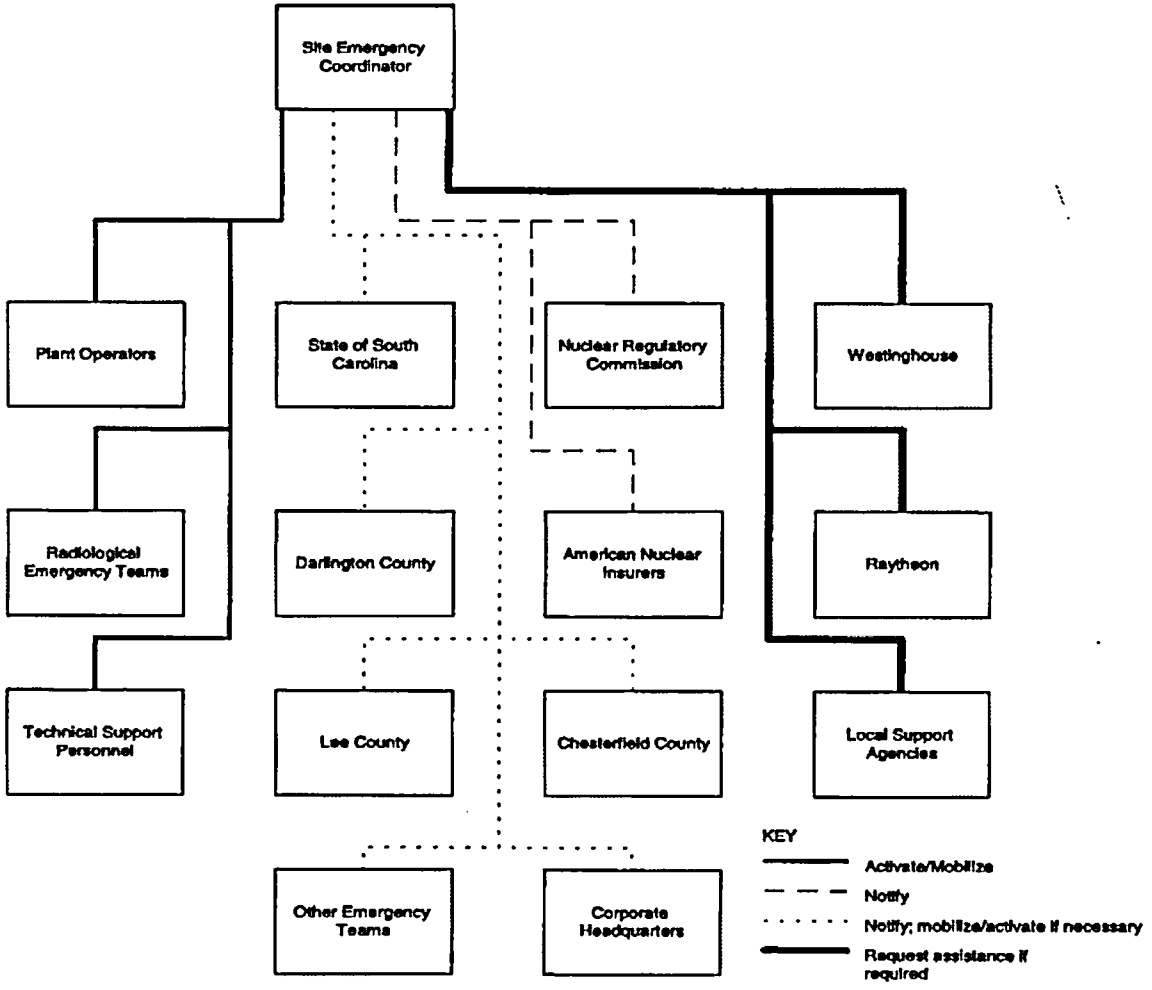


FIGURE 5.3.5-3
INTERFACES FOR SITE AREA EMERGENCY PRIOR TO EOF ACTIVATION

(Deleted)

FIGURE 5.3.5-4
INTERFACES FOR SITE AREA EMERGENCY

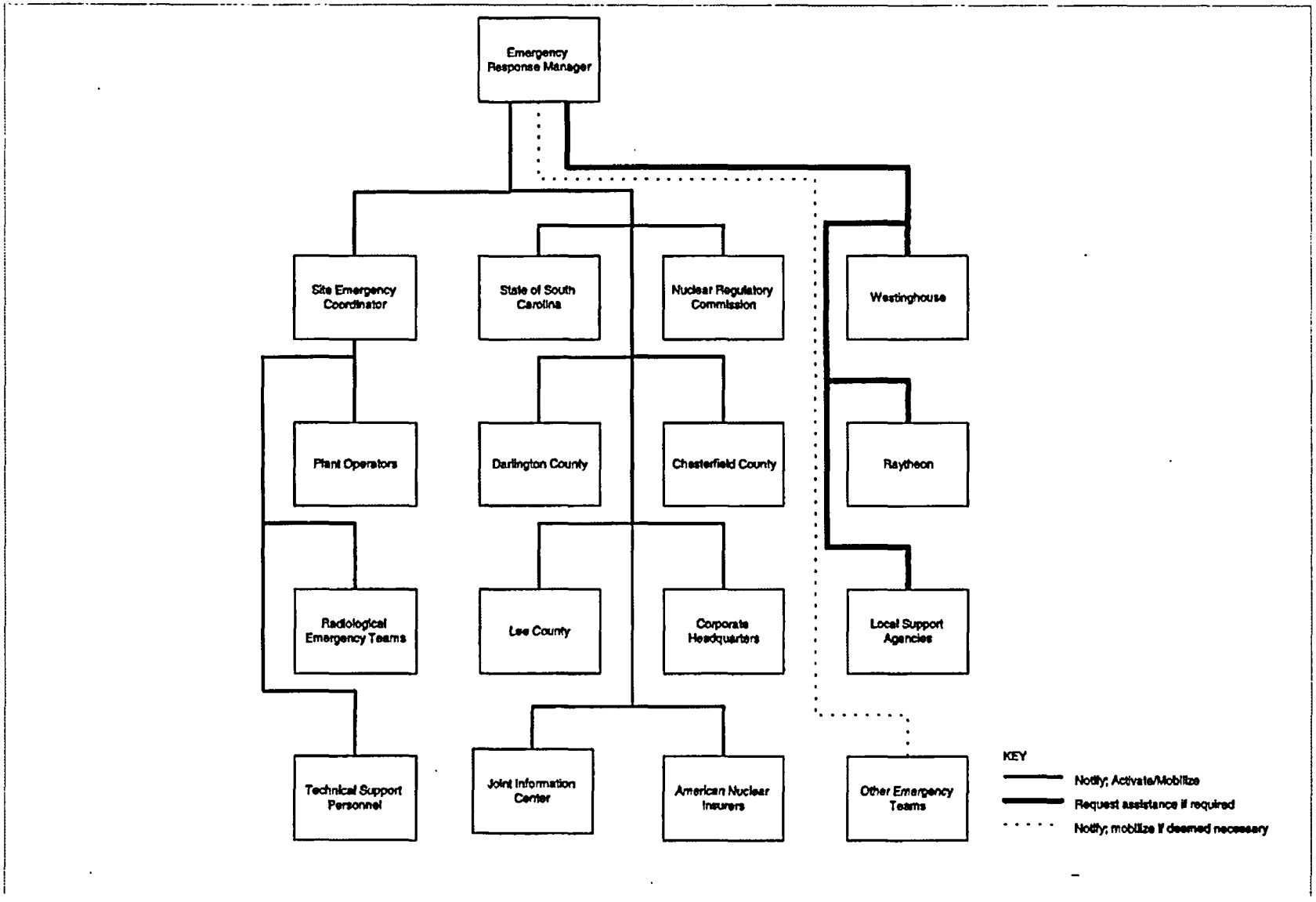
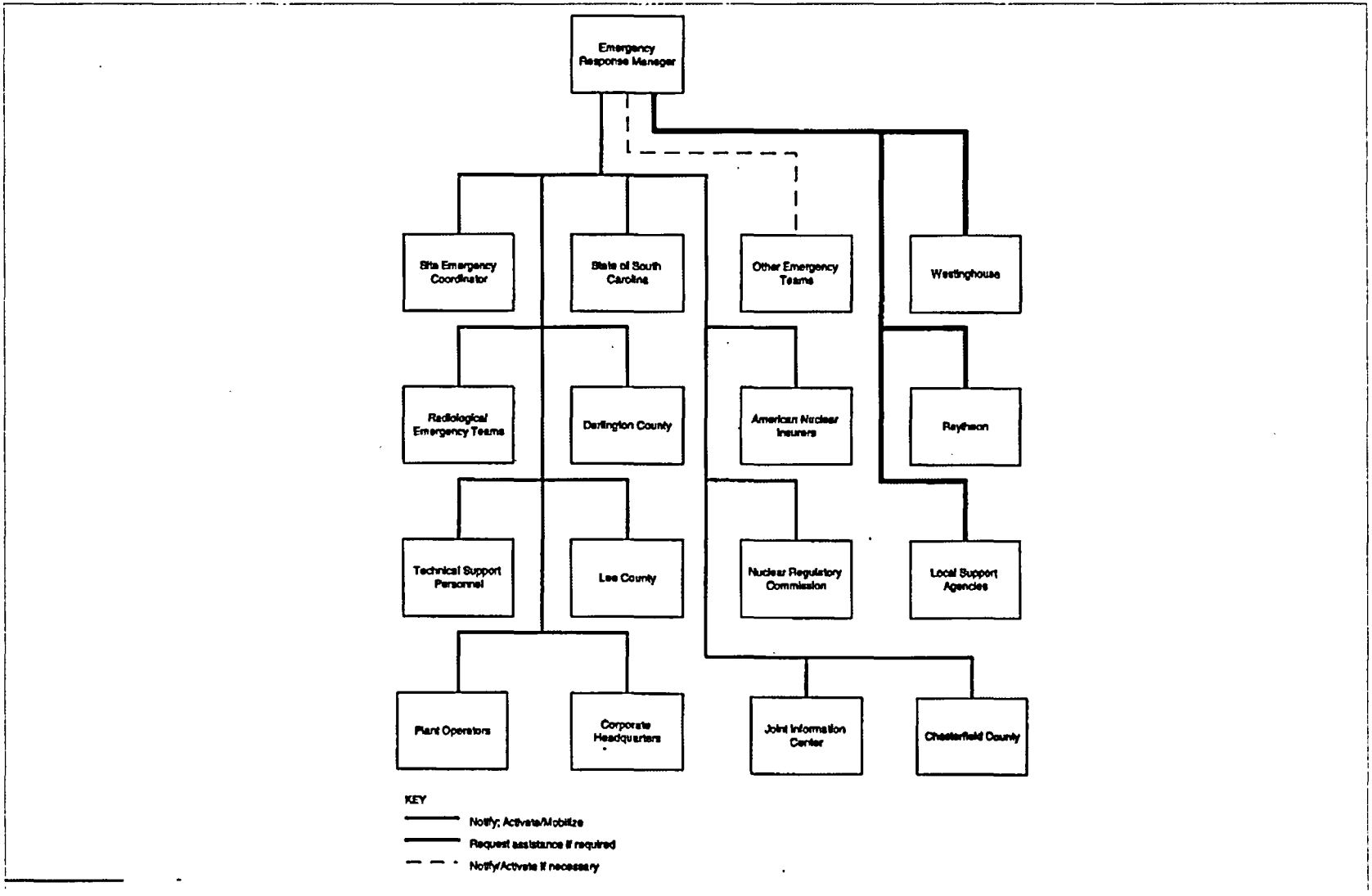


FIGURE 5.3.5-5
INTERFACES FOR GENERAL EMERGENCY PRIOR TO EOF ACTIVATION

(Deleted)

FIGURE 5.3.5-6
INTERFACES FOR GENERAL EMERGENCY



5.4 Emergency Measures

This section identifies the measures to be taken for each class of emergency described in Section 5.2, "Emergency Classifications." The measures presented in this section are used as the basis for the detailed Emergency Response Plan procedures which define the specific actions to be taken for each emergency class. Emergency measures begin with the recognition and declaration of an emergency class, notification of the applicable agencies for that emergency class, and mobilization of the appropriate portions of the emergency organization. Subsequent measures include damage assessment, corrective actions, protective actions, and aid to affected personnel. Recovery operations are discussed in Section 5.7, "Recovery."

5.4.1 Activation of Emergency Response Organizations

1. General

   The Plant Operating Manual contains Emergency Operating Procedures (EOPs) and Abnormal Operating Procedures (AOPs). These are intended to aid the plant operators in responding to an accident. The EOPs and AOPs identify actions which should be accomplished to safely terminate the accident and manual actions which should be taken to verify that automatic actions have produced the desired results. The volume of Emergency Operating Procedures also provides, for the operator's use, guidelines which alert the operators to conditions where inadequate cooling of the core exists or where radioactivity releases may occur. Accordingly, if it should appear that any of the Emergency Action Levels are exceeded, as described in EPCLA-01, "Emergency Control," the operators are instructed to activate the Emergency Plan.

5.4.1.1 (Continued)

The Shift Supervisor/Superintendent Shift Operations activates the Plan, assumes the Site Emergency Coordinator's responsibilities, initially classifies the emergency, and ensures that the required notifications are made. The Site Emergency Coordinator will activate portions of, or the entire emergency organization, as warranted for the emergency situation. A more detailed discussion of the methodology that is used in activating the emergency organizations during each class of emergency is provided below and in the Emergency Procedures. Additional detail of the communications networks to be used for notification requirements, for information reporting, and for decision-making with respect to taking protective action onsite and for the general public is contained in EPNOT-01, "CR/EOF Emergency Communicator".

2. Unusual Event

The Shift Supervisor/Superintendent Shift Operations, when informed of conditions which may be an Unusual Event, confirms that an Emergency Action Level has been exceeded and implements EPCLA-01, "Emergency Control." He/she then is responsible for immediately assuming the role of the Site Emergency Coordinator and for notifying and activating those portions of the emergency organization as appropriate to the emergency class which then exists. The Site Emergency Coordinator can augment the onsite shift personnel by activating one or more emergency teams described in Section 5.3.2, "On-site Emergency Response Organization." Typical of the teams that may be notified are the Damage Control Teams, the Fire Brigade.

5.4.1 (Continued)

3. Alert

Section 5.2, "Emergency Classifications" and EPCLA-01, "Emergency Control," describe the types of emergencies that are classified as an Alert. Since the conditions in this emergency class indicate an actual or potential substantial degradation of the level of safety of the plant, and could culminate with the potential of limited releases of radioactive material to the environment, offsite groups will be activated to standby status so that if the emergency level is escalated, the essential offsite emergency organizational groups can be notified and readily mobilized to augment the onsite emergency groups.

At the onset of the Alert, the Shift Supervisor/Superintendent Shift Operations assumes the role of the Site Emergency Coordinator until relieved by a designated, trained plant staff member such as the Plant General Manager or alternates.

The Site Emergency Coordinator implements EPCLA-01, "Emergency Control," and promptly determines the need to activate the rest of the Emergency Response Organization (ERO).

The Site Emergency Coordinator normally initiates the activation of the Technical Support Center, the Operational Support Center, the Emergency Operations Facility, and the Joint Information Center. State and local agencies are notified of the Alert condition. The HBRSEP Damage Control teams will be activated upon activation of the OSC. The Joint Information Center will be activated for the purpose of providing information to the public.

The appropriate County and State emergency group leaders will be requested to remain in a readiness condition in case additional augmentation of support personnel is needed and alerting the population-at-risk is warranted.

5.4.1.3 (Continued)

A decision to go beyond the initial response associated with an Alert class would be based on further degradation of plant parameters, operational experience, or release of radioactive materials that are projected to escalate beyond the Emergency Action Levels for an Alert.

4. Site Area Emergency

Section 5.2, "Emergency Classifications" and EPCLA-01, "Emergency Control," describe the types of emergencies classified as a Site Area Emergency. The Site Emergency Coordinator, when classifying the emergency, takes appropriate predefined steps to correct the situation as described in EPCLA-01, "Emergency Control."

If not done so earlier, the Shift Supervisor/Superintendent Shift Operations assumes the role of the Site Emergency Coordinator until formally relieved. This individual activates the necessary emergency organizations as indicated in Table 5.3.5-1, "Notification and Activation of Principal Emergency Response Organizations" and directs that the essential emergency personnel be notified.

If they have not been previously requested to do so, the offsite groups will be mobilized as soon as possible; and the Emergency Operations Facility (EOF) will be activated. Radiation monitoring teams will be augmented to permit an expanded onsite and offsite monitoring program.

If the plant parameters indicate further degradation of plant safety or projected radiation levels which exceed the recommended values, the emergency will be escalated to the General Emergency.

5.4.1 (Continued)

5. General Emergency

Section 5.2, "Emergency Classifications" and EPCLA-01, "Emergency Control", describe the types of emergencies classified as a General Emergency. The Site Emergency Coordinator upon classifying the situation as a General Emergency takes appropriate, predefined steps to respond to and correct the situation as described in EPCLA-01, "Emergency Control." This includes arranging for personnel to be available, both onsite and offsite, to perform actions up to and including evacuation of the affected sectors of the 10-mile EPZ.

If not done so earlier, the Shift Supervisor/Superintendent Shift Operations immediately assumes the role of the Site Emergency Coordinator until formally relieved. The SEC activates the necessary emergency organizations, as indicated in Table 5.3.5-1, "Notification and Activation of Principal Emergency Response Organizations" and directs that the essential emergency personnel be notified.

The activation and notification process should have begun well before a General Emergency is declared. If the event has not been previously classed as a Site Area Emergency, it may be recommended that the process of warning and notifying the population-at-risk in the plume exposure Emergency Planning Zone commence immediately (so that notification should be complete before a major release occurs). In addition, an initial protective action recommendation will be made for sheltering and/or evacuation based upon the criteria established in EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions For Nuclear Incidents," U.S. Environmental Protection Agency, Washington, D.C., May 1992.

5.4.2 Accident Assessment Actions

1. General

Effective coordination and direction of all elements of the emergency organization require continuing accident assessment throughout an emergency situation. The process of accident assessment involves several different types of activities, in-plant and offsite, depending on the nature and severity of the emergency.

The magnitude of releases of radioactive material can be determined from effluent and process monitors, meteorological data and other sources of information. Additionally, an independent confirmation of the magnitude of the release can be obtained based on the measured dose rates in the environment. Given these measured releases or environmental levels and estimates of the amount of dispersion between the plant and the various points of interest, projected doses can be estimated. These doses can then be related to Protective Action Guides. The various steps in this process are discussed in the following sections and in the Emergency Procedures.

2. Source Term Assessment

a. Effluent and Radiation Readings

The most direct indication of a radiological emergency is a high reading in the effluent radiation monitors. The Radiation Monitoring System (RMS) monitors the airborne gaseous and particulate activity in the reactor containment structures. Additional channels of the Radiation Monitoring System also monitor the gaseous activity in the condenser vacuum pumps, Fuel Handling Building ventilation, and main plant vents. These channels indicate, record, and alarm in the main control room. The RMS gives early warning of a plant malfunction and warns plant personnel of increasing radiation activity which might result in a radiation health hazard. See EPTSC-07, "Damage Assessment," for procedures that discuss core damage assessment which could be used to help identify the source term for dose projection.

5.4.2.2.a (Continued)

These monitors are also the primary means of determining that an emergency exists for accidents involving spills or leaks of contaminated liquids or gases from tanks housing radioactive materials. Such leaks could lead to a release to the environment. In such instances, the following types of emergency actions would take place:

1. The Shift Supervisor/Superintendent Shift Operations on duty would be promptly notified.
2. Personnel from the affected plant area would be evacuated, if required.
3. Access to the plant area involved would be restricted.
4. All plant personnel directly involved would be monitored for contamination.
5. A determination would be made of the potential for an offsite release.
6. The Emergency Procedures would be activated if conditions so indicate.

b. Potential Consequences Based on In-Plant Conditions

When a General Emergency has been declared, the potential consequences require that immediate protective action recommendations be based on core status and containment status. This method does <u>not</u> require that dose projections be made for immediate notification considerations. The initial offsite protective action recommendation based on core and containment status requires, as a minimum, an evacuation for a two mile radius and for affected downwind sectors out to five miles with sheltering to be recommended for all remaining sectors. A flow chart for determining which Sectors to shelter or evacuate is provided as Figure 5.4.4-2, "Initial Protective Action Recommendations" and given in EPCLA-01, Emergency Control."

5.4.2.2.b (Continued)

As assessment of the General Emergency continues, core and containment status, as well as dose projections, will be used to determine follow up protective action recommendations to offsite agencies. Further evaluations of dose assessments against the protective action guidelines will be conducted to determine additional sectors to evacuate. The criteria for these determinations reflects the methodology established in EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," U.S. Environmental Protection Agency, Washington, D.C., May 1992, stipulating a recommendation for evacuation of a sector if the total effective dose equivalent (TEDE) dose is 1 rem or greater or the committed dose equivalent (CDE) to the thyroid is 5 rem or greater.

c. Post-Accident Sampling and Analysis of Reactor and Containment

To aid in the assessment of core damage, capabilities have been provided to permit sampling for chemical and radioanalysis under a wide range of accident conditions. The collection and analysis of samples can be performed without incurring radiation exposures to any individual in excess of 10CFR20.1201, the Occupational Limits for Adults.

During situations involving gross damage to the core, where access to the sampling stations and handling of samples may be limited due to high radiation levels, procedures have been developed to minimize the time required to obtain samples and to reduce the radiation levels during transport and analysis of samples. (See EPRAD-02, "Processing Very High Level Radioactive Samples").

5.4.2 (Continued)

3. Dose Projection and Meteorological Systems

Once the source term is estimated, exposures to onsite and offsite individuals can be estimated as described in EPRAD-03, "Dose Projections." Prior to receipt of information from the emergency radiation monitoring teams, exposure rates at various locations onsite and offsite will be estimated from the airborne concentrations of radioactive material as calculated from plant radiation monitors and the atmospheric dispersion characteristics.

Meteorological measurements, specifically the change in temperature with height, wind velocity, and wind direction, are used to determine the atmospheric dispersion conditions. Necessary information is available through the Emergency Response Facility Information System (ERFIS). Rapid evaluation of potential radiation levels of any downwind area can be made through the use of ERFIS or Personal Computer (PC) Systems.

The H. B. Robinson Steam Electric Plant, Unit No. 2 has an onsite meteorological station with a backup source of additional meteorological data to provide sufficient information for utilization in a dose assessment capability. This system is further described in Section 5.5.7.2, "Meteorological Instrumentation and Procedures."

Currently, the plant staff has an automated dose projection capability as described in EPRAD-03, "Dose Projections."

5.4.2.3 (Continued)

By entering critical plant data and meteorological information obtained from the onsite meteorological station, dose projections can be made for various locations using the plant computer systems. This function has been designed and implemented to allow for the rapid determination of dose isopleths for immediate use by plant personnel.

The Emergency Response Facility Information Systems (ERFIS) computer system provides for monitoring of plant parameters, and meteorological data display is a part of the system for remote interrogation, thus satisfying NUREG-0654, Rev. 1 criteria for meteorological evaluation and remote interrogation.

When measurements of radiation levels offsite are reported by the emergency environmental monitoring teams, the initially projected doses will be confirmed or modified. The information can be used by the Site Emergency Coordinator and his/her staff (or the Emergency Response Manager and his/her staff after the EOF is activated) in responding to the emergency.

4. Emergency Environmental Monitoring

The Site Emergency Coordinator/Emergency Response Manager is responsible for quickly evaluating meteorological conditions existing at the time of the incident and, where releases are or soon will be occurring, for dispatching monitoring teams to specified, predetermined downwind locations. The prime objective of the initial emergency offsite monitoring is to confirm or modify the initial projections of the consequences of any release of radioactive material into the environment as described in EPRAD-01, "Environmental Monitoring."

The Environmental Monitoring Teams collect samples and survey data and transmit information to and/or receive instructions from the Radiological Control Manager who uses this information for determining protective actions.

Calculational aids, site maps, and actual radiation survey data collected by offsite survey teams define affected areas and assess the extent and significance of the release.

5.4.2.4 (Continued)

Information is required for decision making with as little delay as possible; therefore, the initial environmental surveys involve simple-to-perform measurements so that the dose assessments based on plant parameters can be quickly confirmed or modified.

Subsequent environmental monitoring efforts will be aimed at further defining the offsite consequences including estimates of total population exposure and instituting an expanded program to enable prompt assessments of any subsequent releases from the plant. The agencies identified in Section 5.3.4, "Coordination with Participating Governmental Agencies" that are to assist in this expanded radiological monitoring effort will coordinate their efforts with those of the Progress Energy Environmental Monitoring Team.

Field monitoring equipment will have at least the capability to detect and measure radioiodine in the vicinity of the plant site as low as 1×10^{-7} $\mu Ci/cm^3$. The collected air sample can easily be measured by hand held survey meters, a simple test that can serve as an initial check of projected releases based on plant data and can confirm that significant quantities of elemental iodine have been released (the chemical form that would pose a health hazard) **{RNP RA/01-0164}.** More detailed measurements (e.g., Sodium Iodide scintillation counters) can be quickly brought into service to provide the longer term higher capabilities to detect and measure very low levels of contamination in the environment, as would be planned for subsequent radiation monitoring efforts.

At least two environmental monitoring teams will initially be activated from the plant staff upon activation of the EOF, if conditions warrant. Additional teams from other Progress Energy sites will be available for plant support.

5.4.2 (Continued)

5. Emergency Response Data System (ERDS)

The Emergency Response Data System will supply the NRC with selected ERFIS data points on a near real time basis. This function will be activated by the Control Room Staff within an hour of the declaration of an Alert or higher. The selected data points are transmitted via modem to the NRC at approximately 1 minute intervals.

If the primary ERFIS system fails (failover) the backup ERFIS system will reestablish the ERDS link automatically through the communication port for ERDS.

5.4.3 Corrective Actions

Corrective actions that may be taken to mitigate the circumstances of various levels and types of emergencies identified in this plan are given in the plant Emergency Operating Procedures (EOP's). A list of subjects addressed by the EOP Network is tabulated in Table 5.4.3-1, "List of Procedures at HBRSEP for Off-Normal Conditions." In addition, there are fire protection procedures that delineate fire prevention measures and fire detection and suppression systems.

There is also a Security Plan and its associated implementation procedures which provide protection against successful acts of industrial sabotage. Generally, corrective actions include any actions that are taken to repair damaged equipment, to install emergency structures, systems, and components, or to reduce the releases of radioactivity.

In order to maintain proficiency in implementing the various procedures and plans, there are training and retraining programs which in some cases are augmented by periodic drills and exercises. A description of this specialized training is given in Section 5.6.1.1, "Training."

5.4.3 (Continued)

1. Severe Accident Management

Personnel in the SAM organization are generally organized into three categories. First, the decision makers, are those who will approve strategy and actions recommended by the evaluators and authorize instructions given to the implementers. The Site Emergency Coordinator and Emergency Response Manager will fill this role. Second, the evaluators, are those who will determine the appropriate strategy, action and procedure to implement. The Accident Assessment Team, Plant Operations Director, and Technical Analysis Director will fill this role. Third, the implementers, are those who will carry out the actions recommended by the evaluators and approved by the decision makers. The Control Room Operators and Operational Support Center Damage Control Teams will fill this role. The Technical Analysis Manager is not included in the above categories but is provided high level overview training to assist the ERM.

The SAM procedures are composed of a set of diagnostics flow charts, procedures, setpoints and calculational aids which are separate from the Emergency Plan Procedures. SAM entry points are defined and indicate when the Emergency Operating Procedure (EOP) Network has been ineffective in mitigating the accident. Once the SAM program is entered, the TSC will transition from the role of Control Room advisor to directing accident response.

SAM training and table tops/exercises will be conducted in accordance with SAM Program Procedures. While some aspects of the SAM Program may be discussed, these will not be objectives during regular Emergency Plan exercises. The SAM table top/exercise program will be evaluated separately. This is, in part, due to the differing strategies and philosophy associated with severe accident management.

5.4.4 Protective Actions

Protective Actions must take into consideration the potential risks of implementing such measures versus the reduction of the radiological risk achieved by their use. Analyses of the spectrum of emergencies show that only those in the General Emergency class are expected to have consequences in excess of one Rem TEDE, but events in this category generally progress so slowly that some hours are available to alert and take measures to protect the public.

5.4.4 (Continued)

Protective Action Guides for external and internal exposures to airborne radioactive material in the early phase are described in EPCLA-01, "Emergency Control." Protective actions planned for onsite personnel are described in Section 5.4.4.2, "Protective Action - Onsite." Protective actions for the offsite population-at-risk are the responsibility of state and local agencies; however, representative actions at various dose levels are described in Section 5.4.4.6, "Public Warning and Notification" and Section 5.4.4.7, "Protective Actions - Offsite/Public." The evaluation of protective action guides for intermediate phase and ingestion pathways are the responsibility of the State.

1. Criteria for Requesting Outside Assistance

   Notification of offsite agencies will take place when EALs are exceeded (see Section 5.3.5, "Notification and Activation") for situations where major releases are occurring, or will soon occur, it will be recommended that the process of public notification begin. Any incident that is projected to result in radiation doses to the general public in excess of the Protective Action Guides listed in EPCLA-01, "Emergency Control," requires the Site Emergency Coordinator to declare a General Emergency and request assistance from various outside agencies in taking protective measures on behalf of the public.

2. Protective Action - Onsite

   a. Warning and Notification

      The onsite Public Address (PA) system, appropriate alarms, and as appropriate the ERO Beepers will be used to alert/warn and notify onsite personnel of an emergency and necessary protective actions as described in EPCLA-01, "Emergency Control." Such warning and notification will include persons at the Visitors Center and the Recreation Area. Outside the plant protected area, warning will be accomplished as described in Section 5.4.4.6, "Public Warning and Notification" for the public.

5.4.4.2 (Continued)

b. Evacuation & Personnel Accountability

For emergencies requiring protective actions in accordance with Emergency Procedure EPSPA-01, "Evacuation and Accountability"; EPSPA-03, "Administration of Potassium Iodide"; and EPSPA-04, "Access Control", personnel will proceed by the safest, most direct routes to the assembly location as directed by the Site Emergency Coordinator.

- Onshift operating personnel will assemble with the Shift Supervisor/Superintendent Shift Operations.

- All in-plant personnel and visitors not specifically involved in responding to the emergency will assemble in the East parking lot / Building 110 or West parking lot / Unit 2 Administrative Building Cafeteria unless otherwise directed.

A personnel accountability, for persons in the protected area will be carried out within 30 minutes from declaration of a SITE AREA EMERGENCY (SAE), or GENERAL EMERGENCY (If no SAE has been declared). A personnel accountability will occur at the assembly locations in accordance with EPSPA-01, "Evacuation and Accountability," and all personnel will return dosimeters and be checked for radioactive contamination. Contaminated and/or injured individuals will be directed to an area set aside for decontamination and/or medical aid as described in EPSPA-02, "First Aid and Medical Care"; and EPRAD-04, "Personnel Decontamination."

Search for missing persons and rescue will be performed as described in EPSPA-01, "Evacuation and Accountability."

Onsite personnel will evacuate the area when directed using transportation as appropriate. Personnel without transportation will be identified during the assembly phase and provided transportation.

5.4.4.2.b (Continued)

The west access road and the east access road will be used as appropriate to depart from the site. An alternate route through the Darlington County Plant will be used as appropriate. Evacuation from the 10-mile EPZ will be by way of appropriate evacuation routes identified in Figures 5.1.1-2, "10-Mile Plume Exposure EPZ" and the annual Progress Energy Safety Information.

3. Control of Personnel Radiation Exposures

Although an emergency situation transcends the normal requirements for limiting exposures to ionizing radiation, guideline levels are established in EPOSC-04, "Emergency Work Control," for exposures that may be acceptable in emergencies. The maximum TEDE received by any worker should not exceed established regulatory limits (see 5.4.4.3.a, "Lifesaving Actions"). Every reasonable effort will be used to ensure that an emergency is handled in such a manner that no worker exceeds these limits. This also includes the following personnel: assessment groups, first aid, personnel decontamination, ambulance service, and medical personnel.

The administration of radioprotective drugs to Progress Energy personnel and contractor employees may also be useful in mitigating the consequences of inhalation of radioactive materials during an emergency.

Procedures for the administration of radioprotective drugs to Progress Energy and contractor employees are described in EPSPA-03, "Administration of Potassium Iodide."

Decision-making is based on conditions at the time of an emergency and should always consider the probable effects of an exposure prior to allowing any individual to be exposed to radiation levels exceeding the established occupational limits. The probable high radiation acute exposure effects are:

- Up to 50 Rem in 1 day - no physiological changes are likely to be observed.

5.4.4.3 (Continued)

- 50 to 100 Rem in 1 day - no impairment likely but some physiological changes, including possible temporary blood changes, may occur. Medical observations would be required after exposure.

- 100 to 300 Rem in 1 day - some physical impairment possible. Some lethal exposures possible.

The following subsections describe the criteria to be considered for life-saving and facility protection actions.

a. Lifesaving Actions

In emergency situations that require personnel to search for and remove injured persons or entry to prevent conditions that would probably injure numbers of people, a planned dose shall not exceed limits as outlined below:

Dose Limit Rem TEDE[1]	Activity	Condition
5	All	
10	Protecting valuable property	Lower dose not practicable
25	Lifesaving or protection of large populations	Lower dose not practicable
>25	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

[1]Doses to the lens of the eye should be limited to three times the stated TEDE value and doses to any other organ (including skin and body extremities) should be limited to ten times the stated TEDE value.

5.4.4.3.a (Continued)

The following additional criteria should be considered:

1. Rescue personnel should be volunteers or professional rescue personnel (e.g., fire fighters or first-aid and rescue personnel who volunteer by choice of employment.)

2. Rescue personnel should be broadly familiar with the probable consequence of exposure.

3. Women capable of reproduction should not take part in these actions.

4. Other things being equal, volunteers above the age of 45 should be selected whenever possible for the purpose of avoiding unnecessary genetic effects.

5. Internal exposure should be minimized by the use of the most appropriate respiratory protection, and contamination should be controlled by the use of protective clothing when practical.

6. Exposures under these conditions shall be limited to once in a lifetime.

7. Persons receiving exposures as indicated above should avoid procreation for a period up to a few months.

8. Entry into high radiation areas shall not be permitted unless instrumentation capable of reading radiation levels of up to 1,000 Rem/hour (gamma) is provided.

9. Each emergency worker entering a high radiation area shall wear direct reading dosimetry capable of measuring the expected exposure to be received.

5.4.4.3 (Continued)

b. Exposures During Repair/Re-entry Efforts

There may be situations where saving of life is not at issue but where it is necessary to enter a hazardous area to protect valuable installations or to make the facility more secure against events which could lead to radioactivity releases (e.g., entry of damage repair parties who are to repair valve leaks or add iodine fixing chemicals to spilled liquids). In such instances, planned dose to emergency workers should not exceed limits as outlined below:

Dose Limit Rem TEDE[1]	Activity	Condition
5	All	
10	Protecting valuable property	Lower dose not practicable
25	Lifesaving or protection of large populations	Lower dose not practicable
>25	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

[1]Doses to the lens of the eye should be limited to three times the stated TEDE value and doses to any other organ (including skin and body extremities) should be limited to ten times the stated TEDE value.

The following additional criteria should also be considered:

1. Persons performing the planned actions should be volunteers broadly familiar with exposure consequences.

2. Women capable of reproduction should not take part in these actions.

3. Internal exposures should be minimized by respiratory protection and contamination controlled by the use of protective clothing.

5.4.4.3.b (Continued)

4. If the retrospective dose from these actions is a substantial fraction of the prospective limits, the actions shall be limited to once in a lifetime.

5. Entry into high radiation areas shall not be permitted unless instrumentation capable of reading radiation levels of up to 1,000 Rem/hour (gamma) is provided.

6. Each emergency worker entering a high radiation area shall wear direct reading dosimetry capable of measuring the expected exposure to be received.

Emergency teams that must enter areas where they might be expected to receive higher than normal doses will be fully briefed regarding their duties and actions and what they are to do while in the area. They will also be fully briefed as to expected dose rates, stay time, and other hazards. All such entries will include one member from the Plant Monitoring Team, or other person adequately trained in health physics. All team members will use protective devices as specified by the Radiological Control Director. The team members will be instructed not to deviate from the planned route unless required by unanticipated conditions, such as rescue or performance of an operation that would minimize the emergency condition. If the monitored dose rates or stay times encountered during the entry exceed the limits set for the operation, the team will immediately communicate with the OSC Leader or will return to the area from where they were dispatched.

Once their operation has been completed, the team personnel will follow established monitoring and personnel decontamination procedures as specified by the Radiological Control Director.

4. Radioactive Contamination

Reasonable limits and actions will be the basis for determining release of personnel and equipment. The term reasonable is based on mitigation of the accident and protecting the health and safety of the public.

5.4.4.4 (Continued)

a. Onsite Personnel

Radiation safety controls are established to contain the spread of loose surface radioactive contamination. Personnel leaving the contaminated areas are monitored (as per Health Physics Procedure PLP-031, "Contamination Monitoring of Personnel/Personal Effects") to ensure that they or their clothing are not radioactively contaminated. Additionally, in the event of a site evacuation, personnel will be monitored prior to leaving the site or sent to alternate monitoring sites on an as needed basis. If there is a need for decontamination actions outside the plant site, a contingency plan will be developed per EPOSC-03, "Environmental and Radiation Control Team."

Contaminated clothing or personal articles will be decontaminated. Any difficult to remove skin contamination will be removed in accordance with Health Physics Procedure HPS-NGGC-0013, Personnel Contamination Monitoring, Decontamination, and Reporting. Drinking water and food supplies will be monitored and, during an emergency, permitted only in specified clean areas. Contamination on personnel will be removed in accordance with established procedures described in EPRAD-04, "Personnel Decontamination." If normal decontamination procedures do not reduce contamination to acceptable levels, the case will be referred to a competent medical authority.

b. Equipment and Vehicles

Equipment and tools will be released for use outside of the contaminated areas only if loose surface radioactive contamination is within reasonable limits. All tools and items of equipment must be checked for contamination before being taken from a known contaminated area. If the item is found to be contaminated and decontamination is not practical, the item must remain in that area. In the event of a site evacuation, all vehicles will be surveyed for contamination before they are allowed to leave the plant site or sent to alternate monitoring sites as needed. Contaminated vehicles should be decontaminated before being released.

5.4.4 (Continued)

5. Treatment of Injured and Contaminated Persons

Personnel showers and chemical decontamination agents are available on site and, except in cases of serious or life-threatening injury, established decontamination procedures will be employed on site prior to medical treatment. Decontamination showers and supplies are provided adjacent to the radiation control area and in the TSC. Additional personnel decontamination equipment is located in the first aid room. Shower and sink drains in the radiation control area are routed to the miscellaneous waste processing system where the liquid is processed and monitored prior to discharge.

Ambulance service is available through the local rescue squads and emergency medical service. It is anticipated, however, that in cases not involving severe injury, one of the plant vehicles could normally be used to transport individuals to the hospital, especially if radioactive contamination is present. Private automobiles of on-duty personnel could also be used.

Arrangements and facilities for medical treatment of injured plant personnel are described in detail in ATTACHMENT 6.5, "Medical Treatment and Assistance" and in EPSPA-02, "First Aid and Medical Care." Depending on the nature and severity of injury, injured personnel may be treated in-plant by individuals trained in first aid, treated in-plant by a physician, or transported to the hospital for treatment.

In cases of severe injury, lifesaving first aid or medical treatment will take precedence over personnel decontamination. In general, the order of medical treatment will be:

1. Care of severe physical injuries.
2. Personnel decontamination.
3. First aid to other injuries.
4. Definitive medical treatment and subsequent therapy as required.

5.4.4.5 (Continued)

Definitive medical treatment, therapy, and evaluation may include radioprotective drugs, urinary bioassays or whole body counts on persons suspected of inhaling or ingesting a significant amount of radioactive material or may include surveillance and therapy for persons receiving a large whole body dose.

6. Public Warning and Notification

In the event of an emergency, the plant will notify designated County, State and Federal officials in accordance with procedures EPCLA-01, "Emergency Control", EPNOT-00, "Notification and Emergency Communications."

During an ALERT, the appropriate county and state emergency agencies will be notified of conditions and alert the population at risk if needed. Upon declaration of a SITE AREA EMERGENCY the plant will predict plant trends for public officials use. The plant will recommend protective actions for the public upon declaration of a General Emergency.

Public warning when deemed necessary will be accomplished as described by the "South Carolina Operational Radiological Emergency Response Plan." Warning will be given by such methods as sirens supplemented by radio, television, sound trucks, bullhorns, and knocking on doors. Aircraft and patrol boats will be used in notifying people in wooded areas and on Lake Robinson where appropriate and necessary.

Civil defense sirens mounted on 50-foot utility poles have been installed by Progress Energy at 45 locations within a 10-mile radius of the HBRSEP. Since the average ambient noise level throughout the EPZ is about 49dBA, the siren system is planned to provide a 59dBA minimum signal. The siren system may be activated and monitored by a Motorola Feedback system. This system provides for activation, by county, from designated locations within the respective county. By explicit direction from responsible county authorities, the central console in the HBRSEP EOF may also be used to initiate any part of the siren system. The warning signal will be a 3-to-5 minute steady tone on the sirens. The warning system will be reviewed annually and upgraded when conditions warrant.

5.4.4.6 (Continued)

Activation of the sirens will be accomplished by County personnel. The sirens in each county are independently controlled by radio.

The population at risk in the 10-mile Emergency Planning Zone (EPZ) is subdivided into three general categories: resident (permanent) population, transient population, and special facility population as described in "Evacuation Time Estimates for the H. B. Robinson Steam Electric Plant Plume Exposure Pathway Emergency Planning Zone" June 1987, prepared by CP&L & HMM Associates. The total resident population within the 10-mile EPZ is approximately 32,550. Notification time will be less than 15 minutes for all people within 5 miles and less than 45 minutes for those people between 5 and 10 miles. Evacuation routes and times for specific evacuation zones are given in Tables 5.4.4-3, "Evacuation Routes for the 10 Mile EPZ" and 5.4.4-4, "Evacuation Time Summary", respectively. These are consistent with the information presented in the South Carolina Operational Radiological Emergency Response Plan, Part 2 -H. B. Robinson FNF Site Specific, October 1997.

7. Protective Actions - Offsite/Public

a. Public Education and Information

Occupants in the plume exposure pathway Emergency Planning Zone (EPZ) will be provided information prepared by Progress Energy in conjunction with the state and county agencies. This public education and information program is intended to ensure that members of the public are: (a) aware of the potential for an occurrence of a radiological emergency;
(b) able to recognize a radiological emergency notification; and (c) knowledgeable of the proper, immediate actions to be taken upon notification. EPPRO-01, "Program and Responsibilities" addresses this area.

This will be accomplished by: (1) distribution of the annual Progress Energy safety information which contains educational information on emergency preparedness, sheltering, sirens, and radiation including telephone numbers of agencies to contact for more information; (2) availability of qualified personnel to address civic, religious, social, and occupational organizations; and (3) distribution of news material to the media and numerous community and business newsletters.

Emergency information will be made available to transient populations through the distribution of Progress Energy safety information to commercial establishments in the 10-mile EPZ (e.g., brochures, telephone book inserts, etc.)

During an actual emergency, provisions will be established through the Joint Information Center and the Corporate Communications Department to make available and distribute information to the news media. The JIC will implement provisions for a number of telephones which members of the public, who hear rumors, can call for factual information.

The public education and information program is further described in Section 5.6.1.4, "Public Education" and in the "South Carolina Operational Radiological Emergency Response Plan."

b. General

For emergencies requiring protective actions for the general public in designated offsite areas, state agencies will determine the advisability of any necessary evacuation or sheltering. Local agencies will conduct the protective actions as warranted. Assembly points would vary depending on the severity of the incident and on the prevailing weather conditions. To assist in this effort, Progress Energy will provide up-to-date assessments of the condition of the plant and of the quantity and rate of release of radioactivity. Progress Energy will also assist by performing dose assessments which can be compared to pre-planned protective action thresholds.

5.4.4.7.b (Continued)

The protective actions that Progress Energy recommends to the state will be based upon in-plant conditions as well as current meteorological data such as Wind Direction, Speed and Stability Class, and other factors. A flow chart for determining which Sectors to shelter or evacuate is provided as Figure 5.4.4-2, "Initial Protective Action Recommendations" and given in EPCLA-01, "Emergency Control."

Releases affecting offsite areas may not be of the magnitude requiring evacuation, but other public protection measures may be taken at the discretion of the appropriate agencies. These measures may include radio broadcasts warning people to avoid designated areas, to remain indoors, close windows, and avoid consuming uncovered food or drink.

Detailed procedures for public protective action are contained in the "South Carolina Operational Radiological Emergency Response Plan."

c. Evacuation

In the event that evacuation of the 10-mile EPZ is required, the evacuation routes shown in Figure 5.1.1-2, "10 Mile Plume Exposure EPZ" and Table 5.4.4-3, "Evacuation Routes for the 10 Mile EPZ" will be used by onsite and offsite personnel.

The time required to evacuate personnel from the 10-mile EPZ varies depending on whether a part of the EPZ is to be evacuated or all of it, on the time of year such as winter or summer, etc. as illustrated in Table 5.4.4-4, "Evacuation Time Summary" and on other factors as shown in Table 5.4.4-1, "Factors Related to Warning/Evacuation Time."

It should be noted that the evacuation process in itself will produce casualties. Casualties resulting from evacuation based on EPA report EPA-400-R-92-001 Appendix C, Risk of Evacuation are:

Deaths - 9.0 x 10-8 per person mile

5.4.4.7 (Continued)

d. Shelter

All sectors that are not recommended to evacuate will be recommended to shelter. The State may consider sheltering of special populations - institutionalized or infirm persons.

e. Respiratory Protection

It is unlikely that effective public respiratory protection can be provided by improvised devices. This problem will be studied and provisions incorporated in this Plan in the event satisfactory systems are found.

TABLE 5.4.3-1
LIST OF PROCEDURES AT HBRSEP FOR OFF-NORMAL CONDITIONS

AOP-001	Malfunction of Reactor Control System
AOP-003	Malfunction of Reactor Makeup Control
AOP-004	Control Room Inaccessibility
AOP-005	Radiation Monitoring System
AOP-006	Turbine Eccentricity/Vibration
AOP-007	Turbine Trip Below P-7
AOP-008	Accidental Release of Liquid Waste
AOP-009	Accidental Gas Release From a WGDT
AOP-010	Main Feedwater/Condensate Malfunction
AOP-012	Partial Loss of Condenser Vacuum or Circulating Water Pump Trip
AOP-013	Fuel Handling Accident
AOP-014	Component Cooling Water System Malfunction
AOP-015	Secondary Load Rejection
AOP-016	Excessive Primary Plant Leakage
AOP-017	Loss of Instrument Air
AOP-018	Reactor Coolant Pump Abnormal Conditions
AOP-019	Malfunction of RCS Pressure Control
AOP-020	Loss of Residual Heat Removal (Shutdown Cooling)
AOP-021	Seismic Disturbances
AOP-022	Loss of Service Water
AOP-024	Loss of Instrument Bus
AOP-025	RTGB Instrument Failure
AOP-026	Low Frequency Operation
AOP-028	ISFSI Abnormal Events
AOP-031	Operation with High Switchyard Voltage
AOP-032	Response to Flooding from the Fire Protection System
AOP-033	Shutdown LOCA
AOP-034	Security Events
AOP-035	S/G Tube Leak
AOP-036	SFP Events

TABLE 5.4.3-1 (Continued)
LIST OF PROCEDURES AT HBRSEP FOR OFF-NORMAL CONDITIONS

PATH-1	PATH-1
PATH-2	PATH-2
EPP-SUPPLEMENTS	
EPP-FOLDOUTS	
EPP-1	Loss of All AC Power
EPP-2	Loss of All AC Power Recovery without SI Required
EPP-3	Loss of All AC Power Recovery with SI Required
EPP-4	Reactor Trip Response
EPP-5	Natural Circulation Cooldown
EPP-6	Natural Circulation Cooldown with Steam Void in Vessel
EPP-7	SI Termination
EPP-8	Post-LOCA Cooldown and Depressurization
EPP-9	Transfer to Cold Leg Recirculation
EPP-10	Transfer to Long Term Recirculation
EPP-11	Faulted Steam Generator Isolation
EPP-12	Post-SGTR Cooldown Using Backfill
EPP-13	Post-SGTR Cooldown Using Blowdown
EPP-14	Post-SGTR Cooldown Using Steam Dump
EPP-15	Loss of Emergency Coolant Recirculation
EPP-16	Uncontrolled Depressurization of all Steam Generators
EPP-17	SGTR with Loss of Reactor Coolant: Subcooled Recovery
EPP-18	SGTR with Loss of Reactor Coolant: Saturated Recovery
EPP-19	SGTR without Pressurizer Pressure Control
EPP-20	LOCA Outside Containment
EPP-21	Energizing Pressurizer Heaters from Emergency Busses
EPP-22	Energizing Plant Equipment using the Dedicated Shutdown Diesel Generator
EPP-23	Restoration of Cooling Water Flow to Reactor Coolant Pumps
EPP-24	Isolation of Leakage in the RHR Pump Pit
EPP-25	Energizing Supplemental Plant Equipment Using the DS DG
EPP-26	Loss of DC Bus "A"
EPP-27	Loss of DC Bus "B"

TABLE 5.4.3-1 (Continued)
LIST OF PROCEDURES AT HBRSEP FOR OFF-NORMAL CONDITIONS

CSFST	Critical Safety Function Status Trees
FRP-S.1	Response to Nuclear Power Generation/ATWS
FRP-S.2	Response to Loss of Core Shutdown
FRP-C.1	Response to Inadequate Core Cooling
FRP-C.2	Response to Degraded Core Cooling
FRP-C.3	Response to Saturated Core Cooling
FRP-H.1	Response to Loss of Secondary Heat Sink
FRP-H.2	Response to Steam Generator Overpressure
FRP-H.3	Response to Steam Generator High Level
FRP-H.4	Response to Loss of Normal Steam Release Capability
FRP-H.5	Response to Steam Generator Low Level
FRP-P.1	Response to Imminent Pressurized Thermal Shock
FRP-P.2	Response to Anticipated Pressurized Thermal Shock
FRP-J.1	Response to High Containment Pressure
FRP-J.2	Response to Containment Flooding
FRP-J.3	Response to High Containment Radiation Level
FRP-I.1	Response to High Pressurizer Level
FRP-I.2	Response to Low Pressurizer Level
FRP-I.3	Response to Voids in Reactor Vessel

TABLE 5.4.4-1
FACTORS RELATED TO WARNING/EVACUATION TIME

1. Facility to Offsite Agencies Alert Phase
   a. Decision-making time
   b. Physical actions/calling time
2. Governmental Agencies to Public Alert Phase
   a. Decision-making time
   b. Physical actions/calling-alerting time
3. Public Alert and Notification Phase
   a. Hear signal
   b. Recognize signal
   c. Seek confirmation of signal meaning and validity
   d. Find confirmation of signal meaning
   e. Relate signal meaning to self
   f. Decide to act.
4. Movement Preparation Phase
   a. Time between deciding to act and departing location
   b. Shutting off utilities
   c. Packing bags
   d. Deciding on destination and routes
   e. Taking care of livestock, etc.
   f. Collecting other family members
   g. Loading the automobile and departing
5. Movement/Travel Phase
   a. Movement time is a function of road distance to the boundary of the evacuation area, vehicle used for evacuation, and auto traffic conditions (traffic volumes, road capacity, weather conditions, etc.).
   b. Road capacity under emergency conditions per FEMA CPG-2-8-C are assumed to be 850 vehicles per hour (vph) per lane; under foul weather conditions 450-500 vph.
   c. Traffic volume is determined by: (1) dividing the EPZ population by the average number of persons per dwelling unit; or (2) obtaining statistical data on number of vehicles registered in the EPZ, or; (3) other.
6. Evacuation Verification Phase
   a. Marker Technique (NRC NUREG-0654)
      Auto check - Total road distances: Ave. 15 mph
      Aircraft check
   b. Telephone poll: 0.5 min. per residence

TABLE 5.4.4-2
REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE(*)

Structure or Location	Shielding Factor(a)	Representative Range
Outside	1.0	--
Vehicles	1.0	--
Wood-frame house(b) (no basement)	0.9	--
Basement of wood house	0.6	0.1 to 0.7(c)
Masonry house (no basement)	0.6	0.4 to 0.7(c)
Basement of masonry house	0.4	0.1 to 0.5(c)
Large office or industrial building	0.2	0.1 to 0.3(c,d)

(a) The ratio of the dose received inside the structure to the dose that would be received outside the structure.

(b) A wood frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.

(c) -This range is mainly due to different wall materials and different geometries.
-The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

(d) Shielding Factor = Shielded Dose Rate/Unshielded Dose Rate

*From: SAND 77-1725, "Public Protection Strategies For Potential Nuclear Reactor Accidents," Sandia Laboratory

TABLE 5.4.4-3
EVACUATION ROUTES FOR THE 10 MILE EPZ
(Effective 12/01/2002)

COUNTY	SECTOR	ROUTE	EVACUATION ROUTE	EVACUATION SHELTER
Darlington	**A-0**	#1	Rancho Rd., Substation Rd., Clyde Rd., Westover Drive, Old Camden Rd., New Market Rd., Whippoorwill Rd. - All to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South to I-95 South to Exit 160 to shelter in Florence County	Florence City-County Civic Center 3300 West Radio Drive Florence, SC 29501 Located off David McLeod Blvd approximately 1 mile east of I-95 and I-20
Chesterfield	**A-1**	#2	S13-763 (Prospect Church Road) to S13-29 (Ruby-Hartsville Road) to SC-145 to Chesterfield.	Chesterfield Senior High School, 401 N. Page St. Route 1, Box 2 Chesterfield, SC Located off Hwy. 145 North of Chesterfield 0.5 mile on the left.
Chesterfield	**A-2**	#3	S13-149 (Cedar Creek Church Road) to SC-102 to SC-145 to Chesterfield, **OR**, S13-491 (Bullard Ford Road) to S13-29 (Ruby-Hartsville Road) to SC-145 to Chesterfield.	Chesterfield Senior High School (see address above)
Darlington	**B-1**	#4	14th St., W. Home Ave., W. Carolina Ave., S. Fifth St., New Market Rd., Old Camden Rd. - All to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South to I-95 South to Exit 160 to shelter in Florence County.	Florence City-County Civic Center (see address in Sector A-0)
		#5	Lakeview Blvd., Old Camden Rd., Ruby Rd., Ousleydale Rd., N. Fifth St., Miller Ave., Railroad Ave., Coker Ave., Marquis Hwy, Fourth St. - All to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South to I-95 South to Exit 160 to shelter in Florence County.	

TABLE 5.4.4-3 (Continued)
EVACUATION ROUTES FOR THE 10 MILE EPZ
(Effective 12/01/2002)

COUNTY	SECTOR	ROUTE	EVACUATION ROUTE	EVACUATION SHELTER
Darlington	**B-2**	#6	Ousleydale Rd., Old Camden Rd., Patrick Hwy, Antioch Rd., Miller Ave., E. Home Ave., E. Carolina Ave., N. Center Rd., W. Billy Farrow Hwy, Swift Creek Rd., Fourth St. - All to N. Fifth St. and Marquis Hwy to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South to I-95 South to exit 160 to shelter in Florence County.	Florence City-County Civic Center (see address in Sector A-0)
		#7	Old Camden Rd., Rolling Rd., Antioch Rd., N. Center Rd., Bethlehem Rd. - All to US-15; then take Dovesville Hwy to Governor Williams Hwy to US-52 South to I-95 South to exit 160 to shelter in Florence County.	
		#8	E. Home Ave., E. Carolina Ave., Centerville Rd., N. Center Rd. W. Billy Farrow Hwy - All to Floyds Rd.; then take Governor Williams Hwy to US-52 South to I-95 South to exit 160 to shelter in Florence County.	
		#9	Flinn's Cross Rd., Swift Creek Rd., Center Rd., to W. Billy Farrow Hwy; then take Governor Williams Hwy to US-52 South to I-95 South to exit 160 to shelter in Florence County.	
Darlington	**C-1**	#10	Hillcrest Rd., Clyde Rd., Kellytown Rd., Bay Rd., High Point Rd. - All to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South to I-95 South to exit 160 to shelter in Florence County.	Florence City-County Civic Center (see address in Sector A-0)

TABLE 5.4.4-3 (Continued)
EVACUATION ROUTES FOR THE 10 MILE EPZ
(Effective 12/01/2002)

COUNTY	SECTOR	ROUTE	EVACUATION ROUTE	EVACUATION SHELTER
Darlington	C-2	#11	Highway 403 to Windham's Crossroads (401) to I-20 East to shelter.	Florence City-County Civic Center (see address in Sector A-0)
		#12	Highway 403 to Windham's Crossroads (401) to I-20 East to shelter.	
Darlington	D-1	#13	Old Camden Rd., Rainbow View Rd., Family Rd., Clyde School Rd., Ashland Rd., Kelleybridge Rd. - All to Bo Bo Newsome Hwy to Darlington; then take Governor Williams Hwy to US-52 South I-95 South to Exit 160 to shelter in Florence County.	Florence City-County Civic Center (see address in Sector A-0)
Lee	D-2	#14	SC-341 to US-15 through Bishopville to SC-34 Traffic Control Point **OR** SC-34 through Bishopville to Reception Center located on South Lee Street.	Lee Central High School 1800 Wisacky Hwy. Bishopville, SC
Chesterfield	E-1	#15	S13-150 (New Hope Church Rd.) to S13-711 (Sowell Rd.) to SC-151 to US-1 to SC-145 to Chesterfield. **OR**, S13-46 (Middendorf Road) to S13-346 (Lake Robinson Road) to SC-151 to US-1 to SC-145 to Chesterfield. **OR**, SC-151 to US-1 to SC-145 to Chesterfield.	Chesterfield Senior High School (see address in Sector A-1 above)
Chesterfield	E-2	#16	S13-296 (Old Creek Road) to US-1 to SC-145 to Chesterfield. Or, US-1 to SC-145 to Chesterfield.	Chesterfield Senior High School (see address in Sector A-1 above)

TABLE 5.4.4-4
EVACUATION TIME SUMMARY
ONE LOCAL ZONE

Local Planning Zones Evacuated	Total Evacuation Time (Minutes)[1] Winter Weekday, Fair Weather	Winter Weeknight, Fair Weather	Summer Weekday, Fair Weather	Winter Weekday, Adverse Weather[2]
A-0*	170	155	170	180
A-1	155	155	155	160
B-1*	220	170	195	280
C-1*	155	155	155	160
D-1	155	155	155	160
E-1	155	155	155	160
A-2*	155	155	155	160
B-2*	155	155	155	160
C-2*	155	155	155	160
D-2	155	155	155	160
E-2*	155	155	155	160

1. Evacuation time includes public alerting and notification (15 minutes), preparation for movement (15 minutes), and time to travel out of the boundary of the 10-mile EPZ.

2. Sudden rainstorm adverse weather is represented by a reduction in roadway capacities and travel speeds of 25%.

* There are schools located in these Local Planning Zones. Evacuation times for a single Planning Zone will provide a worst case estimate for precautionary evacuation of schools in session.

TABLE 5.4.4-4 (Continued)
EVACUATION TIME SUMMARY
2, 5, 10 Mile Radius

Local Planning Zones Evacuated	Total Evacuation Time (Minutes)[1] Winter Weekday, Fair Weather	Winter Weeknight, Fair Weather	Summer Weekday, Fair Weather	Winter Weekday, Adverse Weather[2]
A-0 (2 mile radius)	170	155	170	180
A-0, A-1, B-1 C-1, D-1, E-1 (5 mile radius)	225	180	210	295
ALL (10 mile radius)	240	180	215	315

1. All residents, transients, and special facilities within the EPZ would be evacuated. Evacuation time estimates include the times associated with public alerting and notification, preparation and mobilization events, as well as actual travel time out of the EPZ (i.e., on-road travel time, including delays associated with vehicle queuing).

2. Sudden rainstorm adverse weather is represented by a reduction in roadway capacities and travel speeds of 25%.

FIGURE 5.4.4-1
EVACUATION ZONES AND ROUTES

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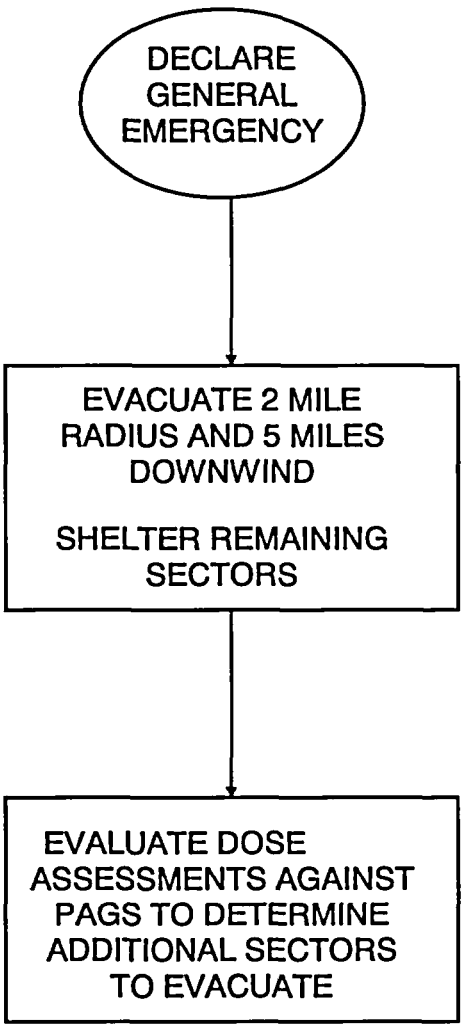
SEE FIGURE 5.1.1-2

FIGURE 5.4.4-2
INITIAL PROTECTIVE ACTION RECOMMENDATIONS



5.5 Emergency Facilities and Equipment

To facilitate efficient and effective control and coordination of the numerous actions required during emergency situations, several facilities have been designated as emergency centers for HBRSEP. These facilities are linked by a comprehensive communications network to allow accurate and timely communications between the facilities, outside agencies, and the public. The communications network uses Bell systems, VoiceNet, Emergency Telecommunication System (ETS), data links, and radio to provide:

- Voice communication through normal telephone (Bell), selective signaling and automatic ringdown (hot line) between selected facilities, conference call capability, speaker phones and assistance where required;

- Radio communications between selected Progress Energy vehicles and appropriate fixed locations, as well as with state mobile units and fixed locations (using SCEMD, Local Government Radio (LGR) network);

- Facsimile. (A detailed discussion of the HBRSEP emergency communications systems is presented as ATTACHMENT 6.1, "Communications Systems"). Data transmission by the Emergency Response Data System (ERDS) is established with the NRC at Alert and higher classifications.

The purpose of emergency response facilities is to provide centralized locations for organized coordination and control of onsite and offsite activities during an emergency. A location is provided from where ERO members may direct the activities for which they are responsible, while providing for coordination of activities with other organizations.

Facilities function as a center for the licensee's command and control functions of onsite operations, including coordination of all licensee activities, onsite and offsite. Also needed is a center for the analysis of plant effluent monitors, meteorological conditions, and offsite radiation measurements, and for offsite dose projections. As discussed in Section 5.3, "Emergency Response Organization", additional facilities are needed where information regarding current and projected plant status needed by federal, state, and local authorities for implementation of offsite emergency plans can be transmitted, where key representatives of the agencies can meet and where the press can operate.

5.5 (Continued)

The above functions are carried out by the interaction of the Control Room, the Operational Support Center, the Technical Support Center, the Emergency Operations Facility, the Corporate Communication Department, Joint Information Center, the State and County Emergency Operating Centers, and the NRC Operations Center. These centers are connected with a comprehensive, redundant communications network.

The functional capabilities of the HBRSEP emergency facilities are presented in Table 5.5.0-1, "Functional Objectives of Emergency Facilities", and the physical locations of on-site emergency facilities are shown on Figure 5.1.1-3, "Emergency Response Facility Locations." Specific information about the facilities and equipment available for dealing with emergencies at HBRSEP is presented in the following sections.*

5.5.1 Control Room

The function of the Control Room is plant control. All plant-related operations are directed from the Control Room. The Control Room is designed to meet habitability standards as described in the HBRSEP UFSAR.

Nuclear plant instrumentation, including area and process radiation monitoring system instrumentation, is provided in the Control Room to give early warning of a potential emergency and provides for a continuing evaluation of the emergency situation. The Control Room contains the controls and instrumentation necessary for operation of the reactor and turbine generator under normal and emergency situations.

Additional equipment such as portable radiation survey instruments, readout of meteorological instrumentation and communication equipment are available in the Control Room. A supply of protective clothing, respiratory equipment, and self-contained breathing apparatus will also be maintained in the Control Room.

* Recovery operations, and the Recovery Center are discussed in Section 5.7, "Recovery".

5.5.2 Technical Support Center

The Technical Support Center (TSC) provides a location to house individuals who are knowledgeable of and responsible for engineering and management support of plant operations during an emergency. Plant design/operation information in the form of drawings, UFSAR, Technical Specifications, visual display of parameters, and local TSC radiation monitors have been placed in the facility. The Technical Support Center is a reinforced concrete building situated on a concrete slab located as shown in Figure 5.1.1-1, "Robinson Site Plan." The TSC is adjacent to the protected area. It was built in accordance with the local building code.

The Technical Support Center has been designed to allow continuous occupancy during an emergency. It is to be supplied electrical service from two separate sources through an automatic transfer switch. Upon loss or degradation of the normal source, the vital building loads will be automatically transferred to the alternate source. One of the power sources is fed from offsite power and the other source is fed from the Primary Access Point Emergency Diesel Generator.

The TSC provides Emergency Response equipment:

1. An Emergency Response Facility Information System (ERFIS) gathers plant data and displays it on CRTs. The ERFIS has the capability of presenting the data in various formats and providing hard copies on demand.

2. Radiation monitors (area and atmosphere) to determine the radiological habitability of the TSC.

3. Charcoal and HEPA Filters to provide personnel habitability during radioactive releases.

In the event of a TSC evacuation, the Control Room will serve as a backup for the TSC.

5.5.3 Operational Support Center

The purpose of the Operational Support Center (OSC) is to minimize congestion in the Control Room during emergencies by providing a location, separate from the Control Room, where Maintenance, Radiation Control technicians, Environmental and Chemistry technicians, additional Operations personnel, and other plant emergency support personnel will assemble and assist as needed. The Operational Support Center is located in the O&M Building on Unit 2.

In the event of an OSC evacuation, the Training Building 410 will serve as the back-up/alternate OSC.

5.5.4 Emergency Operations Facility

The Emergency Operations Facility (EOF), located in the TSC/EOF/Training Building, provides space for management of overall emergency response including coordination with federal, state, and county officials, coordination of offsite radiological and environmental assessment, and determination of recommended public protective actions.

The Emergency Operations Facility (like the TSC) is designed for continuous operation.

In the event that radiological conditions do not allow access to the EOF, the Darlington County Emergency Operations Center in Darlington, SC will serve as a temporary assembly location for EOF personnel.

A Remote Emergency Response Facility has been established away from the plant site. The remote facility will serve as a location for selected members of the Emergency Response Organization to assemble in the event that access to the plant's on site Emergency Response Facilities(EOF/TSC/OSC) is not possible. The remote facility is intended to be staffed short term during the period when the on-site facilities are not accessible and will contain minimal equipment necessary for operation.

5.5.5 Joint Information Center (JIC)

The JIC is tied into the Progress Energy emergency communications network. Work stations are available for Company personnel assisting the media, and a briefing room is available. Provisions have been made for separate telephones and workspace, for use by news media personnel. The Joint Information Center is located in the Southern Division Operations Building, 1755 Mechanicsville Road, Florence, South Carolina.

The JIC is staffed by site communications personnel and other Progress Energy personnel. The JIC is designed to house representatives from county, state and federal agencies. The JIC is located in excess of 10 miles from HBRSEP, therefore no back-up facility has been provided.

5.5.6 Offsite Emergency Facilities

1. Both Harris Nuclear Plant and Brunswick Nuclear Plant have Technical Specialists and equipment available for HBRSEP as needed.

2. Harris Energy & Environmental Center (HE&EC)

   The Harris Energy & Environmental Center operated by Progress Energy near Raleigh provides extensive technical support capabilities. Also located at the facility are a PWR control room simulator, a dosimetry laboratory, a low-level radiological laboratory, a radiochemical laboratory, and a full complement of radiation monitoring equipment associated with the labs.

3. State Emergency Operations Center

   The State Emergency Operations Center, located in Columbia, South Carolina, is established by the Governor of South Carolina and is staffed to support state and local activities. Progress Energy provides, at the request of the Emergency Management Division, liaison personnel to the Center. Progress Energy, Bell, and state communications equipment is provided.

5.5.6 (Continued)

4. County Emergency Operations Centers

A County Emergency Operations Center provides a location where county authorities can direct offsite activities within their jurisdiction. The county facilities for HBRSEP are as follows:

1. Darlington County Emergency Operations Center, EMS/EPA Building - Courthouse Annex, Darlington, South Carolina.

2. Chesterfield County Emergency Operations Center, 109 Scotch Road, Chesterfield, South Carolina.

3. Lee County Emergency Operations Center, 119 DesChamps Street, Bishopville, South Carolina.

5.5.7 Assessment Capabilities

1. General

The instrumentation and control systems 1) monitor, 2) provide indication and recording, and 3) automatically regulate the variables necessary for safe and orderly operation of the plant. These systems provide the operators with the information and controls needed to start up, operate at power, and shut down the plant. They further provide means to cope with all abnormal operating conditions. Plant control and display of information from these various systems are centralized in the Control Room on ERFIS at locations convenient to the operator. This instrumentation, in conjunction with projected off-site doses, provides the basis for initiation of protective actions.

5.5.7 (Continued)

2. Meteorological Instrumentation and Procedures

The H. B. Robinson Steam Electric Plant, Unit No. 2 has a permanent meteorological monitoring station located on site for display and recording of wind speed, wind direction, and temperature differences for use in making off-site dose projections, etc. Meteorological information is presented in the Control Room by means of the plant computer. Meteorological parameters are measured by sensors located on the tower as listed in Table 5.5.7-1, "Onsite Meteorological Instrumentation." In addition, barometric pressure, solar radiation, precipitation and dew point temperature data are recorded at the station. This information is remotely interrogatable using a computer or other data access terminal.

The meteorological sensors used at the Meteorological monitoring station are included in the RNP Preventative Maintenance Program to ensure that required calibrations are performed at least once every 184 days +46 days with a minimum of two calibrations each calendar year. The calibrations consist of the necessary maintenance activities to maintain sensor accuracy within original equipment manufacture specifications. Replacement sensors are obtained with NIST-traceable calibration documentation. Between the scheduled calibrations, a bimonthly station check (site inspection) of the system confirms system operational status. This system verification will be performed at least once between calibrations.

HBRSEP personnel will make periodic visits to the monitoring station to assure that components are functioning as anticipated. Further checks of the data are made by remote interrogation of the monitoring station by contract Meteorological personnel. This data is reviewed by contract meteorological personnel to determine system performance and the acceptability of the reported information. Data will be provided to Progress Energy.

5.5.7.2 (Continued)

The meteorological instrumentation which Progress Energy uses at the meteorological monitoring station, meets the requirements of N.R.C. Regulatory Guide 1.23 (Rev. 0) and provides the meteorological parameters to the locations specified in our December 31, 1984 and July 18, 1985 responses to N.R.C. on Regulatory Guide 1.97 (Rev. 3), Table 1 and Table 3. As specified within Section 8.2 of Supplement Number 1 to NUREG-0737, Progress Energy maintains telephone numbers for voice communications to the nearest National Weather Service, first order observation station (Florence, S.C.) for twenty-four hour per day access to this backup meteorological information should the onsite system fail. This backup source of meteorological data is the closest location which can provide reliable representative meteorological information for HBRSEP.

Should the onsite meteorological data collection system exhibit suspect information, loss of data due to computer or instrument failure, or plant personnel require additional technical assistance, National Weather Service or off site meteorologists are available to provide needed expertise. In the event that the onsite meteorological tower or monitoring instrumentation becomes inoperative and the off site meteorologists cannot be contacted, meteorological data may be obtained from the National Weather Service in Columbia, South Carolina or Wilmington, North Carolina. Available internet sites for weather data are listed in the ERO phone book.

3. Seismic Monitoring

The HBRSEP Seismic Monitoring System senses and records earthquake ground motion. The system is comprised of two (2) strong motion seismic recorders. A computer is used for downloading stored data from the recorders.

5.5.7.3 (Continued)

The recorders measure and record the acceleration of the structure, primarily the concrete floors near the purge valve outside containment and south of the Unit 2 Waste Retention Basin. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, will be recorded at the remote locations. The Seismic Monitoring System remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits.

The recorder senses and permanently records the information defining a response spectrum. It also provides signals for immediate indication on the RTGB that specific preset response accelerations have been exceeded. Table 5.5.7-2, "Seismic Monitoring" shows instrument and sensor locations along with measurement range of HBRSEP seismic monitoring.

A considerable array of seismometers is located in the region. A central point of contact to obtain information about a seismic event is the U. S. Geological Survey in Reston, Virginia.

4. Radiological Monitors

The Radiation Monitoring System (RMS) is available to give early warning of a possible emergency and provides for a continuing evaluation of the emergency situation in the Control Room. Radiation monitoring instruments are located at selected areas within the facility to detect, measure, and record radiation levels. In the event the radiation level should increase above a preset level, an alarm is initiated in the Control Room. Certain radiation monitoring instruments also alarm locally in selected areas of the facility. The radiation monitoring system is divided into three subsystems:

1. Process Radiation Monitoring System (which includes effluent monitors) monitors various fluid streams in operating systems.

5.5.7.4 (Continued)

2. Area Radiation Monitoring System monitors radiation levels at various locations within the operating area. In addition to permanent plant monitors, portable Continuous Air Monitors (CAMs) measure airborne particulate and airborne iodine activities at various locations within the Radiologically Controlled Area. Also, the Environmental Monitoring System monitors airborne activity at various outdoor locations in the restricted area and offsite.

3. Accident Radiation Monitoring System monitors radiation levels at various locations. These are high range instruments to track radiation levels in an accident or post accident conditions.

The types, ranges, and locations of RMS monitors are listed in Table 5.5.7-3, "Radiation Monitoring System." Typical portable radiation monitors are listed in Table 5.5.7-4, "Portable Radiation Survey Instruments." The radiation monitors are designed to permit monitoring of activity releases during a broad spectrum of postulated emergency situations.

The locations of the offsite and onsite environmental monitoring stations, and the location of the emergency TLD monitoring stations are shown on Table 5.5.7-5, "Locations of Environmental Sampling Stations."

5. Process Monitors

Instrumentation used to monitor vital plant parameters is described in Section 7.5 of the HBRSEP UFSAR. This instrumentation is continuously monitored in the Control Room. Essential process monitoring will also be available in the Technical Support Center.

5.5.7 (Continued)

6. Laboratory Facilities

Support of the radiation monitoring and analysis effort is provided by an onsite laboratory. The onsite laboratory includes equipment for chemical analyses and for analysis of radioactivity.

The wet chemistry equipment is used to perform a variety of analyses (pH, conductivity, boron content of reactor coolant, etc.). It is also used to perform radiochemical analyses and preparation of samples to permit analysis of the radioactivity content.

Equipment used to analyze the type and amount of radioactivity in filters, smears, etc., is located adjacent to the chemistry lab. This includes a multichannel analyzer (Ge-Li) used to determine the isotopic content in a sample, a liquid scintillation counter for tritium analyses, and gas proportional counter for gross alpha, and gross beta activity.

Much of this equipment is rack mounted; some is readily portable. Additional facilities for counting and analyses of HBRSEP samples can be provided by laboratory facilities at the Harris Energy and Environmental Center (HE&EC) located near New Hill, North Carolina, and by the Brunswick Plant.

As described in the State of South Carolina Operational Radiological Emergency Response Plan (SCORERP), the SC DHEC Bureau of Land & Waste Management maintains a mobile radiological laboratory and can provide independent analysis.

5.5.7 (Continued)

7. Dose Projection

The magnitude of releases of radioactive material can be determined from effluent and process monitors based on procedures contained in EPRAD-03, "Dose Projections." Additionally, an independent confirmation of the magnitude of a release can be obtained by environmental monitoring as described in EPRAD-01, "Environmental Monitoring." Given a source term, or the magnitude and rate of release to the environment, and meteorological data previously described, the control room may make the initial dose projections and is capable of performing this function on a 24 hour-per-day basis. After activation of the Emergency Operations Facility, the Radiological Control Manager described in Section 5.3, "Emergency Response Organization", is responsible to the Emergency Response Manager for determining initial dose projections from readily available data. EPRAD-03, "Dose Projections," describes a computer program which automates dose projection calculations when used in conjunction with the meteorological systems.

5.5.8 Fire Detection

The Fire Detection System is designed to quickly detect visible or invisible smoke (or other products of combustion) and/or heat in designated areas of the plant.

The Fire Detection System consists primarily of fire detectors, control panel units, and process computer. A fire signal initiated by a detector travels to the respective Fire Detection and actuation Panel (FDAP), then to a Fire Alarm Computer. The control panel unit is located in the same or adjacent building as the detector. The Fire Alarm Computer is located in the Unit 2 Control Room.

The types and number of detectors have been selected in accordance with the combustible materials and electrical equipment present in the area and the physical surroundings of each area. Ionization detectors sense the presence of products of combustion before they are visible in the form of smoke. Thermal detectors are sensitive to both temperature and the rate of rise of increasing temperature.

The Fire Protection Surveillance Tests lists the following information regarding the fire detectors used:

1. Building location.
2. Number of ionization detectors.
3. Number of thermal detectors.

5.5.9 Protective Facilities and Equipment

Complete personnel decontamination facilities are located on the first floor of the Auxiliary Building and in the TSC. Each facility includes a decontamination shower. The First Aid Room contains equipment which may be used for personnel decontamination. Alternate means for decontamination are also available.

The type of emergency kits and their locations are found in RST-003, "Emergency Kit Inventory."

5.5.10 First Aid and Medical Facilities

A first aid room is located in the O&M Building. First aid kits and supplies are also available in the Storeroom.

Offsite medical facilities which have agreed to accept personnel are described in ATTACHMENT 6.5, "Medical Treatment and Assistance."

5.5.11 Damage Control Equipment and Supplies

In the event of an emergency, certain immediate repairs may be necessary to minimize the further release of radioactivity and also ensure the protection of plant equipment. Damage control equipment and supplies that would be used to effect repair would depend on the nature of the repairs to be performed.

Damage control equipment and supplies are located in the tool room and the maintenance shops.

5.5.12 *Offsite Environmental Monitoring Equipment and Supplies*

In the event of an emergency, the plant has the capability to deploy two offsite environmental monitoring teams as described in EPTSC-04, "Radiological Control Director" and EPEOF-02, "Environmental Monitoring Team Leader." Three environmental monitoring kits with the necessary equipment and supplies for offsite radiological monitoring (as per RST-003, "Emergency Kit Inventory") are designated for use in the event of an emergency. Transportation for offsite environmental monitoring teams will be supplied by plant vehicles, such as maintenance, environmental and other Company trucks if available or private autos at the site.

TABLE 5.5.0-1
FUNCTIONAL OBJECTIVES OF EMERGENCY FACILITIES

Facility Name	Location	Functional Objectives
Control Room (CR)	Control Building	1) Plant control. 2) Initial direction of all plant-related operations. 3) Backup location for the Technical Support Center.
State Emergency Operations Center (SEOC)	Columbia, South Carolina	1) Assembly location for Governor and state emergency response officials to perform overall direction and control of plume and ingestion EPZ protection actions in the State of South Carolina. 2) Coordination with federal authorities and the State of North Carolina. 3) Overall direction and control of offsite recovery and re-entry activities. 4) Dissemination of media information.
Technical Support Center (TSC)	TSC/EOF/Training Building (North Side)	1) Assembly location for technical personnel to provide engineering and management support of plant operations following an accident. 2) Direction and coordination of overall plant emergency activities.
Operational Support Center (OSC)	1st Floor O&M Bldg.	1) Reporting place for emergency support personnel. 2) Dispatching location of personnel to support actions as directed by the Site Emergency Coordinator.

TABLE 5.5.0-1 (Continued)
FUNCTIONAL OBJECTIVES OF EMERGENCY FACILITIES

Facility Name	Location	Functional Objectives
Joint Information Center (JIC)	Southern Division Operations Building Florence, SC	1) Provide immediate access to accurate emergency related information generated by all involved agencies to media representatives. 2) Provide equipment for document reproduction, telecopying, communications, and television electrical connections.
Corporate Communications Department (CCD)	Raleigh, NC	1) Support JIC. 2) Distribute background information. 3) Provide information to media representatives. 4) Provide information to Corporate management.
Emergency Operations Facility (EOF)	TSC/EOF/Training Building (South Side)	1) Provide working space and communication links for the Emergency Response Manager and staff. 2) Provide primary interface point for Progress Energy and offsite support personnel (Federal, State, and Local). 3) Provide point of coordination for offsite radiological and environmental assessment.

TABLE 5.5.0-1 (Continued)
FUNCTIONAL OBJECTIVES OF EMERGENCY FACILITIES

Facility Name	Location	Functional Objectives
Chesterfield County Emergency Operations Center (EOC)	Chesterfield, South Carolina 109 Scotch Road	1) Direction and coordination of Chesterfield County emergency and protective response actions.
Darlington County Emergency Operations Center (EOC)	Darlington, South Carolina EMS/EPA Building-Courthouse Annex	1) Direction and coordination of Darlington County emergency and protective response actions.
Lee County Emergency Operations Center (EOC)	Bishopville, South Carolina 119 DesChamps Street	1) Direction and coordination of Lee County emergency and protective response actions.

TABLE 5.5.7-1
ONSITE METEOROLOGICAL INSTRUMENTATION

SENSORS	APPROXIMATE OPERATIONAL ELEVATIONS ABOVE TOWER BASE (METERS)
Wind (speed and direction)	11.0 and 62.0
Relative Humidity	10.0
Differential Temperature	10.0 to 61.0
Ambient Temperature	10.0

NOTE: The above information is displayed in the Control Room via the plant computer. The Atmospheric Stability Class is available from the computer.

NOTE: The upper temperature is the ambient temperature plus the differential temperature value as displayed on the plant computer.

TABLE 5.5.7-2
SEISMIC MONITORING

	Instrument and Sensor Locations	Measurement Range
1.	South of the Unit 2 Waste Retention Basin	0 – 2 g
2.	Containment Building Inlet Purge Valve	0 – 2 g

NOTES:

1. Reading 0.01g alarms in Control Room. Retrieval/analysis of data from seismic instrumentation takes approximately 60 minutes.
2. Powered by plant non-vital AC with battery backup.

TABLE 5.5.7-3
RADIATION MONITORING SYSTEM

CHANNEL	LOCATION	TYPE	RANGE
	Area Monitors		
R-1	Control Room	γGM Tube	10^{-1}-10^{4} mR/hr
R-2	Containment (Normal Range)	γGM Tube	10^{-1}-10^{4} mR/hr
R-3	PASS Panel	γGM Tube	10^{-1}-10^{4} mR/hr
R-4	Charging Pump Room	γGM Tube	10^{-1}-10^{4} mR/hr
R-5	Spent Fuel Building	γGM Tube	10^{-1}-10^{4} mR/hr
R-6	CVCS Sampling Room	γGM Tube	10^{-1}-10^{4} mR/hr
R-7	In-Core Instrumentation Cubicle	γGM Tube	10^{-1}-10^{4} mR/hr
R-8	Drumming Station	γGM Tube	10^{-1}-10^{4} mR/hr
R-9	Letdown Line	γGM Tube	10^{-0}-10^{5} mR/hr
R-32 (A&B)	Containment (High Range - 2 Channels)	Ion Chamber	10^{0}-10^{7} R/hr
R-33	Monitor Building	γGM Tube	10^{0}-10^{5} mR/hr
	Effluent Monitors		Sensitivity
R-11	Containment Atmosphere or Plant Vent	Off-Line Particulate (γ)	10^{-9}-10^{-6} μCi/cc
R-12	Containment Atmosphere or Plant Vent	Off-Line Noble Gas (β)	10^{-6}-10^{-1} μCi/cc
R-14A	Plant Vent Particulate	Off-Line Particulate (β,γ)	10^{-9}-10^{-6} μCi/cc
R-14B	Plant Vent Iodine	Off-Line Iodine (γ)	10^{-9}-10^{-6} μCi/cc
R-14C	Plant Vent Noble Gas	Off-Line Noble Gas (β,γ)	10^{-7}-10^{-2} μCi/cc
R-14D	Mid-Range Plant Vent	Off-Line Noble Gas (β,γ)	10^{-3}-10^{2} μCi/cc
R-14E	High-Range Plant Vent	Off-Line Noble Gas (β,γ) (with passive particulate & iodine samplers)	10^{0}-10^{5} μCi/cc
R-18	Waste Disposal Liquid Discharge	In-Line Liquid (γ)	10^{-5}-10^{-2} μCi/cc

TABLE 5.5.7-3 (Continued)
RADIATION MONITORING SYSTEM

CHANNEL	LOCATION	TYPE	RANGE
	Effluent Monitors (Cont.)		
R-20	Fuel Handling Building: Basement Exhaust	Off-Line Noble Gas(β)	10^{-6}-10^{-1} μCi/cc
R-30	High-Range Basement Exhaust	On-Line Noble Gas (γ) (with passive particulate & iodine samplers)	10^{-2}-10^{3} μCi/cc
R-22	E&RC Building	Off-Line Particulate (γ)	10^{-5}-10^{-1} μCi/cc
		Off-Line Iodine (γ)	10^{-9}-10^{-6} μCi/cc
		Off-Line Noble Gas (β,γ)	10^{-7}-10^{-2} μCi/cc
R-23	Radwaste Building	Noble Gas Grab Sample Only Particulate Air Sampler Only Iodine Sampler Only	
R-38	TSC-EOF Building	Off-Line Particulate (β,γ)	10^{-5}-10^{-1} μCi/cc
		Off-Line Iodine (γ)	10^{-9}-10^{-6} μCi/cc
		Off-Line Noble Gas (β,γ)	10^{-7}-10^{-2} μCi/cc
	Process Monitors		
R-15	Condenser Air Ejector	In-line Noble Gas (γ, GM Tube)	$I0^{-6}$-$I0^{-1}$ μCi/cc
R-16	Containment Fan Cooling Water	In-line Liquid (γ)	$I0^{-5}$-$I0^{-2}$ μCi/cc
R-17	Component Cooling Water	In-line Liquid (γ)	10^{-5}-$I0^{-2}$ μCi/cc
R-19A	Steam Generator Liquid	Off-line Liquid (γ)	$I0^{-7}$-$I0^{-2}$ μCi/cc
R-19B	Steam Generator Liquid	Off-line Liquid (γ)	$I0^{-7}$-$I0^{-2}$ μCi/cc
R-19C	Steam Generator Liquid	Off-line Liquid (γ)	$I0^{-7}$-$I0^{-2}$ μCi/cc
R-24A	N-16 Main Steam Line A	On-line (γ)	1 – 150 gpd
R-24B	N-16 Main Steam Line B	On-line (γ)	1 – 150 gpd
R-24C	N-16 Main Steam Line C	On-line (γ)	1 – 150 gpd
R-21	Upper Level Exhaust	Off-line Noble (β)	10^{-6}-10^{-1} μCi/cc
R-31A	Main Steam Line A	On-Line Noble Gas (γ)	10^{-0}-10^{5} mR/hr
R-31B	Main Steam Line B	On-Line Noble Gas (γ)	10^{-0}-10^{5} mR/hr
R-31C	Main Steam Line C	On-Line Noble Gas (γ)	10^{-0}-10^{5} mR/hr

TABLE 5.5.7-4
PORTABLE RADIATION SURVEY INSTRUMENTS

INSTRUMENT	TYPE	RANGE
Eberline 6112B	β,γ Survey	0 - 10^3 Rem/hr
Ludlum - 3	β,γ Survey	0 - 200 mRem/hr
Ludlum - 5	β,γ Survey	0 - 2,000 mRem/hr
Ludlum LM-177	β,γ Frisker	0 - 50,000 cpm
Eberline PNR-4	Neutron Survey (BF_3)	0 - 5000 mRem/hr
Eberline RO2A	β,γ Survey	0-50,000 mRem/hr
Eberline RO-2	β,γ Survey	0-5,000 mRem/hr
Eberline RO-20	β,γ Survey	0-50,000 mRem/hr
Johnson 2000W	β,γ Survey	0 - 10^3 Rem/hr
Fag FH40F3	γ Survey	300mRem/hr - 99.9 Rem/hr
Fag FH40F4	γ Survey	1mRem/hr - 999 mRem/hr
Eberline ESP-1	α Frisker/Scaler	Background - 33,000 cps
Fag FH40F6	γ Survey	1mRem/hr - 999 mRem/hr

TABLE 5.5.7-5
LOCATIONS OF ENVIRONMENTAL SAMPLING STATIONS

STATION #	LOCATION	TYPE(S) OF SAMPLE (1)
1	Florence, SC (Control Station)[2], 26 miles ESE @ 119°	AP, AC, TL
2	Information Center, 0.2 miles S @ 180°	AP, AC, TL
3	Microwave Tower, 0.7 miles N @ 5°	AP, AC, TL
4	Spillway, 0.4 miles ESE @ 110°	AP, AC, TL
5	Johnson's Landing, East Shore of lake across from plant intake 0.9 miles ENE @ 73°	AP, AC, TL
6	Information Center, 0.3 miles SW @ 214°	AP, AC, TL
7	Progress Energy Hartsville office, 5.3 miles ESE @ 114°	AP, AC, TL
8	Is located on an oak tree near a transmission tower, reached by traveling approximately 0.5 mile down the road to the Black Creek railroad trestle.	TL TL
9	Is located on the second transmission tower down a dirt path on the south side of Highway 151. This location is 0.4 mile southeast of the intersection of Highway 151 and Road S-16-23.	TL
10	Is located on Power Pole 20 on Road S-16-413 at corner of the cemetery nearest the dirt road directly behind the Clyde Church of God.	TL
11	Is located on the third power pole from the intersection of Road S-16-413 and Road S-16-23. This location is on the southwest side of Road S-16-413.	TL
12	Is located at the rejoining of a dirt road 0.4 mile south of Road S-16-23. The dirt road is 200 feet southwest of the intersection of Road S-16-413 and Road S-16-23.	TL
13	Is located on a tree on the outside of a 90° turn, at the edge of a field, off a dirt road extension of S-16-846.	
14	Is located on a light pole in the parking lot of the First Baptist Church of Pine Ridge. This location is on Highway 151 approximately one mile north of its intersection with S-16-23.	TL
15	Is located on a pine tree adjacent to the ash pond. This location is 0.5 mile down a dirt road 1.1 miles north on SC 151 from the intersection at S-16-23 and is on the left as the ash pond is approached.	TL

TABLE 5.5.7-5 (Continued)
LOCATIONS OF ENVIRONMENTAL SAMPLING STATIONS

STATION #	LOCATION	TYPE(S) OF SAMPLE (1)
16	Is located on a power pole at the southeastern corner of the Darlington County IC Turbine Plant. This location is within the fenced area just past two large storage tanks.	TL
17	Is located on a pole on the left side of the discharge canal at the Darlington County Plant I.C. Turbine Plant Emergency Water Pumping Station	TL
18	Is located on a tree on the slight incline to the right approximately 50 feet before the remnants of the Black Creek railroad trestle.	TL
19	Third power pole on RD. # S-16-23 from intersection SC 16-39, 1.0 miles E.	TL
20	Power Pole #47 at right side of Road # S-16-39 going north 1.3 miles ENE	TL
21	Located near yard of A. Atkinson home across RD S-16-39 on tree on right of driveway entrance	TL
22	Shady Rest at entrance on left on tree. NNE	TL
23	On tree on southwest side of RD S-16-39, .5 mile south of intersection of RD S-16-39 and RD S-16-23, near "Blueberry Hill" on New Market Rd on a tree on the right down from mound. ESE	TL
24	151 north past peach farm, first paved road #S-13-711 left. Fifth pole left side of road, 5.0 miles NW	TL
25	Road #S-13-346 off 151 North. Cross R.R. tracks and proceed 3/8 mile before Morrison's Bridge. Power pole on right.	TL
26	Power pole #32J-6, on Road #S-13-346 0.5 miles east of Robinson Middle Bridge	TL
27	Road #S-13-763, 1.3 miles from intersection 5.0 miles NNE	TL
28	North side of RD S-16-39. Location 1.6 miles east of RD S-16-21 just past curve. NE	TL
29	Transmission pole nearest Road #S-16-20; ½-mile south of lookout tower	TL
30	Road #S-16-20, power pole 4.6 miles E	TL
31	Lakeshore Drive, Pole #1122 right side of road 4.6 miles ESE	TL

TABLE 5.5.7-5 (Continued)
LOCATIONS OF ENVIRONMENTAL SAMPLING STATIONS

STATION #	LOCATION	TYPE(S) OF SAMPLE (1)
32	Located in Hartsville on Kalber drive at stop sign on right of road. SE	TL
33	Power Pole #25-4, left side of Road #S-16-493 near Harley Segar's driveway 4.6 miles SSE	TL
34	Transmission pole nearest Road #S-16-772; near Kelly Bell Church 4.6 miles S	TL
35	Power Pole 50/1 down from intersection of S-31-14 and S-31-51. ~1.7 miles west of Kellybell Church toward Ashland. SSW	TL
36	Power Pole 3/4-miles down paved road off Road #S-16-85 4.7 miles SW near Microwave tower in Ashland.	TL
37	Transmission tower on the right, off a dirt road (Pine Cone Road). Left off highway S.C. 16-23 WSW	TL
38	Located across from Union United Methodist Church and 1.4 miles north of intersection of Road S-16-231 and S-16-23. Entrance to clay dirt road, left on tree. 4.9 miles W	TL
39	Third power pole (#31) 0.15 mile from intersection of Road S-16-231 and Road S-13-172, 5.0 miles WNW	TL
40A	Black Creek @ Road 1623, 0.6 miles ESE (Indicator)	SW
40B	Artesian Well 0.6 miles ESE	GW
41	Black Creek (Control Station)[1], 7.2 miles NNW	SW
42	Unit 1 Deep Well Near Site Entrance	GW
43	Unit 2 Deep Well	GW
44	East Shore of Lake, Shady Rest, 1.9 miles NNE	SS
45	Site varies within Lake Robinson	FH
46	Prestwood Lake, 4.9 miles ESE	FH
47	Lake Bee (Control Station)[1], 13 miles NNW	FH
49	One location greater than 5 miles from plant site; least deposition rate (Control Station)[1]	FP
50	SSE of Progress Energy Property[3]	BL
51	NNE of Progress Energy Property[3]	BL
52	10.0 miles W (Control Station)[1]	BL

TABLE 5.5.7-5 (Continued)
LOCATIONS OF ENVIRONMENTAL SAMPLING STATIONS

STATION #	LOCATION	TYPE(S) OF SAMPLE (1)
54	Auburndale Plantation[2], 10.1 miles E	MK, FP
55	West Settling Basin	AP, AC, TL
57	SW Bank of Ash Pond, 1.1 miles NW	SW, SS
58	One location within 3 miles of site in sector with the highest deposition rate based on the latest information or historical date (location may vary)	FP

FOOTNOTES:

1. Control stations are locations outside the influence of plant effluents.
2. Water from Black Creek is used to irrigate feed and fodder for Auburndale Plantation's Dairy operation. This dairy is located approximately 11 miles East at 90° from site.
3. Sample points 50 and 51 are the highest and the second highest D/Q values, respectively. These locations are more restrictive than site boundary locations.

(1) Key to Symbols:

AC	Air Cartridge (Iodine)
AP	Air Particulate
FP	Food Product
FH	Fish
GW	Ground Water
MK	Milk
SS	Shoreline Sediment
SW	Surface Water
TL	Thermoluminescent Dosimeter (TLD)

5.6 Maintaining Emergency Preparedness

Emergency preparedness at HBRSEP will be maintained by:

- Preparing the emergency organization members and the public for proper emergency response actions through training, drills and exercises, and public education programs;
- Periodic review and update of the Robinson Emergency Plan and its implementation procedures;
- Periodic inventory and calibration of emergency equipment and instrumentation; and
- Cognizance of the Plant Nuclear Safety Committee over safety-related issues.

The Emergency Preparedness Staff is responsible for maintaining Emergency Preparedness at HBRSEP Plant as outlined in Section 5.6.1.3, "Emergency Preparedness Staff."

5.6.1 Organizational Preparedness

Organizational preparedness is maintained through an integrated training program that includes general orientation of all persons at the site and detailed training of individuals and groups required to perform specific functions and actions during an emergency condition. The training program provides initial training and annual continuing training by completion of Annual Requalification Checklist for designated positions to include drill or exercise participation. Initial and Requalification Checklists include a review of applicable procedures and job responsibilities. Classroom training may be provided as necessary.

Annual, as used herein, indicates once per calendar year.

1. Training

The primary objectives of the training program are to:

1. Familiarize appropriate individuals with the Plan and the procedures that implement the Plan.
2. Instruct individuals in their duties and responsibilities.

5.6.1.1 (Continued)

3. Periodically present significant changes in the scope or contents of the Plan or procedures which implement the Plan.

4. Provide continuing training, once per calendar year, to ensure that personnel are familiar with weaknesses in ERO performance and current industry issues.

Each individual, other than escorted personnel who is to be badged for Unit 2 access must receive Plant Access Training (PAT) Level I which consists of notification, basic fundamentals of radiation, and instruction methods used at HBRSEP in the event of an emergency.

Each individual badged for Unit No. 2 access to the Radiation Control Area (RCA) and/or is a member of the onsite Emergency Response Organization also receives Radiation Worker Training (RWT) on the basic principles of radiological safety including the effects of radiation and use of radiation detection devices.

The Emergency Plan Training Program described in EPPRO-03,"Training and Qualifications" assures training of those individuals who may be called to respond to an emergency at HBRSEP. Initial training and retraining is included in this program.

The Emergency Plan Training Program provides training for the following groups of personnel to perform the specific tasks assigned to them in the emergency organization.

Site Emergency Coordinator
TSC Directors
Emergency Communicators
Accident Assessment Personnel
Security Personnel
Dose Projection Personnel
Radiation Control Personnel
Environmental Monitoring Personnel
Damage Control Personnel
EOF Managers

5.6.1.1 (Continued)

Offsite groups who may be requested to assist in emergency first aid
Fire Brigade (Operations Training)

All ERO positions are required to complete an Annual Re-Qualification Checklist.
The specific training is described in lesson plans, study guides, and in EPPRO-03, "Training and Qualifications."

Training of offsite organizations is described in their radiological emergency plans and is their responsibility. Training for Carolina Pines Regional Medical Center, Darlington County Emergency Medical Service, Lake Robinson Rescue Squad and off site fire response organizations will include the procedures for notification, basic radiation protection, and their expected roles. For those local support services organizations who may enter the site (ambulance, rescue, and fire), training by Progress Energy will also include site access procedures and the identity (by position and title) of the individual in the HBRSEP organization who will control the organization's support activities. Progress Energy will assist these offsite organizations in performing their radiological emergency response training as related to HBRSEP and as requested by them.

Progress Energy will conduct a coordinated public information program to acquaint the news media with emergency plans, information concerning radiation and points of contact for release of public information during an emergency. This may include providing prepared information or formal presentations. The program also includes information on nuclear plant operations. Another method used by Progress Energy public information staff is periodic visits to the various media around the site. HBRSEP relationships with corporate personnel in this area is described in EPPRO-01, "Program and Responsibilities."

5.6.1 (Continued)

2. Drills and Exercises

This section describes provisions for conducting periodic drills and exercises to test the adequacy of the Plan and implementing procedures, emergency equipment, and the preparation and training of emergency personnel.

Each exercise scenario will include the following:

1. The basic objective(s) of the exercise.
2. The date(s), time period, place(s), and participating organizations.
3. The simulated events.
4. A time schedule of real and simulated initiating events.
5. A narrative summary describing the conduct of the exercises to include such things as simulated casualties, offsite fire or police department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities.
6. Arrangements for qualified evaluators.

5.6.1.2 (Continued)

a. Drills

Emergency drills are supervised instruction periods aimed at testing, developing and maintaining skills in a particular operation. Practice drills, such as table top exercises and practical exercises may be used as training for on-the-spot correction of erroneous performance. Personnel will participate in periodic drills, an exercise, or table tops to test their skills as follows:

- Communication Drills: Communications with state and local governments within the Plume Exposure Pathway Emergency Planning Zone shall be tested monthly. Communications with federal emergency response organizations and states within the ingestion pathway shall be tested quarterly. Communications between the nuclear facility, state and local emergency operations centers, and field assessment teams shall be tested annually. Communications drills shall also include the aspect of understanding the content of messages.

- Fire Drills: Fire drills will be held in accordance with the Fire Protection Manual.

- Medical Emergency Drills: Medical emergency drills involving a simulated contaminated and injured individual will be conducted annually. The actual offsite portions of these drills may be conducted as part of an exercise.

- Radiological Monitoring Drills: Radiological monitoring drills will be conducted annually. These drills will include environmental measurement and analysis of external whole body doses, and water, vegetation, soil, and air sample media.

5.6.1.2.a (Continued)

- In-Plant Radiation Protection Drills: Radiation protection drills, including response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements, will be conducted semiannually.

The above drills will be evaluated by a qualified evaluator. The degree of participation by outside agencies in conducting these drills may vary and their action may actually be simulated.

b. Exercises

An exercise is an event that tests the integrated capability of major response organizations. Periodic exercises will be conducted as required by 10 CFR, Part 50, Appendix E. These exercises will be based on a scenario which is ultimately declared as at least a Site Area Emergency. The scenario will be varied from exercise to exercise such that major elements of the plant, county, and state plans and emergency organizations are tested within a 6-year period. One exercise shall start between 6:00 pm and 4:00 a.m. or any weekend hours once every 6 years. Every sixth year, the exercise will be expanded to involve the federal response organizations in addition to the state and local organizations. Advance knowledge of the scenarios and the times of the exercises will be kept to a minimum to ensure a realistic participation by those involved. Exercises should be conducted under various weather conditions. Some exercises should be unannounced.

Each exercise scenario will include a list of performance objectives and a description of the expected responses. Specific functions to be evaluated are:

- Condition recognition and reporting.
- Assessment.
- Offsite notification, including Progress Energy offsite personnel and protective action determination/recommendations.
- Offsite response (when participation is required).

5.6.1.2.b (Continued)

- Site response coordination, including communications, logistics, facility staffing, information gathering and analysis, and coordination with offsite agencies.
- Corrective actions.
- Protective actions.
- Record keeping.
- Monitoring.
- Plant operation.

Qualified evaluators from Progress Energy, federal, state, or local governments will observe and critique each exercise. A critique will be scheduled at the conclusion of each exercise to evaluate the ability of all participating organizations to respond. The critique will be held as soon as possible after the exercise. A formal written evaluation of the exercise will be prepared by the Supervisor - Regulatory Support or his/her designee, following the critique. The performance of exercises and drills and the mechanism for documenting and using information learned in drills and exercises is shown in EPPRO-01, "Program and Responsibilities."

Exercise controllers, evaluators, and participants (if appropriate) will prepare written descriptions of the actions they observed and will comment as to how the part of the exercise they observed matched the performance criteria. The Emergency Preparedness Staff will determine the corrective actions necessary and the schedules for performing them and will evaluate the corrective actions taken.

5.6.1 (Continued)

3. Emergency Preparedness Staff

The Supervisor – Regulatory Support is responsible for the implementation and maintenance of the EP program.

The Emergency Preparedness Staff is responsible for coordinating onsite and offsite radiological emergency response planning. They prepare and maintain the implementing procedures and ensure that these procedures are properly implemented. They are also responsible for performing the following planning functions:

1. Interfacing with federal, state, county, and local planners.
2. Revising and updating the Plan in response to new federal regulations, modifications identified during exercises and drills, and changes in hardware and personnel.
3. Coordinating an exercise and other periodic drills.
4. Arranging for training to meet the identified needs of offsite support personnel.
5. Identifying corrective actions needed following an exercise, assigning responsibility for implementing these actions, specifying a schedule for completion of these actions, and evaluating the adequacy of the actions taken.
6. Maintaining and negotiating agreements with state and county response agencies, federal assistance agencies, and medical and fire support agencies. Agreements will be signed at the appropriate level of management.

4. Public Education

The Governor's Office, through the Public Information Office, has overall responsibility for maintaining a continuing disaster preparedness public education program. Such a program, prepared by the State of South Carolina, with the cooperation of the local governments and Progress Energy, is intended to ensure the members of the public are:

5.6.1.4 (Continued)

- Aware of the potential threat of a radiological emergency;
- Able to recognize a radiological emergency notification; and
- Knowledgeable of the proper immediate actions (e.g., return to home, close windows and turn on radio) to be taken.

A program of this type includes education on protective actions to be taken if shelter is prescribed and the general procedures to follow if an evacuation is required. It also includes general educational information on radiation and how to learn more about emergency preparedness.

Additional information about public education and information can be found in Section 5.4.4.7, "Protective Actions - Offsite/Public" and in the South Carolina Operational Radiological Emergency Response Plan.

5.6.2 Review and Update of the Plan and Implementation Procedures

The Plan and its implementation procedures are intended to provide for continuous emergency preparedness. In addition to the training, drills, and exercises, regular reviews and audits are performed. The reviews and audits are described in the following sections.

1. Plan Updates

The Emergency Preparedness Staff is responsible for coordinating the updating of the Plan and implementing procedures. They schedule an annual review of the Plan by the Plant Nuclear Safety Committee (see Section 5.6.4, "Plant Nuclear Safety Committee"). Any proposed changes to the Plan due to regulatory revisions, experiences of drills and exercises, or other requirements are reviewed by that committee and approved by the Manager – Support Services Nuclear. Approved changes to the Plan will be distributed to organizations and individuals with responsibility for implementation of the Plan. Revised pages will be marked to show where changes have been made.

5.6.2 (Continued)

2. Independent Audit and Review

In addition to the reviews conducted at the Plant, an independent review of the Plan, procedures which implement the Plan, and the overall state of emergency preparedness will be conducted as specified in 10CFR50.54(t) by the Nuclear Assessment Section. Written reports of the findings of these audits and reviews will be provided to Corporate Management. Each report will specifically address the adequacy of interfaces with state and local governments, of drills and exercises, and of emergency response capabilities and procedures. The reports will be retained for five years. Corrective actions from reviews/audits will be addressed through the Corrective Action Program.

3. Offsite Agreements

Agreements with supporting organizations are reviewed annually and updated as necessary.

5.6.3 Maintenance and Inventory of Emergency Equipment and Supplies

To ensure that equipment and supplies are maintained in a readiness state, periodic maintenance and inventories are performed as described in the following sections.

1. Emergency Equipment and Supplies

A listing of emergency equipment and supplies to be inventoried is included in EPPRO-02, "Maintenance and Testing." This listing provides information on frequency of inventory and work group responsible for equipment and supplies.

An inventory of emergency equipment and supplies is held on a quarterly basis and after use in an emergency. During this inventory, radiation monitoring equipment is to be checked to verify that required calibration and location are in accordance with the procedure requirements. Respiratory protection equipment, maintained for emergency purposes, is also inspected and inventoried.

5.6.3 (Continued)

2. Medical Equipment and Supplies

At least twice each year and after use in an emergency, the contents of emergency medical equipment and supplies located in the First Aid Room is to be inventoried, inspected, replaced, replenished and/or resterilized as necessary. Company personnel inspect and inventory emergency medical supplies required to support a medical emergency at the plant.

5.6.4 Plant Nuclear Safety Committee

The Plant Nuclear Safety Committee (PNSC) is a standing committee comprised of HBRSEP personnel that provides timely and continuing review of plant operations to assist the Plant General Manager in maintaining cognizance of plant activities, with particular emphasis on safety-related matters.

The PNSC provides a means for the regular overview, evaluation and maintenance of plant nuclear safety. They will conduct reviews of plant activities as described in PLP-001, Plant Nuclear Safety Committee.

Finally, the Plant Nuclear Safety Committee must review changes to the Robinson Emergency Plan.

5.7 Recovery

5.7.1 General

Once the Site Emergency Coordinator has declared that the emergency condition has passed, steps will be taken to recover from the incident. The Emergency Response Manager will advise appropriate organizations, in accordance with EPNOT-00, "Notification and Emergency Communications", that recovery operations are initiated and that the Recovery Organization as shown in Figure 5.7.2.1, "Recovery Organization" will be assembled in the EOF. All recovery actions will be pre-planned in order to minimize radiation exposure or other hazards to recovery personnel. Recovery operations are classified as described in Section 5.7.3, "Recovery Planning." Guidance for recovery considerations is contained in EPEOF-01, "Emergency Response Manager" and EPEOF-10, "Recovery Manager and Recovery Operations."

5.7.1 (Continued)

The overall goals of the recovery effort are to assess the in-plant consequences of the emergency and perform cleanup and repair operations. This effort includes marshaling of the Corporate resources and interfacing with outside agencies.

5.7.2 Recovery Organization

The recovery organization consists of the Recovery Manager, managers of support functions who are responsible to the Recovery Manager, and supporting personnel. This organization may be modified during the recovery process to better respond to the conditions at the plant. Recovery activities will be directed from the Recovery Center (EOF).

The Recovery Center at HBRSEP will be established in the Emergency Operations Facility. Provisions have been made for expansion into construction buildings and mobile facilities, if required to support an extensive recovery effort.

Activation of the recovery organization will be initiated by the Vice - President, Robinson Nuclear Plant (or designated alternate). The recovery organization will then be established to provide for recovery of the facility. The recovery organization may begin to develop plans for recovery of the facility while the emergency is still in progress. However, these efforts will not be permitted to interfere with or detract from the efforts to control the emergency situation. During the emergency phases of the incident, the recovery organization resources will be available to assist and provide support for the Site Emergency Coordinator.

1. Recovery Manager

   The Recovery Manager will normally be designated by the Emergency Response Manager. The recovery organization, under the direction of the Recovery Manager, will have the following responsibilities:

   1. Develop a recovery plan.

   2. Identify resources needed to complete the recovery.

   3. Obtain any services and equipment necessary to complete the needed repair.

5.7.2.1(Continued)

4. Conduct post-accident evaluations of the causes and consequences of the incident.

5. Assess and determine the overall damage.

6. Obtain all necessary licenses, or amendments to licenses, required for repair of the unit and disposal of waste products.

7. Coordinate with local and state agencies to keep them informed of onsite activities on a timely basis and provide support for any offsite protective actions required during the recovery phase.

8. Maintain security for the plant and associated facilities.

9. Coordinate with NRC activities at the site in an effort to avoid duplication and minimize impact on the plant staff.

10. Control personnel exposure during re-entry and recovery (See Section 5.4.4.3.b, "Exposures During Repair/Re-entry Efforts").

2. Plant General Manager

The Plant General Manager or designee is responsible, as shown in Figure 5.7.2.1, "Recovery Organization", for implementation of in-plant recovery activities with the objective of maintaining a safe shutdown condition and controlling sources of radioactivity in the plant. The Plant General Manager will report to the Recovery Manager during the recovery phase.

Responsibilities of the Plant General Manager include the following:

1. Direct operations of the plant site.

2. Coordinate the plant staff's efforts to identify any damages to the facility.

3. Approve and implement license change requests.

4. Approve and implement required engineering modifications resulting from the incident.

5.7.2.2 (Continued)

5. Approve and implement tests and experiments proposed for the plant that affect nuclear safety.
6. Approve and implement special procedures required to recover from the incident.
7. Provide security forces as necessary for the plant site, including the visitor center.
8. Coordinate in-plant maintenance and control activities utilizing plant maintenance and support personnel.
9. Coordinate training of in-plant personnel on any required emergency operating and maintenance plan and procedures in support of the recovery operation.
10. Coordinate onsite health physics activities, including onsite sampling program, dose assessment, dose management, and radiation protection programs.
11. Provide information and recommendations to the Recovery Manager concerning future operations that could affect the plant or the environment.

3. Technical Analysis Manager

The Technical Analysis Manager is normally a member of Robinson Engineering Support Section. This individual is responsible, as designated in Figure 5.7.2.1, "Recovery Organization", for analysis and development of plans and procedures to support the recovery operation and to maintain the affected unit in a safe shutdown condition in a manner which minimizes the effect on the health and safety of the public. The Technical Analysis Manager will report to the Recovery Center upon request by the Recovery Manager and provide technical support as needed.

Responsibilities of the Technical Analysis Manager include:

1. Provide engineering support to the Recovery Manager in assessing the cause of the emergency.
2. Provide engineering support to the Recovery Manager in assessing the extent of equipment and systems damage.

5.7.2.3 (Continued)

3. Assist the Recovery Manager in establishing a list of plant equipment/systems modifications required for plant safe cold shutdown, plant cleanup, and plant restart.

4. Develop an engineering support plan compatible with the overall plant recovery plan. This plan will include allocation of engineering personnel resources.

5. Coordinate and supervise the engineering work performed by the Engineering Group including the architect-engineer, nuclear steam system supplier, and other engineering consultants.

6. Provide engineering support in developing the detailed plant recovery procedures as requested by the Recovery Manager.

7. Provide the necessary engineering information requested by the Recovery Manager for reporting to Progress Energy Management and any other agencies.

8. Development and review of engineering information requested by the Recovery Manager.

9. Coordinate the timely transmittal of engineering modification design documents (specifications and drawings) to the Plant Support and Plant Procurement Groups.

4. Engineering Manager

The Engineering Manager will normally be a Engineering Superintendent of the Robinson Engineering Support Section. This individual is responsible, as designated in Figure 5.7.2.1, "Recovery Organization", for directing and administratively controlling the Progress Energy recovery organization engineering staff while providing engineering and design support to meet requirements of the recovery operation. The Engineering Manager will report to the Recovery Center upon request by the Recovery Manager.

5.7.2.4 (Continued)

Responsibilities of the Engineering Manager include:

1. Provide support to the Recovery Manager in assessing the cause of the emergency.

2. Provide technical support to the Recovery Manager in systems analysis, core analysis, operating and maintenance procedural revisions, licensing information development and coordination, plant systems design data development, continued assessment of plant systems interaction, and continuing determination of the safety status of the plant.

3. Coordinate the receipt and assessment of technical information onsite and offsite related to plant systems and facility operations, and submit timely recommendations to the Recovery Manager for implementation.

4. Provide support to the Recovery Manager as needed to report to upper management and any other organization on the progress of the recovery operations.

5. Provide technical interface as authorized by the Recovery Manager to utility groups, consultants, technical investigation groups, and regulatory agencies.

6. Assess the impact of the incident on continued operation of other Progress Energy nuclear plants, and submit results of this assessment to the Recovery Manager for review and subsequent submittal to Progress Energy Management.

7. Establish a stand-by list of Progress Energy personnel to provide additional timely technical support as may be requested by the Recovery Manager during the recovery operation.

5.7.2 (Continued)

5. Construction Manager

The Construction Manager will normally be a member of the Plant General Manager Section or Robinson Engineering Section. This individual, as designated in Figure 5.7.2.1, "Recovery Organization," will coordinate the construction activities to meet the requirements of the recovery operation. The Construction Manager will report to the Recovery Center upon request by the Recovery Manager.

Responsibilities of the Construction Manager include:

1. Provide support to the Recovery Manager in assessing the extent of any structural damage.

2. Provide support to the Recovery Manager as required in assessing the cause(s) of the emergency.

3. Develop a construction plan, including the allocation of plant support personnel, to support the timely completion of identified plant modifications required during the recovery process.

4. Coordinate and supervise the construction work performed by outside contractors.

5. Provide the necessary timely information on construction progress to the Recovery Manager for reporting to Corporate Management and any outside agencies, as required.

6. Coordinate the timely transfer of installed equipment and/or systems (modifications) to the Plant Operations Unit in accordance with the established recovery procedures.

5.7.2 (Continued)

6. Administrative and Logistics Manager

The Administrative and Logistics Manager will normally be a member of the Site Support Services Section. This individual provides, as designated in Figure 5.7.2.1, "Recovery Organization", administrative, logistic, communications, and personnel support for the recovery operation. The Administrative and Logistics Manager will report to the Recovery Manager.

Responsibilities of the Administrative and Logistics Manager include:

1. Provide assistance to the Recovery Manager in the planning, scheduling, and expediting of recovery operations.

2. Provide communications personnel to install, maintain, and operate onsite communications facilities needed to carry out the recovery plan.

3. Provide purchasing personnel responsible for locating, ordering, and receiving equipment and materials needed to carry out the recovery plan.

4. Prepare an inventory of materials, supplies, and equipment that may be needed and locate potential suppliers.

5. Provide processing of expense accounts, distribution of checks from payroll, and administration of other personal financial aspects of the recovery organization.

6. Provide logistics arrangements for support personnel called in to assist in the recovery operations, including communications hardware, transportation, room and board.

7. Establish and maintain a cost control/accounting system for the recovery operation; preparing timely reports to keep the Recovery Manager and Corporate Management informed of actual expenditures and committed costs of the recovery operation.

8. Determine additional contracts, facilities, and services required by the recovery organization and provide these facilities and services.

5.7.2.6 (Continued)

9. Serve as a liaison between the Recovery Manager and the Legal Department.

10. Provide appropriate Corporate and Contractor insurance personnel to process claims for financial losses resulting from emergency activities.

11. Provide administrative services for the recovery organization such as clerical, typing, and duplication.

12. Provide support for the screening, orientation, and badging of support personnel.

7. Radiological Control Manager

The Radiological Control Manager is normally a member of the E&RC Staff. This individual is responsible, as designated in Figure 5.7.2.1, "Recovery Organization", for providing radiation protection and waste disposal plans consistent with the recovery operation.

Responsibilities of the Radiological Control Manager include:

1. Assist the Recovery Manager by providing as low as reasonably achievable (ALARA) review of engineering modifications and tasks proposed by the recovery organization, including necessary documentation of those reviews.

2. Coordinate with the Engineering Manager in the design of special packaging required for the transport of radioactive waste resulting from the incident and recovery operation.

3. Assist in assessment of offsite radiological consequences of the event utilizing information from available sources, and keep the Recovery Manager informed of the assessment.

4. Develop methods for sampling, treatment, and/or disposal of radioactive wastes resulting from the emergency and recovery operation.

5. Provide consultation, support, review, and inspection of special waste treatment facilities required during the recovery operation.

5.7.2.7 (Continued)

6. Provide dose calculations to the Recovery Manager for offsite areas based on data from available sources and/or mathematical modeling.

7. Assist the Plant Environmental and Radiation Control personnel with technical assistance, as needed.

8. Provide additional offsite monitoring of radiological effluents in the environment, as required.

9. Review the adequacy of schedules and priorities for tasks assigned to the Radiological Control Sub-unit.

10. Provide information and recommendations to the Recovery Manager concerning future operations that could affect the plant or the environment.

5.7.3 Recovery Planning

For convenience in planning, the recovery operations can be classified as follows:

1. Onsite recovery

2. Offsite recovery

These in turn will be considered in terms of three phases:

1. Emergency cleanup and repair,

2. Routine or long-term repair and recovery,

3. Decommissioning of plant.

5.7.4 Onsite Recovery Operations

Onsite recovery operations are performed in accordance with established plant procedures. Radiation and contamination levels for determining the need for decontamination and for returning areas or items to normal use are contained in the Radiation Control and Protection Manual (NGGM-PM-0002). Additional procedures will be developed as appropriate on a case-by-case basis.

5.7.5 Offsite Recovery Operations

1. General

The Progress Energy Recovery Manager will coordinate with and assist offsite agencies in the recovery operations.

The State will be the lead organization for offsite recovery operations and put emergency regulations into effect to ensure that no food items in the contaminated area are consumed or put on the market without the required health physics monitoring, and to control access into contaminated areas. Authorization for re-entry to offsite areas will be made by the senior elected official (Governor or designee) of the area concerned after consultation with the Recovery Manager and South Carolina Department of Health and Environmental Control (DHEC) and South Carolina Emergency Management Division.

2. Emergency Cleanup Operations

The most urgent tasks will be to clear (i.e., partially decontaminate) emergency paths to allow access to critical facilities and inhabited areas. These clearing operations will be necessary particularly to:

- Allow health physics teams to survey the contaminated areas,
- Allow farmers to provide emergency care for livestock that had to be left in contaminated areas or to assist them in moving the stock to uncontaminated areas,
- Allow emergency operations of utilities and services (power, water, telephone, sewage treatment, etc.) during the cleanup operation,

5.7.5.2 (Continued)

- Allow decontamination teams to perform the emergency and priority decontamination tasks (these emergency tasks will consist primarily of fire-hosing pavements, plowing or scraping unpaved areas adjacent to roads, and spraying paint or asphalt to fix loose contamination in place),

- Stabilize the contaminated areas so that the radioactive materials are not spread to other areas or leaked into streams. In particular, if public roads run through the area, cleanup of the road will be required, and cleanup of the area to some distance from the road will be needed to minimize exposure to travelers.

After the main roads and utilities have been put back into service, the urgency of the cleanup tasks will drop. However, the population that was evacuated will be eager to return, industrial operations that had to be shut down need to start up as soon as possible, and business operations need to be resumed.

Some farmland may have to be removed from use, which would cause hardship primarily to the occupants. Thus, it may be feasible to permanently evacuate such areas and pay the owner the market value. Such a step would probably occur at contamination levels where future crops would not be marketable due to the uptake of long-lived isotopes (primarily strontium).

Some of the buildings and houses may be contaminated to such a high level that it is more economical to demolish them than to decontaminate them. Areas where this occurs can be kept vacated; in such cases, demolition and burial can be a routine task, and the work can be scheduled over a longer period of time. Decontamination of the agricultural land may or may not be feasible. Where it is feasible, the changes in agricultural operations that are required can be made on a routine basis.

5.7.5 (Continued)

3. Countermeasures*

Countermeasures will have serious impact on the economy of contaminated areas, so they must be applied judiciously. They must be no more restrictive than necessary; however, once determined, they will be applied quickly and equitably, and may consist of:

- Reducing contamination on the surface of any fruits and vegetables that were in the field at the time of the accident by ensuring that the surfaces are washed, that the outer leaves of leafy vegetables are removed, and that more than normal preference is given to peeling.

- Altering production, processing, or distribution practices that affect the movement of radioactive contamination through food chain and into the human body. This will include storage of some food (primarily milk products) and animal feed supplies to allow radioactive decay (particularly of Iodine 131).

- Diverting affected products to uses other than human consumption.

- Condemning food.

- Decontaminating farmland where practical.

- Converting farmland to other uses for extended periods of time when decontamination is not practical.

- Decontaminating industrial buildings, stores and shops, and residences and removing milk-producing cattle from the contaminated pastures should be priority items.

The longer these activities are delayed, the greater will be the costs and consequently the claims.

* J. A. Auxier and R. O. Chester, eds., Report of the Clinch Valley Study, ORNL-4835 (January, 1973).

5.7.5 (Continued)

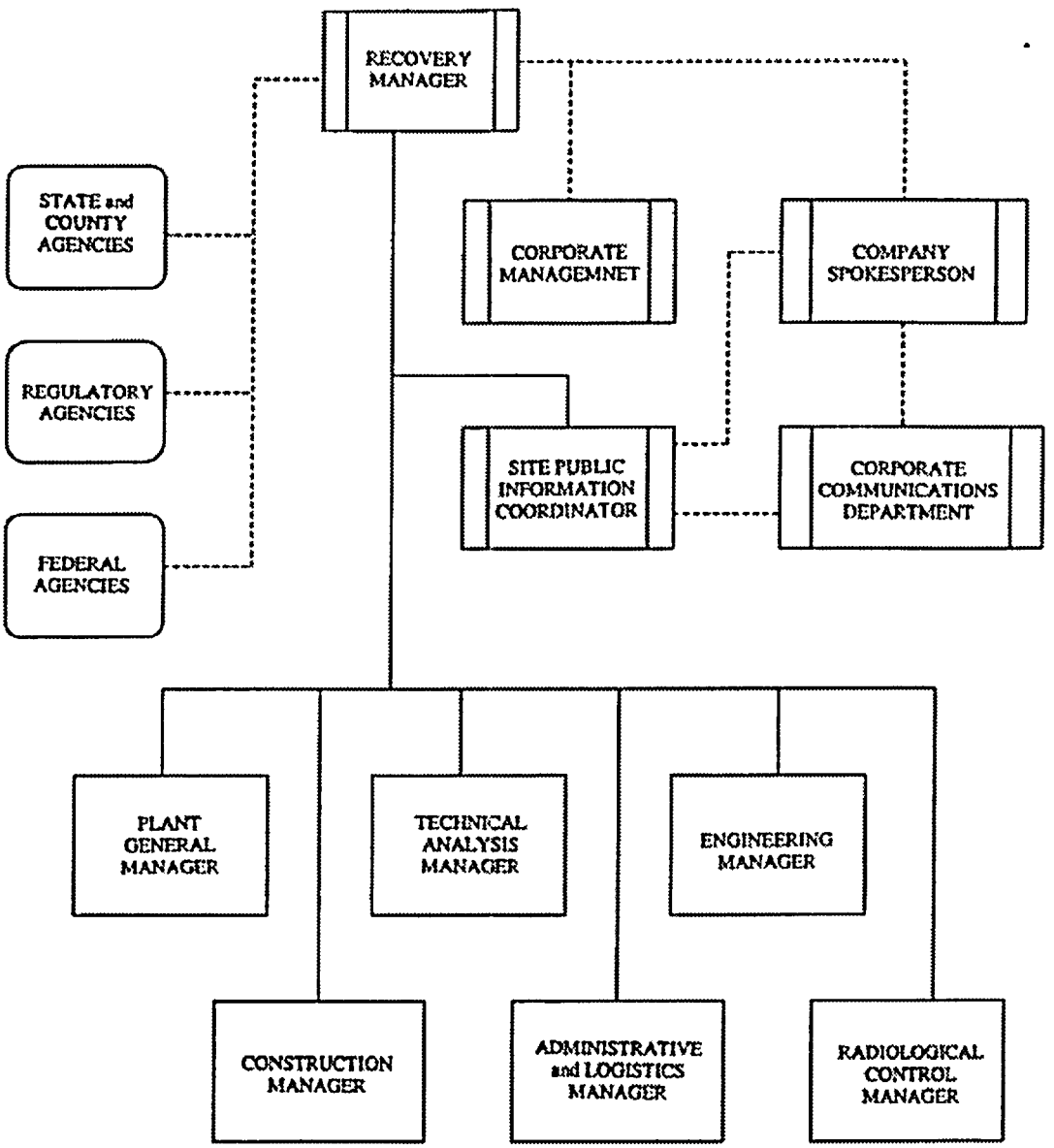
4. Monitoring and Dose Assessment

The South Carolina Department of Health and Environmental Control (DHEC), Bureau of Land and Waste Management, will be the lead agency in the collection and analysis of radiation monitoring reports and of environmental air, foliage, food, and water samples. DHEC will be assisted by qualified personnel from HBRSEP, and the Westinghouse Water Reactor Division.

Total population exposure will be periodically determined through a variety of procedures including:

- Examination of prepositioned TLDs.
- Bioassay.
- Estimates based on release rates and meteorology.
- Estimates based on environmental monitoring of food, water, and ambient dose rates.

FIGURE 5.7.2.1
RECOVERY ORGANIZATION



6.0 ATTACHMENTS

6.1 COMMUNICATIONS SYSTEMS

6.2 LETTERS OF AGREEMENTS

6.3 H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 OFFSITE AGENCY SUPPORT SUMMARY

6.4 DISTRIBUTION LISTS FOR PLAN AND PROCEDURES HBRSEP PLANT OPERATING MANUAL

6.5 MEDICAL TREATMENT AND ASSISTANCE

6.6 TECHNICAL BASIS OF EMERGENCY DOSE PROJECTION PROGRAM

6.7 PROCEDURES REQUIRED TO IMPLEMENT SECTIONS OF THE PLAN

6.8 CROSS-REFERENCE BETWEEN NUREG-0654 EVALUATION CRITERIA AND THE ROBINSON EMERGENCY PLAN

6.9 EMERGENCY ACTION LEVELS

COMMUNICATIONS SYSTEMS

A.0 INTRODUCTION

Communications systems are designed to facilitate emergency communications within HBRSEP and between HBRSEP and emergency facilities. Redundant means of communication are provided to locations which provide vital emergency response roles.

A.1 Plant Communication Systems

A.1.1 Public Address System

The public address system provides paging and party line communications between stations located throughout the plant. Inside and outside type wall and desk-mounted stations are used to communicate between roaming personnel and fixed work locations. Plant-wide instructions are issued using the paging feature. This system is powered from the plant uninterruptible power supply which employs battery reserve as well as diesel generator emergency supply. The one exception is the Administrative Building which does not have an uninterruptible power supply. See EE 94-079.

A.1.2 PBX Telephone System (Northern Telecomm.)

The private branch exchange (PBX) telephone system provides communication capability between telephone stations located within the plant by dialing the four-digit telephone station code. The PBX telephone system also provides for outside communications as discussed in Sections A.2.1, "Corporate Telephone Communications System" and A.2.2, "BellSouth Lines."

A.1.3 Sound Powered Telephone System

The sound powered telephone system is a communications system which uses the mechanical energy in the human voice to generate electrical pulses to power the system. It requires no outside source of power and is therefore very reliable. The system consists of phone jacks, wiring, and the sound-powered handsets. There is no separation in the circuits. A handset plugged into a jack is connected to all other handsets plugged into that circuit. Additional temporary circuits may be easily set up by attaching phone jacks to any unused cable between any points requiring sound-powered communications. Sound powered phone jacks are provided on selected instrument racks. Switch panels are provided in the Control room to cross-tie any circuit with any other circuit providing sound-powered phone communications between several plant areas.

A.1.4 Radio Transceivers for HBRSEP and Vicinity

Ultra high frequency (UHF) transceivers (portables) are used for point-to-point communications in the plant vicinity. A control station is located in the TSC/EOF to provide radio communications through ultra-high frequency repeaters. A primary and secondary source of power is provided for fixed base radio, with portable units powered by battery.

COMMUNICATIONS SYSTEMS

A.1.5 Back-up Telephone System (ESSX)
The Telephone System consist of lines between facilities and BellSouth. It consist of a separate offsite PBX system with back-up power systems for reliability. The Control Room, TSC, OSC, and EOF have phones which operate through this system. The ESSX can be used as a back up method for teleconferencing State and County Warning Points.

A.1.6 Plant Security Radio Transceivers
These transceivers are used by the plant security force for communications in and around the plant.

A.1.7 Vital Plant Parameter and Meteorological Data Communications
During an emergency, the Emergency Response Facility Information System (ERFIS), provides information on CRTs simultaneously in the Control Room, the Technical Support Center, Operational Support Center, and Emergency Operations Facility. Primary and secondary power sources are supplied to this system.

A.2 Offsite Communications Systems

A.2.1 Corporate Telephone Communications System (Voicenet)
Interconnected through the plant PBX, the Corporate telephone system provides a means to communicate with any other Corporate locations. This system is fiber optic cable routed separately, via transmission lines, and is separate from BellSouth service. The Corporate Telephone Communications System equipment is supplied power through a reserve battery bank which is backed up by an emergency generator at each terminal and repeater.

A.2.2 BellSouth
BellSouth lines, which supply public telephone communications, are used by Progress Energy to provide lines to plant emergency facilities. BellSouth provides primary and secondary power for their lines at the Central Office.

A.2.3 Facsimile Capability
All State and County warning points and Emergency Operations Centers along with the Control Room, TSC, EOF and JIC are equipped with facsimile machines. These may be used as a back up to the Selective Signaling System.

A.2.4 Dedicated Telephone System to Load Dispatcher
This system provides direct links between the Control Room and the load dispatcher. Transmission facilities are via the fiber optic Voicenet system. These lines appear on several phones in the Control Room and are selected by pushing the appropriate button on a multibutton phone. The lines are automatically rung at the load dispatcher identifying HBRSEP as the caller. Primary and secondary power is supplied at both ends.

COMMUNICATIONS SYSTEMS

A.2.5 Plant Security
The plant security radio control station, which is a part of the system discussed in Section A.1.6, "Plant Security", provides for radio communications to the Darlington County Sheriff's Office. Primary and secondary power is supplied.

A.2.6 Load Dispatcher Radio Communications
This system allows the load dispatcher to communicate with the Control Room, Unit No. 1 and mobile/portable units in the plant vicinity. The load dispatcher can also communicate with HBRSEP via fiber optic facilities and a repeater. Primary and secondary power sources are located throughout this system.

A.2.7 Corporate Informational Data Communications
Large central computers are located at the Corporate headquarters. Smaller special purpose computers are located at other Corporate facilities, including HBRSEP. The communications link between HBRSEP and Corporate headquarters allows the interchange, storage, and processing of information.

A.2.8 NRC Emergency Telecommunication System (ETS)
Dedicated telephone lines allow telephone communications from RNP to the NRC regional and national offices. Telephones connected through these circuits are located in the Control Room, the Technical Support Center, the NRC office, and the Emergency Operations Facility. Circuits for this system are available through the plant PBX. Primary and secondary sources of power are supplied.

A.2.9 Selective Signaling System
The Selective Signaling System consists of equipment and circuits linking HBRSEP with the offsite agencies involved in initial emergency notifications. This system can quickly conference the offsite agencies for notifications. The Control Room, TSC, EOF, Work Control Center, and the Simulator Control Room have these phones.

ATTACHMENT 6.2
Page 1 of 1
LETTERS OF AGREEMENTS

Letters of agreement will be maintained between the following off site organizations.

1. Memorandum of Understanding Between the South Carolina Emergency Management Division, the South Carolina Department of Health and Environmental Control, and Progress Energy Carolinas, Inc. (Ref-5.3.4.1)
2. Carolina Pines Regional Medical Center (Ref-5.3.3.2a)
3. Chesterfield General Hospital (Ref-5.3.3.2a)
4. Carolina Pines Regional Medical Center Emergency Room Supervisor (Ref-5.3.3.2a)
5. Darlington County (Ref-5.3.4.2)
6. Lake Robinson Rescue Squad (Ref-5.3.3.2b)
7. Darlington County Emergency Medical Service's (Ref-5.3.3.2b)
8. Hartsville Rescue Squad (Ref-5.3.3.2c)
9. Darlington County Fire District (Ref-5.3.3.2c)
10. Darlington County Sheriff's Department (Ref-5.3.4.2b)
11. Lee County Sheriff's Department (Ref-5.3.4.3b)
12. Chesterfield County Sheriff's Department (Ref-5.3.4.4b)
13. Chesterfield County (Ref-5.3.4.4)
14. Institute of Nuclear Power Operations (INPO) (Ref-5.3.3.1e)
15. Darlington County 911 Communications Center (Ref-5.3.4.2c)
16. Lee County (Ref-5.3.4.3)
17. Chesterfield General Hospital Emergency Room Supervisor (Ref-5.3.3.2a)
18. Lee County Enhanced 911 Facility (Ref-5.3.4.3c)
19. Hartsville Fire Department (Ref-5.3.3.2c)
20. FirstHealth Emergency Medical Services (Ref-5.6.2.3)
21. Memorandum of Understanding between Progress Energy and the South Carolina Department of Health and Environmental Control (Ref-5.6.2.3)
22. Progress Energy Southern Region Engineering & Operations (Ref-5.6.2.3)
23. Progress Energy Hartsville Operations Center (Ref-5.5.4)
24. Darlington County Combustion Turbine Plant (Ref-5.4.4.2b)

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
OFFSITE AGENCY SUPPORT SUMMARY

	FUNCTION (NUREG-0654, II.A)	PRIMARY RESPONSIBILITY	SUPPORT RESPONSIBILITY
1.	Command and Control		
	a. Onsite	HBRSEP	NRC
	b. Offsite	State, County	FEMA, Progress Energy
2.	Accident Classification		
	a. Onsite	HBRSEP	NRC
	b. Offsite	N/A	N/A
3.	Warning		
	a. Onsite	HBRSEP	Local
	b. Offsite	County	State
4.	Notification		
	a. Onsite	HBRSEP	Local
	b. Offsite	HBRSEP	State, Local, Media
5.	Communications		
	a. Onsite	HBRSEP	NRC, Progress Energy
	b. Offsite	State, County	BellSouth, Progress Energy
6.	Transportation		
	a. Onsite	HBRSEP/Employees	Local
	b. Offsite	Local/Residents	FEMA, State, County
7.	Traffic Control Security		
	a. Onsite	HBRSEP Security	County
	b. Offsite	County	State
8.	Accident Assessment		
	a. Onsite	HBRSEP	HEEC, BNP, NRC, HNP, Washington Group Westinghouse
	b. Offsite	State	County, Progress Energy FEMA, EPA, DOE, CAP

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
OFFSITE AGENCY SUPPORT SUMMARY

	FUNCTION (NUREG-0654, II.A)	PRIMARY RESPONSIBILITY	SUPPORT RESPONSIBILITY
9.	Public Information/Education		
	a. Onsite	HBRSEP,Corp.Comm.	NRC
	b. Offsite	State	County, Corp. Comm., Media, FEMA
10.	Protective Response		
	a. Onsite	HBRSEP	County, Progress Energy
	b. Offsite	County, State	Progress Energy, FEMA, EPA USDA
11.	Radiological Exposure Control		
	a. Onsite	HBRSEP	Progress Energy, HNP, BNP
	b. Offsite	State	County, FEMA, EPA, Progress Energy
12.	Fire and Rescue		
	a. Onsite	HBRSEP	County/Local Organ.
	b. Offsite	County	State
13.	Medical		
	a. Onsite	HBRSEP	County/Local Organ.
	b. Offsite	Local	State, U.S. DHHS
14.	Public Health & Sanitation		
	a. Onsite	HBRSEP	State, Local, Progress Energy
	b. Offsite	County	State, FEMA, U.S. DHHS
15.	Social Services		
	a. Onsite	N/A	N/A
	b. Offsite	State	County, Red Cross, Salvation Army
16.	Training		
	a. Onsite	HBRSEP	Progress Energy, NRC
	b. Offsite	County	State, Progress Energy, HBRSEP

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
OFFSITE AGENCY SUPPORT SUMMARY

FUNCTION (NUREG-0654, II.A)	PRIMARY RESPONSIBILITY	SUPPORT RESPONSIBILITY
17. Exercises		
a. Onsite	HBRSEP	Progress Energy, NRC
b. Offsite	State	State, County, Progress Energy, HBRSEP
18. Recovery/Reentry		
a. Onsite	HBRSEP	Progress Energy, NRC
b. Offsite	State	Washington Group, Westinghouse, FEMA,
	Local	Progress Energy, DOE, EPA, U.S. DHHS, USDA

NOTE:		
	BNP	Brunswick Nuclear Plant
	CAP	Civil Air Patrol
	CORP. COMM	Progress Energy Corporate Communications
	DOE	U.S. Department of Energy
	EPA	U.S. Environmental Protection Agency
	FEMA	U.S. Federal Emergency Management Agency
	W	Westinghouse
	HBRSEP	H. B. Robinson Steam Electric Plant, Unit No. 2
	HEEC	Harris Energy & Environmental Center
	HNP	Harris Nuclear Plant
	NRC	U.S. Nuclear Regulatory Commission
	USDA	U.S. Department of Agriculture
	US DHHS	U.S. Department of Health & Human Services

ATTACHMENT 6.4
Page 1 of 2

DISTRIBUTION LISTS FOR PLAN AND PROCEDURES
HBRSEP PLANT OPERATING MANUAL

VOL. # 1, PART 2 TITLE: EMERGENCY PLAN

COPY #	ISSUED TO
1	325B - Procedure Control
2	Control Room
21	Training Library
72	E&RC Library
95	Unit 2 Hot Lab
118	Darlington County Civil Def. Dir.
119	Chesterfield County Civil Def. Dir.
120	Lee County Civil Def. Dir.
121	Hartsville Civil Def. Dir.
124	Emergency Preparedness Specialist
149	1100 Fish Hatchery Road West Columbia, SC SCEMD
151	408B-for 50.54(Q)
452	325A O&M Building Maintenance Library
678	Hartsville Operations Center, Railroad Avenue

DISTRIBUTION LISTS FOR PLAN AND PROCEDURES
HBRSEP PLANT OPERATING MANUAL

VOL. # 2, PART 5 TITLE: EMERGENCY PROCEDURES

COPY #	ISSUED TO
1	325B - Procedure Control
2	Control Room
21	Training Library
117	Operation Support Center
124	Emergency Preparedness Specialist
151	408B-for 50.54(Q)
595	JIC - Company Spokesperson
596	JIC - Director
597	JIC - Company Technical Spokesperson
598	JIC - Public Information Director
599	JIC - Administrative Coordinator
605	JIC Command Room
607	TSC Command Room
608	EOF Command Room
678	Hartsville Operations Center, Railroad Avenue

MEDICAL TREATMENT AND ASSISTANCE

E.1. INTRODUCTION

The Medical Treatment and Assistance Plan provides for several levels of treatment based on the severity of injury and degree of radioactive contamination involved, if any.

The first level of assistance will be given onsite in the plant First Aid Room. In this facility, initial evaluation of the severity of the injury will be made by personnel qualified as first responders, and emergency treatment started. In many cases, it may be possible to provide complete treatment at this location.

Concurrently, the degree of radiation exposure and/or contamination will be assessed by radiation safety personnel and decontamination begun. All injuries occurring in a contaminated area will be considered as contaminated until monitored and cleared.

If the severity of the injury requires more extensive or prolonged treatment, the patient can be transported to the second level of assistance located at the Carolina Pines Regional Medical Center where special facilities for treatment of contaminated patients have been provided (see Section E.2.2). Chesterfield General Hospital in Cheraw, S. C., provides a backup facility should Carolina Pines Regional Medical Center become full or uninhabitable.

When the level of radiation exposure (either external or internal) requires specialized evaluation and treatment, the patient can be transported to a third level of assistance. Examples are the North Carolina Memorial Hospital in Chapel Hill or The Radiation Emergency Assistance Center Training Site (REACTS) in Oak Ridge, Tennessee. Assistance from REACTS, as with other governmental agencies, may be requested through the State of South Carolina. REACTS will provide advice and assistance to HBRSEP in the event of a severe radiation accident.

Transfer from any level of assistance to the next higher level will be effected only after medical evaluation (unless the urgency of the patient's condition requires immediate action) and will be under the control of the attending physician or the alternate senior physician.

E.2. Medical Emergencies

E.2.1 Onsite First Aid Facilities

It is anticipated that contaminated personnel will not leave the facility for medical treatment except for cases thought to require immediate hospitalization. Emergency medical treatment of contaminated personnel will be handled on site by personnel qualified as first responders. This includes all injuries thought not to require immediate hospitalization.

MEDICAL TREATMENT AND ASSISTANCE

E.2.2 Hospitalization

If emergency medical treatment can best be given at Carolina Pines Regional Medical Center in Hartsville (or another facility as may be advised by a competent medical authority), the injured person may be transported to Carolina Pines Regional Medical Center. Good health physics practices will be followed to prevent the spread of radioactive contamination to offsite areas and facilities. If possible, contaminated clothing and equipment should be removed, or the patient should be wrapped in clean sheets or clothing to prevent contamination of the transporting personnel and vehicle.

Medical assistance is immediately available in the Hartsville area from a group of physicians, who are on the staff of Carolina Pines Regional Medical Center, and who have agreed to provide medical assistance for contaminated patients. In addition, Chesterfield General Hospital in Cheraw, S. C., provides back-up services. Also, the U. S. Department of Energy Radiological Assistance Team will provide medical assistance, if required, through their REACTS facility in Oak Ridge, Tennessee.

E.2.3 Treatment Facility

A specially designated emergency area is maintained in readiness at Carolina Pines Regional Medical Center and Chesterfield General Hospital for Progress Energy's use for the treatment of contaminated patients. Although this area will be utilized by the hospital when not required by Progress Energy, it will be made immediately available to Progress Energy when required. Equipment is available in the hospital for the emergency treatment of patients. With the facilities and equipment available, extensive decontamination and treatment of an injured patient could be performed, including surgical treatment that may be required.

E.2.4 Onsite Medical Services

On site personnel qualified as first responders will provide initial medical treatment.

MEDICAL TREATMENT AND ASSISTANCE

E.2.5 Emergency Equipment

An emergency kit is maintained at Carolina Pines Regional Medical Center and at Chesterfield General Hospital containing supplies and equipment for personnel monitoring and the control of radioactive contamination. This kit contains the following:

a. Radiation monitoring instruments, one low-level instrument for determining contamination levels, and one intermediate-range instrument for determining dose rates.

b. Personnel monitoring equipment such as TLDs and self-reading dosimeters.

c. Decontamination equipment and supplies for both personnel and facility.

d. Contamination control equipment and supplies such as protective clothing, signs, ropes, tags, plastic bags, etc.

E.2.6 Ambulance Service

The Lake Robinson Rescue Squad, and Darlington Emergency Medical Service have agreed to respond to all emergency calls from the plant, just as they respond to other calls from the Hartsville area.

TECHNICAL BASIS OF EMERGENCY DOSE PROJECTION PROGRAM

I. Background

When a potential or actual unanticipated release of radioactive material occurs which meets the initiating condition of the Dose Assessment Procedures, a dose assessment is performed. Initially, prior to activation of the Emergency Operations Facility, the Control Room staff is responsible for performing dose assessments. Once the Emergency Operations Facility is activated, the radiological control staff assumes responsibility for dose assessments. These dose assessments are used to classify emergencies, formulate follow-up protective action recommendations to the State and Counties, and to characterize the overall health risk to the public of any releases. The methodology for dose assessments is based upon the referenced documents at the end of this discussion. The methods, assumptions and equations used to estimate projected doses are presented herein.

The exposure to the public during an airborne release (early phase) is via direct exposure to an overhead plume or immersion in a radioactive plume, direct exposure from deposited radioactive materials, and the committed dose to internal organs from inhalation of radioactive materials. These doses are expressed in terms of Total Effective Dose Equivalent, which is the sum of external exposure doses from the plume and deposited materials and the internal dose commitment from intake of radioactive materials, and Committed Dose Equivalents to the critical organ (Thyroid), which is the radiation dose due to radionuclides in the thyroid over a fifty year period following intake.

The fundamental equation used to estimate projected dose is

$D = X/Q \bullet Q \bullet DCF$ [Reference 1]

Where:

D = Dose in Rem [TEDE or CDE]

X/Q = Atmospheric Dispersion Coefficient in Sec./M^3

Q = Radioactive Source Term in Curies

DCF = Dose Conversion Factor in (Rem - M^3) / (Ci - Sec.)

As shown, three components are required to project the dose to the public. The first factor, X/Q, is derived from data obtained from the plant's meteorological tower. The parameters of wind speed wind direction, and differential temperature are measured by instruments on the tower and are used in the Gaussian diffusion model [References 2 & 3] to derive the X/Q factor.

The second parts of the equation, Q, or source term, is determined from plant effluent monitor reading(s), from analysis of a sample of effluent gas or water, from selection of a default accident category, or from a manual method of analysis.

The last part of the equation, DCF, or dose conversion factor, is taken from the EPA "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" [Reference 4].

Implicit in the dose equation are input variables such as estimated duration of release and distances from the release point to points of interest.

II. Source Term

A. Background

Since 1962, source term mixes for nuclear power plants have been derived from TID-14844 [Reference 5]. This report established what was believed to be a bounding case for release of radionuclides in a severe core damage accident. The release consisted of 100% of the core inventory of noble gases, 50% of the core inventory of iodines, and 1% of the core inventory of particulates. Since that time the use of probabilistic risk assessments in examining accident consequences has been developed and has culminated in the NRC report NUREG-1465, "Accident Source Terms for Light Water Nuclear Power Plants" [Reference 6]. In this document, new source terms were proposed that utilized the risk assessments of five typical PWRs and five BWRs to develop a mean in-containment isotopic release fraction for various core damage events.

In any risk assessment study, a large number of accident sequences and their probabilities of occurrence are analyzed. A separate isotopic release fraction is developed for each accident sequence. The major isotopic release factions are those fractions of core inventory that are released either through failure of the fuel cladding, melting of the core within the reactor vessel, or release of melted core materials through a breach of the reactor vessel. These fractions are values that when multiplied by the core inventory in curies of the particular isotopes, give curie amounts of isotopes immediately available for release from the containment. The effects of cleanup and engineered safety features are taken to the extent consistent with the failures that led to the particular accident sequence. To make the results manageable, the accident sequences and the accident isotopic releases are grouped. NUREG-1465 then uses the accident sequence probabilities as a means to weigh the release fractions for that sequence category. The weighted release fractions are added up to determine a "mean" in-containment release fraction.

The Progress Energy Risk Assessment Unit is responsible for the development of the Individual Plant Examinations (IPEs), or risk assessment studies, for all three plants. These studies factor in the status of the containment and cleanup systems to determine a release source term directly to the environment. The studies do not normally report the "in-containment" source term nor do they develop a mean value. The computer code for the study was rerun with new outputs to determine the in-containment release fractions for each accident sequence. The probabilities of the accident sequences were used to weight the release fractions to develop plant specific mean in-containment release fractions similar to NUREG-1465.

B. Source Term Categories

The traditional source term categories used in the industry were based on TID-14844 and utilized the major accidents analyzed in the FSAR, e.g, LOCA, etc. The source term based on TID-14844 was in fact a default mix of isotopes that was acted upon by the available engineering safety features and natural phenomena associated with each analyzed accident.

The new source terms are based upon the core melt sequences developed by the methodologies used in risk assessment studies. These sequences look at four categories of core damage: 1) fuel clad failure, 2) in-vessel melting, 3) ex-vessel release through a breach of the vessel by melted fuel, and 4) a late in-vessel melting category. These categories have an associated release duration based upon the length of time that the core is uncovered. As a result, it is possible to construct a source term matrix that is dependent on two parameters, whether or not the fuel is uncovered, and the length of time that the fuel is uncovered.

In order to have a dose assessment capability that can be utilized under many circumstances, the vast majority of which are less consequential than a total melt of the core with no removal mechanisms, the effect of engineered safety features and removal phenomena must be included in the source term mix. A review of all the removal effects as listed in RTM-96 [Reference 7] was performed and a simplified removal fraction was selected to capture all of the accident categories regardless of how many mitigating processes are in effect.

The "default" condition for selecting a source term mix is to use a mix that takes into account removal mechanisms for particulates and iodines. Only if no removal process, e.g., sprays, filtration, partitioning, is available will the unmitigated source terms be used.

In order to select the proper mix, the release pathway and estimated time duration of core uncovery will be determined. The response to the release pathway questions and core uncovery time should result in the selection of one of eight possible accident source term mixes as shown on the last page of this attachment. The last in-vessel melt release fractions in the risk assessment studies are approximately one order of magnitude below the early in-vessel values, so no separate category of source terms were developed for that case.

As a special case, aged spent fuel involved in shipments and long term storage have a single isotopic inventory for the gap which consists of long lived isotopes. This inventory will be used as a single case for determination of a source term for dose assessment purposes.

Similarly, the maximum expected inventory of a waste gas decay tank will be used as a single mix category (with no decay) for the PWRs.

For specific details refer to calculation RNP-M/MECH-1742 [Reference 9].

C. Radioisotope Inventories and Assumptions

The set of radionuclides included in the mixes were taken from RTM-96 [Reference 7].

The core inventories for HBRSEP were developed using the ORIGEN-S code assuming end of cycle conditions, a burnup of 60,000 MWD/MTU, a mixed core consisting of low enriched fuel, PLSAs, and high enriched fuel. For details refer to calculation RNP-M/FHB-1000 [Reference 10]. To be consistent with RTM-96, only 38 isotopes were used. For isotopic core inventory consult calculation RNP-M/MECH-1742 [Reference 9].

The aged spent fuel assembly source term was developed by taking the values for Kr^{85}, and I^{129} from the ORIGEN code run, decaying the values for 5 years, and then taking release fractions as stated in Regulatory Guide 1.25 (30%) [Reference 8].

The Waste Gas Decay Tank mix for HBRSEP is taken from Technical Specifications.

D. Development of Source Terms Based on Default Accident Categories

In the absence of better information, such as an effluent monitor reading or an effluent sample, a dose projection can be performed simply by specifying the accident category as a default. The selection of a default accident category defines the mix, the total curies, and the release pathway(s). The total number of curies from the default mix for each isotope is used to provide an upper bound for Q, and hence, an upper bound for the dose to the public.

TECHNICAL BASIS OF EMERGENCY DOSE PROJECTION PROGRAM

E. Development of Source Terms Based on Effluent Monitor Readings

Radiation monitors in effluent streams or other release pathways are used to define a release activity based on the sensitivity of the monitor to the particular radionuclide mix. The effect of radioactive decay in changing the mix of isotopes is taken into account up to a maximum decay from time of reactor shutdown of 32 hours. Two types of monitors are used, effluent monitors and other radiation monitors.

Effluent monitors are calibrated to a reference Xe-133 or Kr-85 standard and are sensitive to both betas and gammas. The sensitivity of the monitor varies with the energy of the betas and gammas detected, and this sensitivity curve is used to develop an accident specific sensitivity for the monitor which is converted to a Xe-133 or Kr-85 equivalent. The radionuclide mix for each accident category is thus converted into a multiplication factor for the calibrated detector sensitivity. This modified sensitivity is then multiplied by the process flow to provide a curies/second source term for each radionuclide present. The estimated duration of release, based on an assessment of the accident duration, is multiplied by the curies/second to derive a total curie release for each isotope.

Radiation monitors that are not a part of effluent streams utilize a detector sensitive only to gammas. These monitors also have a sensitivity that varies with the energy of the gamma. The radionuclide mixes are modeled with the detector geometry to develop an accident specific sensitivity. The radionuclide mix for each accident category is thus converted into a multiplication factor for the calibrated detector sensitivity. This modified sensitivity is then multiplied by the process flow to provide a curies/second source term for each radionuclide present. The estimated duration of release, based on an assessment of the accident duration, is multiplied by the curies/second to derive a total curie release for each isotope.

For specific details refer to calculation RNP-M/MECH-1746 [reference 11].

F. Development of Source Terms Based on Effluent Samples

Effluent samples, when analyzed, will provide a decay corrected activity from time to reactor shutdown expressed in terms of μCi/cc for each isotope. These values are then multiplied by the process flow to provide a curies/second source term for each radionuclide present. The estimated duration of release, based on an assessment of the accident duration, is multiplied by the curies/second to derive a total curie release for each isotope.

G. Development of Source Terms by Manual Method

There may be occasions where "what-if" calculations may be necessary in the decision making process. The dose projection procedure will allow the input of a direct curie value for each isotope in the source term.

TECHNICAL BASIS OF EMERGENCY DOSE PROJECTION PROGRAM

III. Atmospheric Dispersion

The model used to predict the reduction in concentration of radionuclides as a function of meteorological conditions and distance is the Gaussian Plume Model using the Pasquill Dispersion Model [References 2 & 3].

Two meteorological parameters are needed to compute the atmospheric dispersion factor X/Q. They are wind speed and the stability class as determined by the differential air temperature as a function of height above ground level. These three parameters can be obtained in one of four ways:

1. The plant computer polls the meteorological tower data acquisition system every 15 minutes and reports the most recently obtained data.
2. A personal computer can dial the meteorological tower data acquisition system and obtain current data.
3. The National Weather Service can be contacted to provide information which can be used to derive the required parameters.
4. As a last resort, a visual scan of the surrounding skies can be used with information from Reference 2 to choose the approximate parameters.

The differential temperature as a function of height above ground level at the meteorological tower is used to determine the Pasquill stability class as A through G, where A is the most unstable atmosphere and G is the most stable. The X/Q value is calculated as a function of wind speed, stability class, and distance from the plant. The dose projection program calculates shine dose to the ground from an overhead plume in addition to the immersion dose from the plume. This calculation uses EPA 400 dose conversion factors.

IV. Dose Conversion Factors

Dose Conversion Factors for each isotope in the source term are taken entirely from the EPA "Manual of Protective Action Guidelines and Protective Actions from Nuclear Incidents" [Reference 4]. The EPA assumptions on particle size, deposition velocity, the presence of daughter products of decay, and exposure duration incorporated into the Dose Conversion Factors are also incorporated into the dose assessment model by reference.

To determine the Total Effective Dose Equivalent, the DCFs from Table 5-1 in Reference 4 are multiplied by the individual source term curies for each isotope, times the X/Q. The result is a TEDE for each isotope. The TEDE doses of all the isotopes are summed to provide a Total Effective Dose Equivalent in the dose projection results.

To determine the Committed Dose Equivalent to the thyroid, the DCFs from Table 5-1 in Reference 4 are multiplied by the individual source term curies for each iodine isotope, times the X/Q. The result is a 50 year committed dose equivalent to the thyroid for each isotope. The CDE doses are summed to provide a total thyroid CDE in the dose projection results.

V. Assumptions and Limitations

A. Source Terms

Core burnup was assumed to be an average end-of life composed of the latest fuel manufacture.

The radionuclide mix was taken as a representative sample of noble gas, halogen, and particulate isotopes with short, medium, and long term decay constants, of high quantity production, with some isotopes having high DCFs. The selection of isotopes is consistent with Reference 7.

The noble gas source term will be reported as Xenon-133 equivalent.

The radioiodine source term will be reported as Iodine-131 equivalent.

Source terms are decayed from reactor shutdown (where values are assumed at equilibrium) to the time of release into the environment. The decay affects the mix of isotopes. Radioactive decay during plume passage will not be calculated.

B. Atmospheric Dispersion

The X/Q values are based on data obtained from one meteorological tower site near the plant, and the information is assumed to be representative of the release point.

C. Dose Conversion Factors

Deposition velocity is assumed to be 1 cm/sec. for radioiodines and 0.1 cm/sec. for all other isotopes subject to deposition.

The duration of exposure to deposition will be four days.

The adult thyroid dose conversion factors are from Table 5-2 of Reference 4, and assume a breathing rate of 1.2×10^6 cm^3 per hour.

The Effective Dose Equivalent is not added to the thyroid Committed Dose Equivalent.

References:

1. Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, U. S. Nuclear Regulatory Commission, Washington, D.C., October 1975.

2. Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accidents Consequence Assessments at Nuclear Power Plants," U. S. Nuclear Regulatory Commission, Washington, D. C., August 1979.

3. "Workbook of Atmospheric Dispersion Estimates," D. Bruce Turner, U. S. Environmental Protection Agency, Washington, D. C., 1970.

4. EPA-400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," U. S. Environmental Protection Agency, Washington, D. C., May 1992.

5. Technical Information Document (TID)-14844, Calculation of Distance Factors for Power and Test Reactor Sites," J. J. DiNunno et al, U. S. Atomic Energy Commission, Washington, D. C., 1962.

6. NUREG-1465, "Accident Source Terms for Light Water Nuclear Power Plants," Draft Report for Comment, U. S. Nuclear Regulatory Commission, Washington, D. C., June 1992.

7. NUREG/BR0150, RTM-96, "Response Technical Manual," Vol. 1, Rev. 4, U. S. Nuclear Regulatory Commission, Washington, D. C.

8. Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," U. S. Nuclear Regulatory Commission, Washington, D. C., March 1972.

9. Calculation RNP-M/MECH-1742, Design Inputs for Emergency Plan Dose Assessment, Source Term, Rad Monitor Information.

10. Calculation RNP-M/FHB-1000, Alternate Source Terms per Regulatory Guide 1.183 for Accident Analysis.

11. Calculation RNP-M/MECH-1746, Calculation of Inputs for Dose Projection Software.

TECHNICAL BASIS OF EMERGENCY DOSE PROJECTION PROGRAM

Source Term Category:	Description
Normal RCS	Accidents that do not result in core uncovery.
Gap Release With Cleanup	Any accident sequence that results in core uncovery < 30 minutes, or mechanical fuel damage has occurred. Filtration, partitioning, and/or containment sprays are considered to be effective.
Gap Release No Cleanup	Any accident sequence that results in core uncovery < 30 minutes or mechanical fuel damage has occurred. Filtration, partitioning, and/or containment sprays are considered to be NOT effective.
Early In Vessel With Cleanup	Any accident sequence that results in core uncovery from 0.5 to 1.8 hours. Filtration, partitioning, and/or containment sprays are considered to be effective.
Early In Vessel No Cleanup	Any accident sequence that results in core uncovery from 0.5 to 1.8 hours. Filtration, partitioning, and/or containment sprays are considered to be NOT effective.
Ex-Vessel With Cleanup	Any accident sequence that results in core uncovery >1.8 hours. Filtration, partitioning, and/or containment sprays are considered to be effective.
Ex-Vessel No Cleanup	Any accident sequence that results in core uncovery >1.8 hours. Filtration, partitioning, and/or containment sprays are considered to be NOT effective.
Spent Fuel With Cleanup	An Accident involving the damage of a freshly unloaded spent fuel assembly. Filtration is considered to be effective. For spent fuel assembly accidents with no filtration, use "Gap Release No Cleanup."

PROCEDURES REQUIRED TO IMPLEMENT SECTIONS OF THE PLAN

PLAN		PROCEDURES	
Section 5.1:	Introduction	N/A	
Section 5.2:	Emergency Classifications	EPCLA-00	Emergency Classifications and Protective Action Recommendations
Section 5.3:	Emergency Response Organization	EPNOT-00	Notification and Emergency Communications
		EPTSC-00	Activation and Operation of the Technical Support Center
		EPEOF-00	Activation and Operation of the Emergency Operations Facility
		EPJIC-00	Activation and Operation of the Joint Information Center
		EPOSC-00	Activation and Operation of the Operational Support Center
		Volume 3	Fire Protection Manual
Section 5.4:	Emergency Measures	EPCLA-00	Emergency Classification and Protection Action Recommendations
		EPNOT-00	Notification and Emergency Communications
		EPSPA-00	Site Protective Actions
		EPRAD-00	Radiological Assessment and Consequences
		EPOSC-00	Activation and Operation of the Operational Support Center
		EPTSC-00	Activation and Operation of the Technical Support Center
		HPS-NGGC-0013	Personnel Contamination Monitoring, Decontamination, and Reporting

PROCEDURES REQUIRED TO IMPLEMENT SECTIONS OF THE PLAN

PLAN		PROCEDURES	
Section 5.5:	Emergency Facilities and Equipment	EPTSC-00	Activation and Operation of the Technical Support Center
		EPEOF-00	Activation and Operation of the Emergency Operations Facility
		EPOSC-00	Activation and Operation of the Operational Support Center
		EPJIC-00	Activation and Operation of the Joint Information Center
		EPRAD-00	Radiological Assessment and Consequences
		RST-003	Emergency Kit Inventory
Section 5.6:	Maintaining Emergency Preparedness	EPPRO-00	Emergency Preparedness Program and Testing
Section 5.7:	Recovery	EPNOT-00	Notification and Emergency Communications
		EPEOF-00	Activation and Operation of the Emergency Operations Facility

CROSS-REFERENCE BETWEEN NUREG-0654 EVALUATION CRITERIA AND THE ROBINSON EMERGENCY PLAN

NUREG-0654 CRITERION	HBRSEP SECTION(s)
A.1.a	5.3.3.1, 5.3.3.1.5, 5.3.4, ATTACHMENT 6.3
A.1.b	5.3.0, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5
A.1.c	Figures 5.3.1-1, 5.3.2-1, 5.3.5-1 to 5.3.5-6
A.1.d	5.3.0, 5.3.2.1, 5.3.2.2.1
A.1.e	5.3.4, 5.3.5
A.2.a	Onsite: 5.3.2, Offsite: 5.3.3, 5.3.4 ATTACHMENT 6.3
A.2.b	N/A
A.3	ATTACHMENT 6.2
A.4	5.3.2.1.1, 5.3.2.2.1, 5.3.2.2.2
B.1	5.3.0, 5.3.1, 5.3.2
B.2	5.3.0, 5.3.2.1.1
B.3	5.3.2.1.1
B.4	5.3.2.1.1
B.5	5.3.0, 5.3.1, 5.3.2, Table 5.3.2-1
B.6	5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.5.0, 5.5.2, 5.5.3, 5.5.5, ATTACHMENT 6.3 (see also A.1.c above)
B.7	5.3.0, 5.3.1, 5.3., Table 5.3.2-1
B.7.a	5.3.2.2.2, 5.7.2.6
B.7.b	5.7.2.3, 5.7.2.4
B.7.c	5.3.2.1.1, 5.3.2.1.5, 5.3.2.2, 5.3.3.1
B.7.d	5.3.3.1
B.8	5.3.3.1.5
B.9	5.3.3.4, ATTACHMENT 6.2, ATTACHMENT 6.3, ATTACHMENT 6.5
C.1.a	5.3.4.5.1, ATTACHMENT 6.2
C.1.b	5.3.4.5.1, ATTACHMENT 6.2
C.1.c	5.3.4.5, ATTACHMENT 6.2
C.2.a	N/A
C.2.b	5.3.2.1.5
C.3	5.5.7.6, ATTACHMENT 6.3
C.4	5.3.3, 5.3.4, ATTACHMENT 6.2, ATTACHMENT 6.3
D.1	5.2, ATTACHMENT 6.9
D.2	5.2, ATTACHMENT 6.9
D.3	N/A
D.4	N/A

CROSS-REFERENCE BETWEEN NUREG-0654 EVALUATION CRITERIA AND THE ROBINSON EMERGENCY PLAN

NUREG-0654 CRITERION	HBRSEP SECTION(s)
E.1	5.3.5, 5.4.1, 5.4.4.1, Procedures
E.2	5.3.2, 5.3.3, 5.3.4, 5.3.5, Procedures
E.3	5.3.5
E.4.a-n	Procedure EPCLA-00
E.5	N/A
E.6	5.3.5, 5.4.4.7
E.7	5.3.5, 5.4.4.7
F.1.a	5.3.1, 5.3.5, EPNOT-00
F.1.b	5.3.5, ATTACHMENT 6.1
F.1.c	5.3.5, ATTACHMENT 6.1
F.1.d	5.3.5, ATTACHMENT 6.1
F.1.e	5.3.5, 5.3.2.2.2, EPCLA-00, EPNOT-00
F.1.f	5.3,5, ATTACHMENT 6.1, Procedures
F.2	ATTACHMENT 6.1, Table 5.3.5-1
F.3	5.6.1.2.1, 5.6.1.2.2
G.1	5.4.4.7.1, 5.6.1.4
G.2	5.4.4.7.1, 5.6.1.4
G.3.a	5.3.3.1, 5.5.5
G.3.b	5.5.4, 5.5.5
G.4.a	5.3.3.1
G.4.b	5.3.3.1
G.4.c	5.3.3.1, 5.4.4.7.1
G.5	5.6.1.4
H.1	5.5.2, 5.5.3
H.2	5.5.4
H.3	N/A
H.4	5.5.3.0, 5.3.1, 5.3.2, 5.3.3, 5.3.5 Table 5.3.5-1, Procedures
H.5	5.5.7
H.5.a	5.5.7
H.5.b	5.5.7.4
H.5.c	5.5.7.5
H.5.d	5.5.8
H.6.a	5.5.7
H.6.b	5.5.7
H.6.c	5.5.7.6
H.7	5.5.7.4, 5.5.12

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NUREG-0654 CRITERION	HBRSEP SECTION(s)
H.8	5.5.7.2
H.9	5.5.3, Table 5.5.0-1
H.10	5.6.3.1
H.11	5.5.9, Procedures
H.12	5.4.2.3, 5.5.0, 5.5.2, 5.5.4, Table 5.5.0-1
I.1	POM VOL. 3 PARTS 4 & 5, EPs
I.2	5.4.2 **{RNP RA/01-0164; NRC Amendment No. 192}**
I.3.a	5.4.2.2
I.3.b	5.4.2.2
I.4	5.4.2.2, 5.4.2.3, ATTACHMENT 6.6
I.5	5.5.7.2, ATTACHMENT 6.4
I.6	5.4.2.1
I.7	5.4.2.4
I.8	5.3.2.5.1, 5.4.2.3, 5.4.2.4, 5.5.6.3
I.9	5.4.2, Procedures
I.10	5.4.2, Procedures
J.1.a	5.4.4.2, 5.6.1.1, ATTACHMENT 6.1, Procedures
J.1.b	5.4.4.2, 5.6.1.1, ATTACHMENT 6.1, Procedures
J.1.c	5.4.4.2, 5.6.1.1, Procedures
J.1.d	5.4.4.2, 5.4.4.6, Procedures
J.2	5.4.4.2, Procedures
J.3	5.3.2.5.3, 5.4.4.2.2, 5.4.4.4.1
J.4	5.3.2.5.3, 5.4.4.2.2
J.5	5.3.2.1.7, 5.4.4.2.2
J.6.a	5.4.4.3, 5.5.1, 5.6.3.1, EPPRO-02
J.6.b	5.4.4.3, 5.5.1, 5.6.3.1, EPPRO-02
J.6.c	5.4.4.3, 5.4.4.5
J.7	5.4.4, 5.4.4.2.2, 5.4.1.1, 5.4.4.6 ATTACHMENT 6.4 Figure 5.4.4-2
J.8	5.4.4.7.3
J.9	N/A
J.10.a	5.4.4.7.3, Figures 5.1.1-2
J.10.b	Figures 5.1.1-2, 5.1.1-6
J.10.c	5.3.5, 5.4.4.6
J.10.d	N/A
J.10.e	N/A
J.10.f	N/A
J.10.g	N/A

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NUREG-0654 CRITERION	HBRSEP SECTION(s)
J.10.h	N/A
J.10.i	N/A
J.10.j	N/A
J.10.k	N/A
J.10.l	N/A
J.10.m	See item J.7, Table 5.4.4-2
J.11	N/A
J.12	N/A
K.1.a-g	5.4.4.3
K.2	5.4.4.3
K.3.a	5.4.4.3
K.3.b	5.4.4.3
K.4	N/A
K.5.a	5.4.4.4, Procedures
K.5.b	5.4.4.4, 5.4.4.5
K.6.a	5.4.4.4
K.6.b	5.4.4.4, Procedures
K.6.c	5.4.4.4, Procedures, 5.7.4
K.7	5.4.4.4, 5.4.4.5
L.1	5.3.3.4.1, 5.3.3.4.2, 5.4.4.5, ATTACHMENT 6.2, 5.5.10 ATTACHMENT 6.5
L.2	5.3.3.4.1, 5.3.3.4.2, 5.4.4.5, 5.5.10, ATTACHMENT 6.2, ATTACHMENT 6.5
L.3	N/A
L.4	5.3.3.4.1, 5.3.3.4.2, 5.4.4.5, ATTACHMENT 6.2, ATTACHMENT 6.5
M.1	5.4.4.3, 5.4.4.3.2, 5.7.3, 5.7.4, 5.4.4.3.1 5.7, Procedures
M.2	5.7.2, Figure 5.7.2-1
M.3	5.7.2, ATTACHMENT 6.1, Procedures
M.4	5.4.2.3
N.1.a	5.6.1.2.2
N.1.b	5.6.1.2.2
N.2.a	5.6.1.2.1
N.2.b	5.6.1.2.1
N.2.c	5.6.1.2.1
N.2.d	5.6.1.2.1
N.2.e	5.6.1.2.1

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NUREG-0654 CRITERION	HBRSEP SECTION(s)
N.3.a	5.6.1.2
N.4	5.6.1.2.2
N.5	5.6.1.2.2
O.1	5.6.1.1
O.1.a	5.6.1.1
O.1.b	N/A
O.2	5.6.1.2.1
0.3	5.6.1.1,EPPRO-03
O.4.a	5.6.1.1, EPPRO-03
O.4.b	5.6.1.1, EPPRO-03
O.4.c	5.6.1.1, EPPRO-03
O.4.d	5.6.1.1
O.4.e	5.6.1.1
O.4.f	5.6.1.1, EPPRO-03
O.4.g	5.6.1.1
O.4.h	5.6.1.1
O.4.i	5.6.1.1
O.4.j	5.6.1.1
O.5	5.6.0, 5.6.1, 5.6.1.1
P.1	5.6.1.1, 5.6.1.3
P.2	5.6.1.3
P.3	5.6.1.3
P.4	5.6.2, ATTACHMENT 6.2
P.5	5.6.2.1, ATTACHMENT 6.4
P.6	5.6.2.3
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P.9	5.6.2, 5.6.2.1, 5.6.2.2
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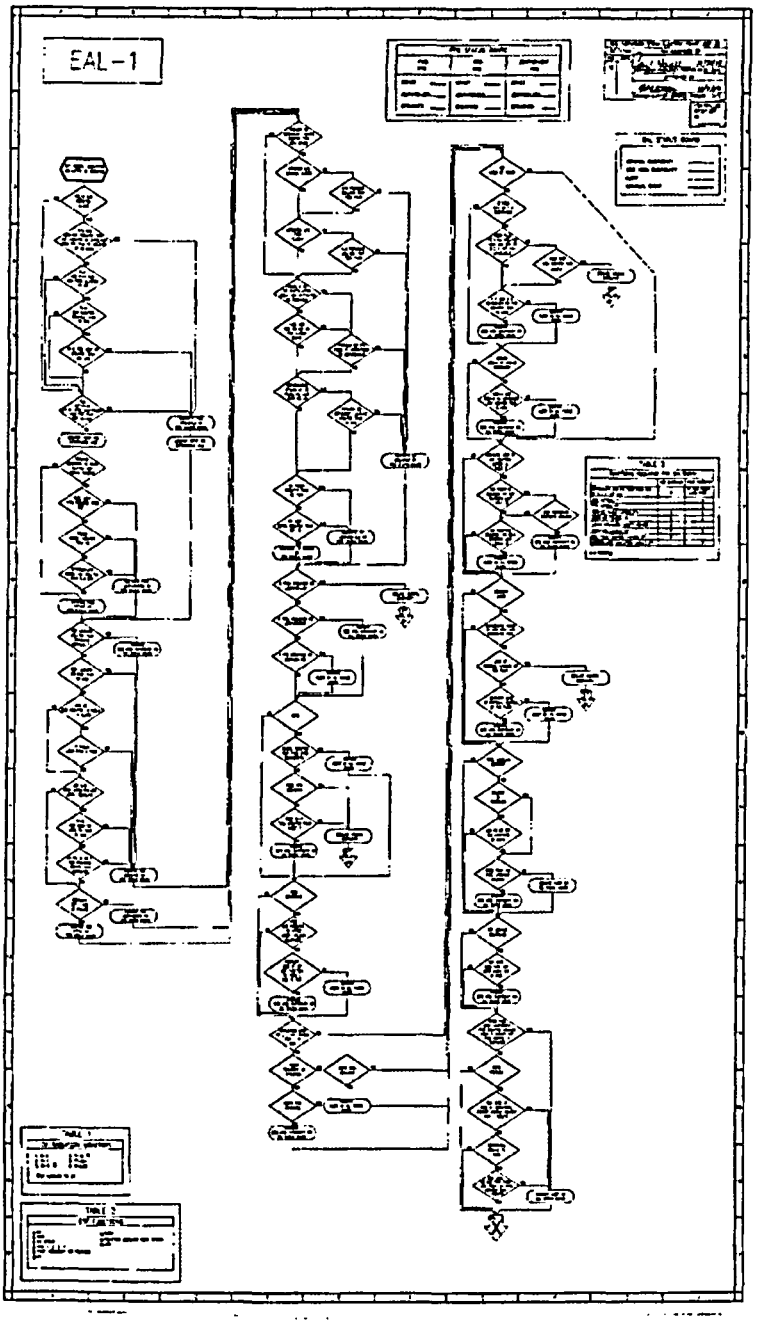
EMERGENCY ACTION LEVELS (EAL-1)



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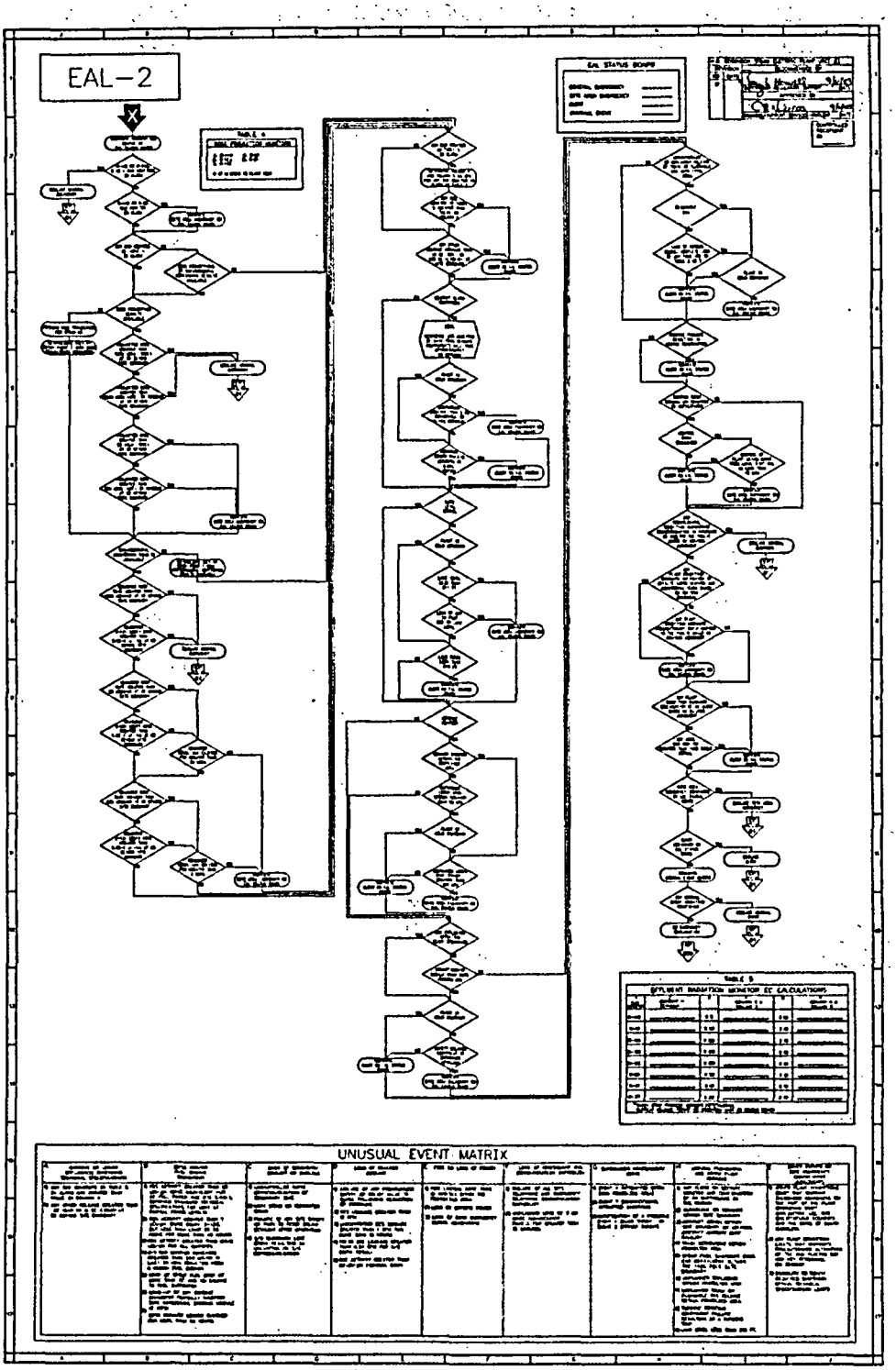
EMERGENCY ACTION LEVELS (EAL-2)



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