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Enclosure 3

Copies of Revised Procedures



Progress Energy

BRUNSWICK NUCLEAR PLANT

I
Information
Use

PLANT OPERATING MANUAL

VOLUME XIII

EMERGENCY RESPONSE PLAN

(0ERP)

***RADIOLOGICAL EMERGENCY RESPONSE PLAN
(ERP)***

REVISION 63

0ERP

Rev 63

REVISION SUMMARY

Revision 63 of OERP includes the following changes:

- Changed "Carolina Power & Light Company" to "Progress Energy" in Section 1.0 header to reflect company name change.
- Revised Section 4.2.1 and Appendix F, Technical Basis for Source Term Mixes, to reflect dose projection software change from CPLDOSE to RASCAL.
- Changed annual safety information "calendar" to annual safety information "brochure" and deleted "map" from safety information brochure reference in Section 4.4.7.1.
- Deleted Unit 1 and Unit 2 Turbine West and East Moisture Separator Drain Tank information from Table 5.7.2, Area Radiation Monitoring System Channel Identification & Meter Ranges, due to decommissioning of monitors in those locations.
- Deleted Table 7.2-1, Designation of Key Recovery Organization Personnel, and description of table in Section 7.2.
- Revised letters of agreement for Yaupon Beach Fire Department, Boiling Spring Lakes Fire Department, and New Hanover Regional Medical Center in Appendix B, Agreements, based on administrative changes. Also added letters of agreement with Brunswick Community College and Brunswick County Emergency Management.

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PROGRESS ENERGY
BRUNSWICK NUCLEAR PLANT (BNP)
RADIOLOGICAL EMERGENCY PLAN (ERP)

1.0 INTRODUCTION

The Emergency Program for the Brunswick Nuclear Plant consists of the Brunswick Radiological Emergency Plan and its implementing Plant Emergency Procedures. The Radiological Emergency Plan may also be referred to as the Emergency Response Plan (ERP) in other plant documents. Also included are the related radiological emergency plans and procedures of state and local organizations. The purpose of these programs is to provide for the protection of plant personnel and the general public and to prevent or mitigate property damage that could result from an emergency at the Brunswick Nuclear Plant. 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 on site and off site.
4. Effective and timely implementation of emergency measures.
5. Continued maintenance of an adequate state of emergency preparedness. The Supervisor - Emergency Preparedness is the BNP Emergency Planning Coordinator. The BNP Emergency Plan and Procedures are contained in the Plant Operating Manual (POM), Volume 13, which consists of the following parts:

Book 1, Radiological Emergency Plan (ERP)
Book 2, Plant Emergency Procedures (PEP)

A list of procedures required to implement the plan can be found in Book 2.

1.1 GENERAL INFORMATION

1.1.1 Plant Site Description

The Brunswick plant site is located in the southeastern portion of North Carolina 2 1/2 miles north of Southport in Brunswick County, and 16 miles south of Wilmington, North Carolina, in adjacent New Hanover County. (See Fig. 1.1-1 and Fig. 1.1-2.) Approximate coordinates of the reactor buildings are latitude 33° 57'30" N and longitude 78° 00'30" W. The Brunswick Plant utilizes two General Electric Company boiling water reactors. The major structures of the Brunswick plant which contain radioactive materials are the Units 1 and 2 reactor buildings, the turbine building and radwaste building.

Figure 1.1-1 shows a site plan for the Brunswick plant and Figure 1.1-3 shows the location of the buildings at the site.

1.1.2 Plume Exposure Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) is defined to be the area within an approximate ten-mile radius of the Brunswick plant.

Principal exposure sources from plume exposure pathways are: (a) external exposure to gamma and beta radiation from the plume and deposited material and (b) exposure of internal organs to gamma and beta radiation from inhaled radioactive gases and/or radioactive particulates.

Figure 1.1-2 shows the ten-mile plume exposure EPZ in relation to the location of the Brunswick plant. The plume exposure EPZ includes portions of the North Carolina counties of Brunswick and New Hanover.

The prevailing winds around the Brunswick plant are from the southwest. Figure 1.1-4 presents wind roses for the Brunswick plant site.

1.1.3 Ingestion Exposure Emergency Planning Zone

The ingestion exposure EPZ is defined to be the area within a 50-mile radius of the Brunswick plant.

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

Figure 1.1-5 shows the 50-mile ingestion exposure EPZ in relation to the location of the Brunswick plant. The ingestion exposure EPZ includes the North Carolina Counties of Bladen, Brunswick, Columbus, New Hanover, Onslow, Pender, and Sampson, and the South Carolina County of Horry.

The region within a 50-mile radius of the Brunswick plant site is predominantly rural, with less than one-half the land devoted to farming. The remainder of the region consists of undeveloped, non-utilized marshes and woodlands.

1.1.4 Demographic Information

Demographic information for the 10-mile Emergency Planning Zone is presented in Figure 1.1-6.

The information is presented by (1) local planning zones and (2) distance from plant at 0-2 miles, 2-5 miles, and 5-10 miles, based on the longitude and latitude of the plant site. Since some of the local planning zones extend beyond the 10-mile radius, the total population for the local planning zones is greater than the total population for the 0-10 mile radius.

1.2 SCOPE AND APPLICABILITY

This document describes the Brunswick Radiological 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 2.0 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 accidents having substantial on-site and/or off-site 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 Brunswick plant are summarized in Appendix C and in the state's Emergency Plan.

1.3 SUMMARY OF EMERGENCY PROGRAM

The Brunswick radiological emergency program consists of the Brunswick Radiological 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. The Brunswick plant 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.

1.3.1 Concept of Operations

The Brunswick Radiological Emergency Plan describes the general nature of emergency response activities, the available emergency response resources and facilities, and the means for maintaining emergency preparedness. Specific plant implementing procedures have been developed (or existing ones modified) to describe in detail how involved plant and corporate personnel carry out their specific responsibilities as identified in the Plan.

1.3.1.1 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.

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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 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 local governments are summarized herein with details provided in the North Carolina State Emergency Plan.

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 off-site 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 off site, such as taking shelter or 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 activities. The Plan describes post-accident recovery provisions and identifies the transition from the emergency phase to the recovery phase.

1.3.1.2 Emergency Response Resources

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 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 Brunswick 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 Shift Superintendent until relieved by the on-call Site Emergency Coordinator. Because of his overall knowledge, he is best able to bring the full resources of the plant to bear on controlling the emergency. On-site personnel have preassigned roles to support the Site Emergency Coordinator and to implement his directives. These roles, for the purpose of emergency planning, are cast in terms of emergency teams and assignments, each having a designated leader or primary person and alternate(s) assigned to it.

Each team and individual assignment carries with it specific emergency response duties and, where practical, each is provided with an on-shift person to perform those duties on an interim basis. This approach ensures under most conditions that an emergency response duty falls under some predesignated position and provides a smooth transition as additional people are called to the plant, since each one knows ahead of time what his area of responsibilities will be. The Site Emergency Coordinator will also have ready access to the Technical Support Center. This Emergency Facility is comprised of personnel who are knowledgeable of and responsible for engineering and management support. It will assemble 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 directives.

Upon declaration of an Alert, Site Area Emergency, General Emergency, or at the discretion of the Site Emergency Coordinator, the Emergency Operations Facility will be activated and staffed by personnel under the direction of the Emergency Response Manager. The position of Emergency Response Manager is staffed by qualified senior plant management personnel. Once the Emergency Operations Facility has been fully activated, the Emergency Response Manager will be responsible for all off-site emergency response including radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with federal, state, and local agencies. The Emergency Response Manager will manage the corporate response activities, to relieve the Brunswick plant personnel of any activities that could hamper their response efforts, and to marshal the corporate resources needed to properly respond to the emergency.

Progress Energy has a staff of well-trained and experienced engineers, scientists, and technicians. These personnel represent a pool of technical expertise which can be called upon to provide additional support to the emergency response and recovery organizations. Progress Energy personnel will staff a near-site Joint Information Center to interface with the media and general public in order to effectively communicate to the public the nature of an emergency in progress. Available to assist the Brunswick plant in responding to an emergency are Progress Energy personnel assigned to the Shearon Harris and Robinson nuclear plants and the Corporate Offices.

In addition as outlined in Appendix C, 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 local emergency plans. Assistance may also be available from the Nuclear Regulatory Commission, Federal Emergency Management Agency, Department of Energy, and General Electric. The industry resources identified by INPO are also available. Progress Energy is a signatory to the mutual assistance agreement developed by INPO for utilities in the nuclear power industry.

1.3.1.3 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 facilities available include the Brunswick plant Control Room, Operational Support Center, Technical Support Center, Emergency Operations Facility, and Joint Information Center. Each of these facilities, as well as the North Carolina Emergency Operations Center, the Brunswick County Emergency Operations Center, and the New Hanover County Emergency Operations Center, are described in Section 5, Emergency Facilities and Equipment.

1.3.1.4 Emergency Response Plan Maintenance

The Plan, as described in Section 6, provides for maintenance of emergency preparedness by establishing the framework and requirements for training, drills and exercises, and periodic updating. Each Brunswick employee having an emergency response role is trained, and annually retrained, in his area of responsibility and also how his duties fit in with those of others. Each individual must know what is expected of him and what he should expect of others while responding to an emergency. A basic description of the required training for emergency assignment is provided in the 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 integrated plant, state, and local emergency organizations to properly respond to an emergency. The Plan sets forth the frequency and content of such drills and exercises and also establishes how lessons learned will be used to improve the Plan.

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. An Emergency Planning Coordinator is designated to be responsible for overseeing this process as outlined in Section 6.2.

1.4 BRUNSWICK PLANT EMERGENCY PROCEDURES

Plant Emergency Procedures (PEP's) are implementing procedures which 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 or existing procedures modified 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.

1.5 DEFINITIONS

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.

Activated - To formally put on active duty with the necessary personnel and equipment to carry out the function required.

Activating - Key personnel are responding as a mandatory step to make the facility operational within the required time.

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.)

Emergency Action Levels - Plant 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.

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.

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

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

Emergency Operations Facility (EOF) - An on-site support facility for the management of overall licensee emergency response including coordination with federal, state, and local officials, coordination of off-site radiological and environmental assessment, and determination of recommended public protective actions. The EOF is located in the TSC/EOF/Training Building.

Emergency Planning Zones (EPZ) - A generic area defined about a nuclear plant to facilitate emergency planning off site. 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 NUREG-0654. (See Figure 1.1-7)

Exclusion Area - Progress Energy-owned property that surrounds the reactor plants as defined in 10CFR100. 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. This is the property boundary used for off-site dose projections. (See Figure 1.1-1)

Joint Information Center (JIC) - A nearsite facility equipped and staffed by Progress Energy, State, County, and Federal Agencies to coordinate the dissemination of information to the news media and general public during an emergency.

Ingestion Exposure Pathway - The potential exposure pathway to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables. The basis for planning within the 50-mile EPZ.

Manning - A person is in the facility to respond to incoming calls.

Nuclear Incident - An event or series of events, either deliberate or accidental, leading to the release or potential release into the environment of radioactive materials in sufficient quantity to warrant consideration of protective actions.

Operational - The facility is executing its designed functions and tasks.

Operational Support Center (OSC) - The place to which emergency response support personnel report and standby in an emergency situation. The OSC is located in the Operations and Maintenance (O&M) Building.

Plume Exposure Pathway - The potential exposure pathway to the public through (a) whole body external exposure from the plume and from deposited materials, and (b) inhalation of radioactive materials. The basis for planning within the 10-mile EPZ.

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

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

Protected Area - The double-fenced security area with intrusion detection devices immediately surrounding the plant structures. (See Figure 1.1-3.)

Protective Action - An activity conducted in response to an incident or potential incident to avoid or reduce radiation dose to members of the public (sometimes referred to as protective measure).

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

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

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

Restricted Area - Any area, access to which is controlled by Progress Energy for purposes of protection of individuals from exposure to radiation and radioactive materials.

Severe Accident Management Guidelines (SAMGs) - Severe Accident Management Guidelines are entered when Emergency Operating Procedures (EOPs) are not able to maintain adequate core cooling.

Staffing - Key personnel are responding to the facilities as a proactive step to prepare for potential operational status.

State - The State of North Carolina.

Technical Support Center (TSC) - 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. The TSC is located in the TSC/EOF/Training Building.

Unrestricted Area - Any area to which access is not controlled by the licensee for protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

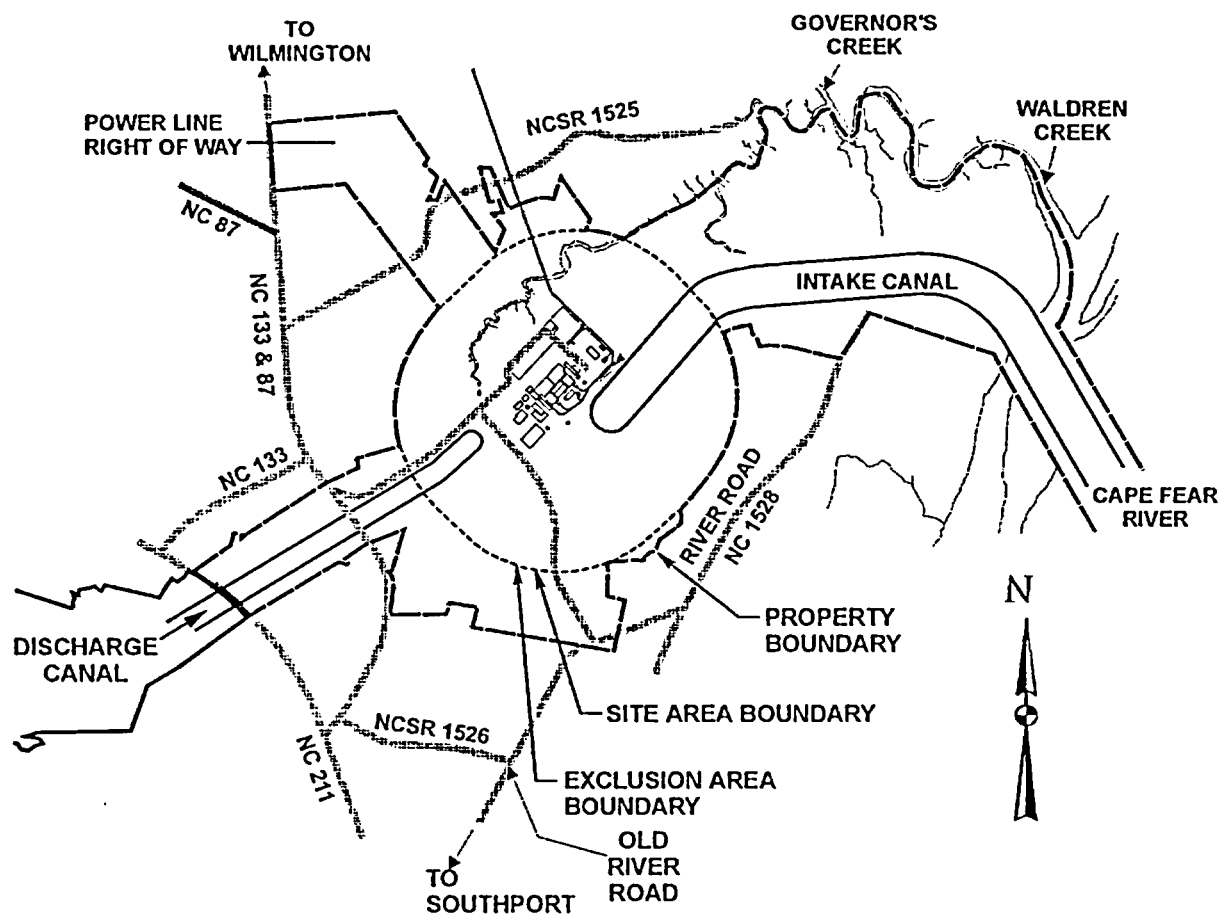
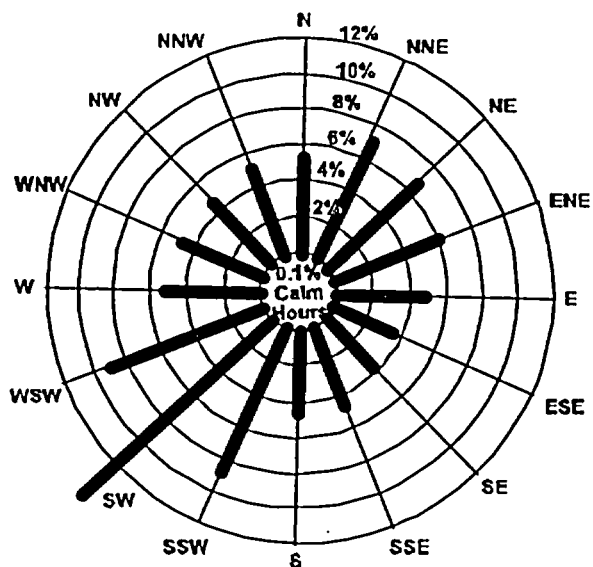
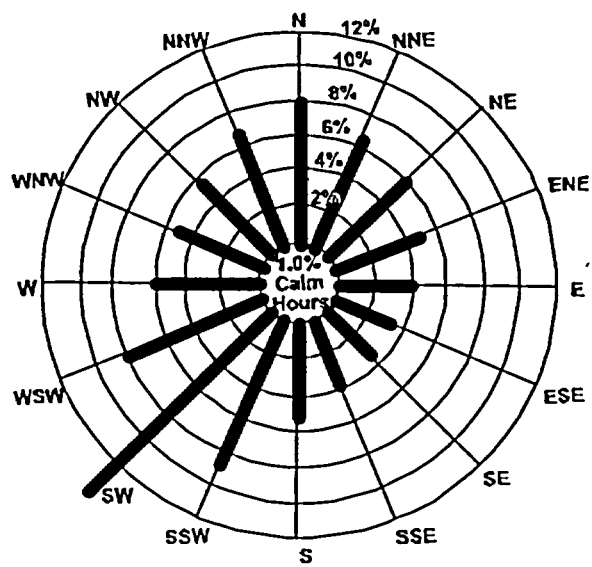


Figure 1.1-1 Brunswick Site Plan



Upper Level Wind Rose

On-site Met Data 1976-1979
 Upper Level Data = 343 feet AGL
 Average Velocity = 15.16 mph
 Data Recovery = 97.9%

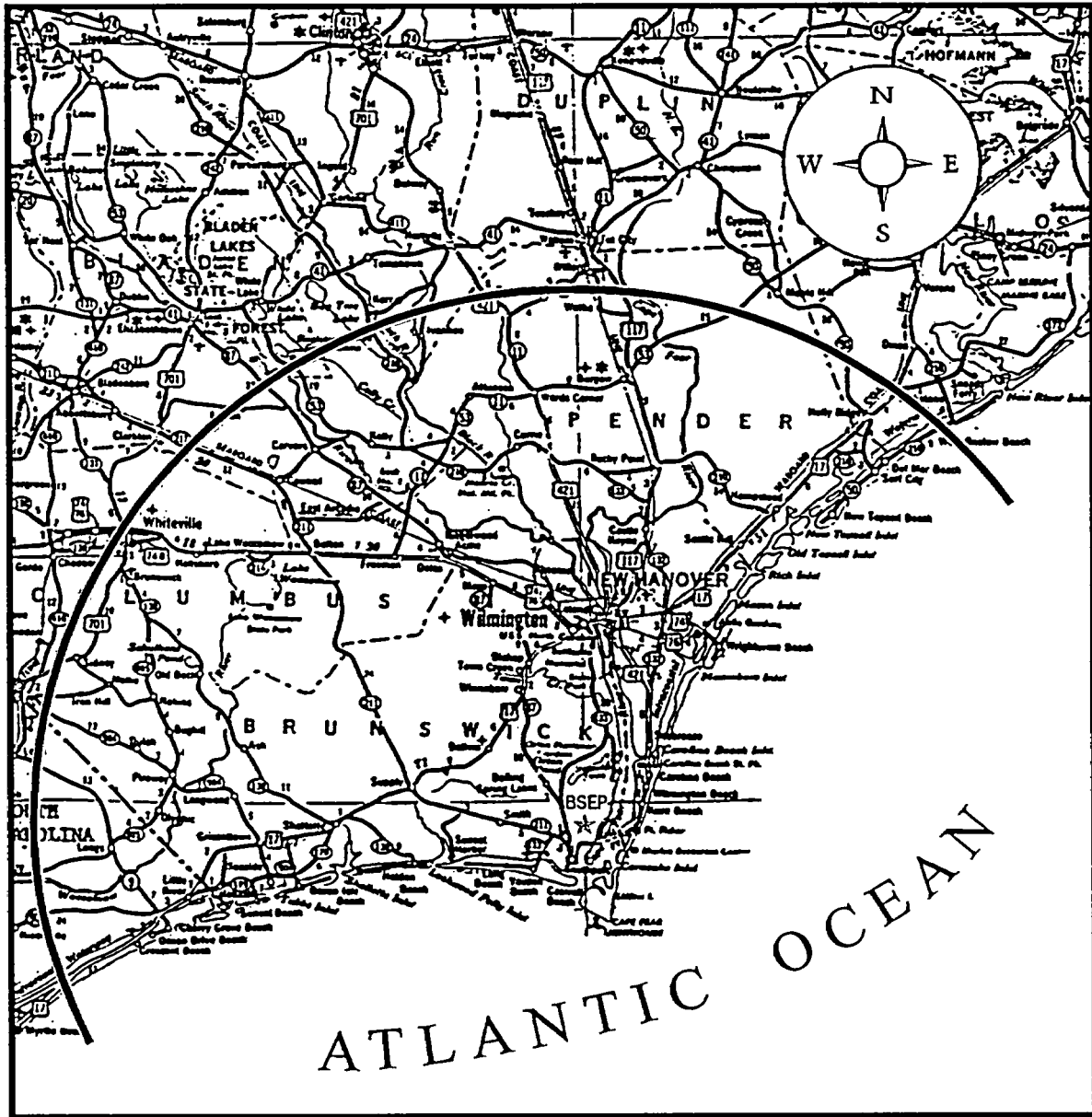


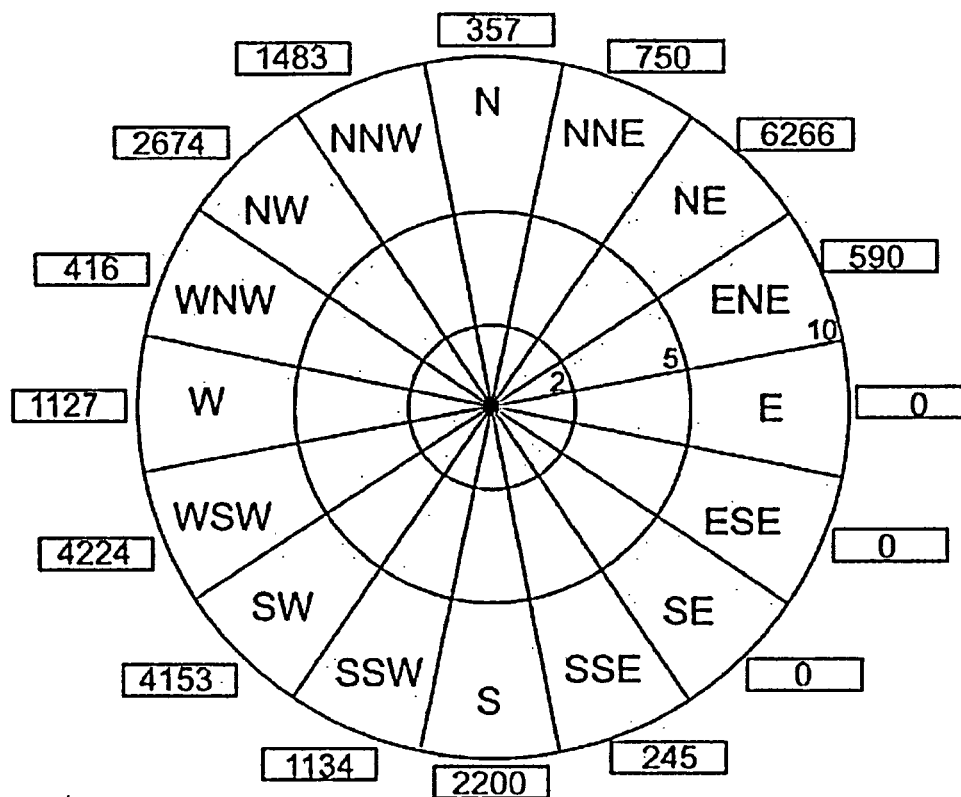
Lower Level Wind Rose

On-site Met Data 1976-1979
 Lower Level Data = 38 feet AGL
 Average Velocity = 8.54 mph
 Data Recovery = 97.8%

Figure 1.1-4 Wind Roses

Figure 1.1-5 50-Mile Ingestion Exposure EPZ





POPULATION TOTALS			
RING MILES	RING POPULATION	TOTAL MILES	CUMULATIVE POPULATION
0-2	1074	0-2	1074
2-5	5697	0-5	6771
5-10	18848	0-10	25619

25619 Total Segment Population
0 to 10 miles

*LOCAL PLANNING ZONES	RES. POP.	PEAK POP.
A	1542	932
B	1609	16387
C	787	1335
D	9297	32422
E	2077	745
F	3193	1204
G	890	64
H	818	1073
K	6511	55517
TOTALS	26724	109679

*See Figure 1.1-2

BRUNSWICK SITE
PLUME EXPOSURE PATHWAY
10 Mile Emergency Planning Zone
Figure 1.1-6 Population Totals

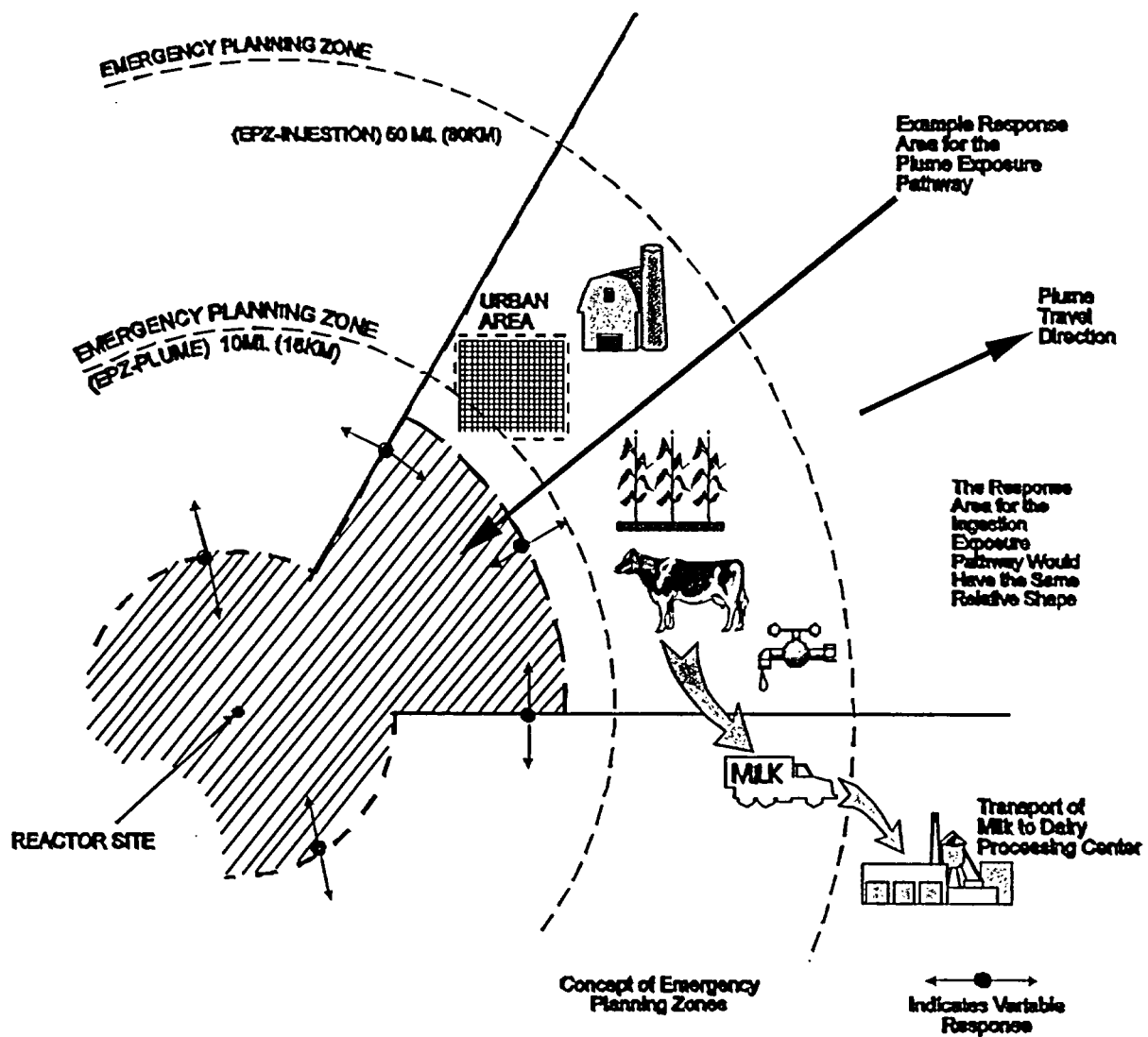


Figure 1.1-7 Concept of Emergency Planning Zones

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

2.0 EMERGENCY CLASSIFICATIONS

A key element of this Plan is a preplanned 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 3 in turn will discuss the plans for notification of off-site agencies and mobilization of emergency teams and how they may vary with the level of the emergency.

2.1 GENERAL CLASSIFICATION SYSTEM

The operating staff is provided formal training to recognize and respond in a logical manner to off-normal plant conditions. Plant abnormal and emergency instructions are designed to allow plant personnel to mitigate the consequences of and correct an off-normal condition as quickly as possible following its occurrence. The procedures identify the conditions requiring implementation of this Plan. Figure 2.0-1 shows the basic response sequence that is followed during any off-normal condition.

The types of potential emergencies vary in probability and consequences. Accordingly, any system that categorizes emergencies must be both wide-ranged and flexible. This Plan adopts the NRC recommended standard of four general classes of emergencies and, as described below, includes the methods for determining the class in which a specific type of event should be placed.

There are three basic tests or criteria that must be considered in deciding which emergency class exists. These are:

1. Radioactivity release: Is a release occurring; and if so, what is its magnitude?
2. Core damage: If no release to the environment is occurring, has there been a release of fission products from the fuel? Do the radiation levels in the coolant system or primary containment pose a potential danger to the public?
3. Plant degradation: Has the plant responded to equipment failures or external events as designed? If the plant has not responded as expected, what is the prognosis for a safe recovery, or alternately that further degradation will occur (e.g., corrective action is not likely to be successful or cannot be accomplished before a major release occurs)?

The categorization of events and combinations of events according to one of the four emergency classes is implemented through Emergency Action Levels (EALs). These are specific sets of plant conditions, instrument readings, and events which, unless promptly corrected, coincide with the conditions associated with one of the four emergency classes.

EALs for the Brunswick Nuclear Plant are included as an attachment to the Radiological Emergency Response Plan and are provided in OPEP-02.1, Initial Emergency Actions.

The EALs have been selected with a view towards ensuring that a reasonable time is available to diagnose the specific cause of the emergency and attempt immediate corrective actions.

Once an emergency is declared, assessments of core and containment conditions, projected releases, and resultant exposures are performed. The results, along with other plant status assessments, are reported to off-site agency officials who decide, based on these inputs, whether or not protective actions for the public are to be implemented. The relationship of dose assessment values to the Environmental Protection Agency (EPA) Protective Action Guides (PAGs), and the possibility of approaching or exceeding the PAGs, will specifically be reported. Section 4 describes the relationships between emergency classes, PAGs, and various emergency measures.

Each of the four emergency classes are discussed below.

2.2 UNUSUAL EVENT

Unusual events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant.

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 judgment, the status of the plant warrants it. Initiating conditions are established as EALs for the determination of this class. Specific EALs for an Unusual Event are listed in OPEP-02.1, Initial Emergency Actions.

An Unusual Event does not require the activation of the entire on-site emergency organization, but the Site Emergency Coordinator can direct that additional personnel come to the site to support shift workers. Off-site 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 3.9, and emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during an Unusual Event are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert Site Area Emergency, General Emergency.

2.3 ALERT

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

Initiating conditions are established as EALs for determination of an Alert and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare an Alert whenever he concludes that plant conditions so warrant.

Events in this class may reflect a significant degradation in the safety of the reactor. However, releases from such events will be small. Off-site mobilization and assessment actions will be initiated to ensure that emergency personnel are readily available to respond if situations become more serious and confirm that radiation levels in the environment do not require protective actions off-site. Notifications and activation of emergency organizations are discussed in Section 3.9, and the emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during an Alert are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

2.4 SITE AREA EMERGENCY

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

Initiating conditions are established as EALs for determination of the Site Area Emergency class and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare a Site Area Emergency whenever he concludes that plant conditions so warrant.

The Site Area Emergency class includes Alert conditions where the plant personnel have been initially unsuccessful in restoring the facility to a safe shutdown condition. It also includes Alert conditions where subsequent additional malfunctions have occurred. 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 set into motion all personnel on site and off site that would be required to perform actions up to and including the evacuation of a near-site area. If circumstances warrant, the process of public notification may begin as directed by the state plan. Section 3.9 discusses the planned process of notification and activation of emergency organizations. Emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during a Site Area Emergency are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

2.5 GENERAL EMERGENCY

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

Initiating conditions predictive of a major radiological release are established as Emergency Action Levels for determination of the General Emergency class and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare a General Emergency whenever, in his judgment, conditions exist that warrant activation of emergency response efforts including off-site 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 off-site exposures will approach or exceed EPA recommended protective action guides unless protective measures are instituted. Notifications and activation of emergency organizations are discussed in Section 3.9. The emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during a General Emergency are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

THE SHIFT SUPERINTENDENT
LEARNS OF AN OFF-NORMAL
CONDITION, DETERMINED BY
INSTRUMENT READINGS OR
OBSERVATION. SHIFT
SUPERINTENDENT IMPLEMENTS
OPEP-02.1, WHICH FLOWS AS

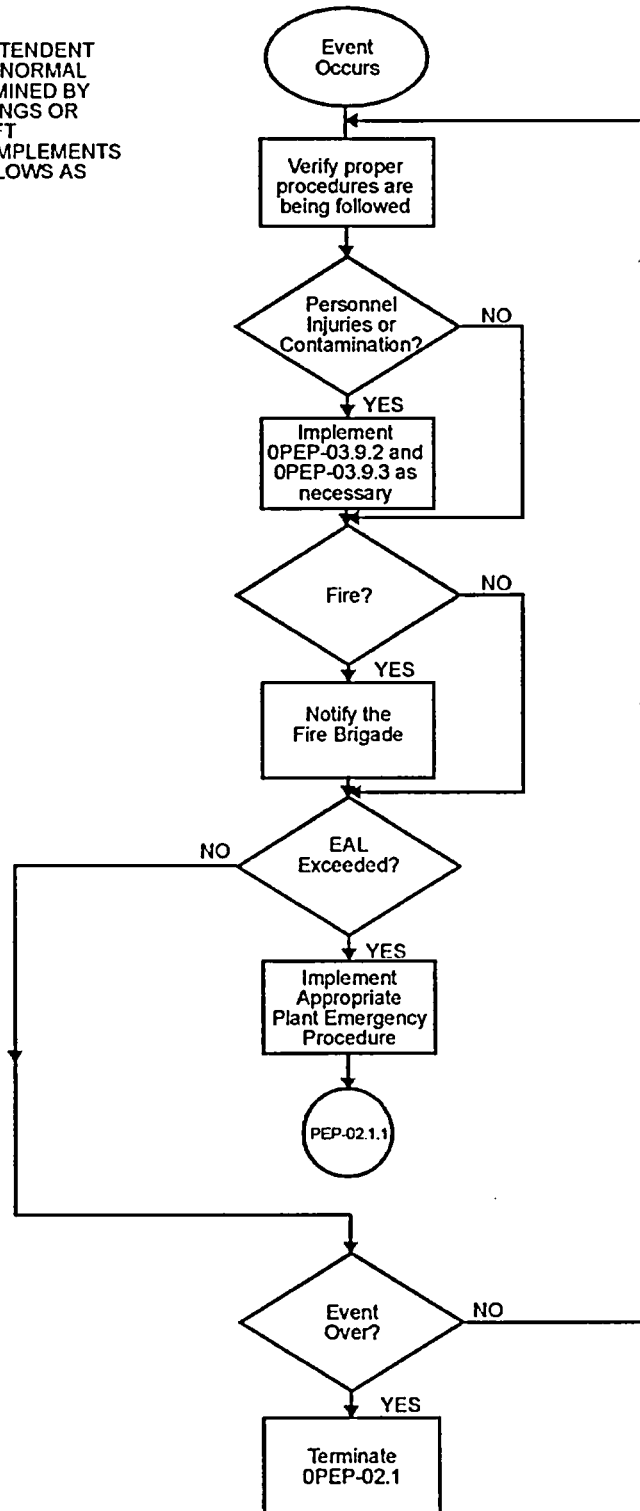


Figure 2.0-1
Response Sequence to Off-Normal
Conditions

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

3.0 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 Brunswick Radiological Emergency Plan employs an organizational concept that has four features.

1. 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
2. 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, he is freed of all other responsibilities and thus able to devote his entire effort to managing the emergency response.
3. Specific individuals are assigned the responsibility of carrying out predefined critical actions.
4. 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. 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 2, 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, off-site 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.

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 off-site related activities. The Site Emergency Coordinator maintains overall on-site emergency response responsibilities and reports to the Emergency Response Manager.

Initially the Site Emergency Coordinator would be the Operations Shift Superintendent who would act in that capacity until formally relieved by the designated On-Call Site Emergency Coordinator or alternate (qualified SECs are listed in EPL-001) in the Technical Support Center. In this manner, the individual usually in charge of activities in the Control Room is responsible for initiating the necessary emergency response, but the emergency response organization On-Call SEC is expected to assume management of 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 designated emergency response personnel 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 personnel assume the responsibility for performing the required emergency response actions until properly relieved by another emergency response organization member qualified for the position. All emergency response organization members are trained as described in Section 6.1.1.

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 on-site personnel.

A current call list of emergency response organization members is maintained in the Control Room and procedures are available to make this notification. Since many of the Brunswick plant management staff and substantial numbers of its support personnel live in the site vicinity (i.e., Southport and surrounding areas) additional assistance can be quickly provided.

3.1 NORMAL OPERATING ORGANIZATION

The greatest number of people on site occurs during day shift operations. The plant crew available to respond to an emergency provides a broad spectrum of specialties including operations, maintenance, engineering, radiochemistry, health physics, fire protection and security. The Plan, as will be discussed, utilizes the basic plant organizational structure and cadre of available manpower as the principal means of responding to an emergency condition. This is accomplished by assigning the management of various emergency response functions to individuals in accordance with their routine operational responsibilities. To illustrate, Radiological Emergency Teams will be directed by Environmental & Radiation Control, management personnel, who are the individuals responsible for directing day-to-day radiation control programs. In the event of an emergency, they report directly to the Site Emergency Coordinator and continue to be responsible for radiological matters.

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

Each operating shift will normally consist of a Shift Superintendent, two Senior Control Operators, four Control Operators, seven Auxiliary Operators, three Health Physics Technicians, one Chemistry Technician, and one Shift Technical Advisor (STA). Deviation from the normal shift complement is allowed as long as the minimum shift complement, as described in Technical Specification 5.2.2.c and UFSAR Table 13.1.2-1, is maintained and appropriate action is taken (see Figure 3.1-1).

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. It should be noted that they are initially responsible under all circumstances, and remain so until relieved. 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.

3.2 ON-SITE EMERGENCY ORGANIZATION

The minimum on-site emergency organization for non-normal working hours, backshifts, and holidays for the Brunswick Plant is described above in Section 3.1. Compliance with the requirements of NUREG 0654 Table B-1 has been assured. Guidance for augmenting the emergency organization is found in the notification checklists of the plant emergency procedures. Individuals' names and roles in the emergency organization, phone numbers, and alternates are also described in the plant emergency procedures. EPL-001 lists the individuals and alternates qualified to fill the positions described for the TSC, OSC, and EOF.

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. Since a large portion of the Brunswick staff lives in the vicinity of the plant, additional personnel will be available for communications, on-site and off-site 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 on-site organization. The on-site 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 Table B-1 of NUREG 0654. Additional personnel will continue to supplement the plant emergency organization as necessary to meet the requirements of this Plan. Periodic drills will be conducted to determine that this augmentation schedule can be maintained.

As an aid toward assuring that critical emergency actions are given proper attention, the plant's emergency procedures provide for emergency response personnel established to carry out specific types of functions such as accident assessment and off-site notification. As discussed below, emergency response organization personnel 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 Figures 3.2-1, 3.4-1, and 3.6-1.

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 records (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 in the Plan's implementing procedures. The Emergency Response Organization personnel telephone numbers are available in the Control Room. In all emergencies, the on-duty Shift Superintendent is authorized and qualified to implement the Plan and to classify the emergency condition.

3.2.1 Site Emergency Coordinator

As discussed in Section 3.1, direction and coordination of emergency actions on-site (and off-site until relieved by the Emergency Response Manager) are *prime responsibilities* of the Site Emergency Coordinator. The initial determination that an emergency exists will be made in the Control Room, based on measured plant parameters. Therefore, the Shift Superintendent is initially the Site Emergency Coordinator. If the Shift Superintendent becomes incapacitated for any reason, the Senior Control Operator of the unaffected unit will assume the responsibilities of the SEC. He will be in command of the on-site emergency organization until relieved by the designated On-Call Site Emergency Coordinator. The Shift Superintendent will be relieved by the first qualified SEC to arrive on site so that he may devote his attention to plant operations. The Shift Superintendent remains responsible for the decision making of Severe Accident Management Guidelines strategies.

Names and phone numbers of qualified Site Emergency Coordinators are available in EPL-001. He will also appoint an Emergency Communicator who will relay messages and maintain notification records throughout the emergency.

Any individual who may be required to serve, even temporarily, in the capacity of a Site Emergency Coordinator must be qualified and trained in accordance with the training program described in Section 6.1.1.

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

1. Coordinating and directing the combined activities of Brunswick personnel in the Control Room, Technical Support Center, Operational Support Center, and elsewhere on the site.
2. Classifying the emergency.
3. Notifying off-site plant, corporate, and local agency personnel, as well as on-site 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 off-site agencies.)
4. Issuing instructions to emergency response personnel 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 on-site resources.
9. 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 recommendations to authorities responsible for off-site emergency measures. Further, while he may consult with others, he may not delegate the responsibility to upgrade or downgrade the emergency classification or to declare that the emergency has been terminated. He may delegate the responsibility to announce that the emergency has been terminated. He 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. (Responsibility for mobilization of recovery efforts transfers to the Emergency Response Manager upon activation of the EOF.)

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.

3.2.2 Plant Operators

During an emergency, the Plant Operators (including the Shift Superintendent) 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 instructions and perform initial calculations of projected off-site consequences. The Operators are responsible for implementing actions (including Severe Accident Management Guidelines) as directed by the Shift Superintendent. Specific emergency response duties of the Plant Operators are found in the Plant Emergency Procedures which implement the Plan and in other Operations procedures.

3.3 Technical Support Center

The Site Emergency Coordinator, as discussed above, 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 directives, a Technical Support Center has been established. The Technical Support Center consists of management-level personnel. Upon declaration of an Alert, Site Area Emergency, or General Emergency, the Technical Support Center will be notified to immediately assemble. The SEC and other TSC staff members perform monitoring and evaluations required for Severe Accident Management Guidelines, and provide advice and recommendations to the Shift Superintendent and Control Room Operators.

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

- Plant Operations
- NRC Communications
- Radiological Control
- Technical Assessment
- Security

Directors are assigned to be responsible for activities within each category.

The Directors within the Technical Support Center may be relieved by designated qualified plant personnel (phone numbers are listed in EPL-001).

3.3.1 Plant Operations Director

The Plant Operations Director is responsible to the Site Emergency Coordinator for providing liaison with the Control Operators, Shift Superintendent, and Technical Support Center. He is responsible for providing technical and administrative assistance to the Control Operators. This position also performs monitoring and evaluations required for Severe Accident Management Guidelines. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.2 Radiological Control Director

The Radiological Control Director 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; and providing liaison with the Emergency Operations Facility and with the Radiological Control Manager. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.3 Technical Assessment Director

The Technical Assessment Director is responsible to the Site Emergency Coordinator for providing technical and administrative direction to the Accident Assessment Team and for providing liaison with the Technical Analysis Manager after the EOF is activated. The Technical Assessment Director is responsible for performing the monitoring and evaluations required for Severe Accident Management Guidelines. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.4 Security Director

The Security Force is composed of personnel qualified in security, personnel accountability, and evacuation procedures and practices.

The Security Director is responsible to the SEC for providing direction to the Security Force during a declared emergency and providing liaison with the state and local law enforcement agencies. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.5 Communications Director

The Communications Director in the TSC reports to the Site Emergency Coordinator. He is responsible to make plant-wide announcements over the Public Address System, ensure NRC notifications are performed, and supervise the administrative staff. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center and OPEP-02.6.21, Emergency Communicator.

3.3.6 Radiological Control Communicator

The Radiological Control Communicator is responsible to the Radiological Control Director for expediting communications between the director and the Radiological Emergency Teams. The responsibilities and objectives of the Radiological Control Communicator are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.7 Accident Assessment Team Leader

One of the principal groups housed within the Technical Support Center is the Accident Assessment Team. The specific responsibilities of the Accident Assessment Team are as follows:

- A. Analyze mechanical, electrical, instrument and control problems and determine alternate solutions.
- B. Analyze thermohydraulic and thermohydrodynamic problems and develop alternate courses of action to resolve them.
- C. Analyze and evaluate accident conditions and develop guidance for the Site Emergency Coordinator and Operations personnel on protection of the core.
- D. Perform monitoring and evaluations to support Severe Accident Management Guidelines.

The Accident Assessment Team Leader is responsible to the Technical Assessment Director and provides technical and administrative direction to the Accident Assessment Team.

3.4 Operational Support Center

3.4.1 Emergency Repair Director

The Emergency Repair Director 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 cleanup activities during an emergency. These responsibilities include providing technical and administrative direction to any emergency repair team that may be formed during the emergency and to the Operational Support Center Mission Coordinator. Responsibilities of this position are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.2 Operational Support Center Mission Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an OSC Mission Coordinator will report to the Emergency Repair Director. This individual will direct the activities of the mechanical, electrical, and I&C personnel requested to report to the OSC. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center. He will coordinate OSC response activities with the E&RC and Operations Coordinators.

3.4.3 Operations Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an Operations Coordinator will report to the Emergency Repair Director. This individual will coordinate the activities of operations and Fire Brigade personnel with the OSC Mission Coordinator and E&RC Coordinator. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.4 Environmental & Radiological Control (E&RC) Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an E&RC Coordinator will report to the Emergency Repair Director. This individual will direct the activities of the radiological controls (HPs) and chemistry personnel requested to report to the OSC. He will coordinate OSC response activities with OSC Mission Coordinator and Operations Coordinator. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.5 Radiological Emergency Teams

The Radiological Emergency Teams consist of members of the Environmental & Radiation Control organization and of other plant or off-site 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 direct guidance.

The general functions of the various Radiological Emergency Teams include:

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

Radiological emergency teams are formed from the pool of available personnel who assemble in the Operational Support Center. These teams are in addition to the emergency repair teams that are formed from the pool of mechanics, electricians, and instrument technicians to perform repair missions in the plant.

The radiological emergency teams formed are determined by the radiological conditions that require their services. The following teams may be necessary:

1. Plant Monitoring - responsible for conducting in-plant and inside the protected area monitoring to include air sampling, direct radiation monitoring, and smear surveys to determine radiological conditions.
2. Post Accident Sample - responsible for obtaining and analyzing highly radioactive gas and/or liquid samples necessary for source term determination and core damage assessment.
3. Personnel Protection and Decontamination - responsible for monitoring and verifying that personnel and vehicles exiting the protected area and the site are free of radioactive contamination.

3.4.6 Fire Brigade

When conditions require activation of the emergency facilities, the on-shift Fire Brigade is incorporated into the Operational Support Center.

The Fire Brigade consists of a Shift Incident Commander and a minimum of four fire brigade members who provide fire brigade, first aid, search and rescue, chemical/hazardous materials response, and confined space entry services. Fire Brigade members will be the on-shift operators, or other personnel qualified as Fire Brigade members. The Fire Brigade, when incorporated into the OSC, functions as a team under the direction of the Operations Coordinator. The Fire Brigade is staffed on a 24-hour basis.

3.5 Emergency Operations Facility

The Emergency Operations Facility is activated by the On-Call Emergency Response Manager when he is notified by the Site Emergency Coordinator that an Alert or higher emergency condition exists at Brunswick. Guidance for activation and operation of the EOF is contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.1 Emergency Response Manager

The Emergency Response Manager is responsible for providing liaison between the Site Emergency Coordinator and off-site support personnel (Corporate Headquarters, Joint Information Center, state and federal agencies) and marshalling off-site support as required to support the Site Emergency Coordinator. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.2 Administrative and Logistics Manager

The Administrative and Logistics Manager is responsible to the Emergency Response Manager for providing assistance to the Emergency Response Manager and site personnel in administrative, logistics, communications, and personnel support, as requested. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.3 Technical Analysis Manager

The Technical Analysis Manager 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 for the Emergency Response Manager to consultants, regulatory agencies, architect-engineers, and General Electric. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.4 Radiological Control Manager

The Radiological Control Manager is responsible to the Emergency Response Manager for coordinating off-site radiological and environmental assessment and recommending to the Emergency Response Manager protective actions necessary to protect the public health and safety. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.5 Environmental Monitoring Team Leader

The Environmental Monitoring Team Leader is responsible to the Radiological Control Manager when the EOF is activated, for providing technical and administrative direction to the Environmental Monitoring Team. Two Environmental Monitoring Teams will be made available for deployment. If additional monitoring teams are needed, they may be requested from the Shearon Harris Plant or the H. B. Robinson Plant. The responsibilities and objectives of the environmental monitoring team are contained in OPEP-02.6.6, Environmental Monitoring Team Leader.

3.5.6 Dose Projection Coordinator

The Dose Projection Coordinator is responsible to the Radiological Control Manager and provides technical and administrative direction to the Dose Projection Team when the EOF is activated. Responsibilities of the Dose Projection Team include radiological dose projections and source term determination, contained in OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures, and acquisition and distribution of meteorological data for dose assessment and environmental monitoring purposes. The responsibilities and objectives of the Dose Projection Team are contained in OPEP-02.6.20, Dose Projection Coordinator.

3.5.7 Communications Managers

The Communications Managers report to the Emergency Response Manager. They function as liaison between the off-site organizations and agencies and the on-site emergency organization. Specifically, they relay messages between the ERM in the EOF, Technical Support Center, and the State Emergency Response Team, using the communication equipment discussed in Appendix A of this plan. The responsibilities of this position are contained in OPEP-02.6.21, Emergency Communicator.

3.5.8 Assistant to the Emergency Response Manager (AERM)

The Assistant to the Emergency Response Manager is responsible to the Emergency Response Manager for coordination of information within the Emergency Operations Facility. Reporting to the Assistant AERM are County EOC Representatives (utility representative) that respond to the New Hanover and Brunswick County EOCs. The responsibilities of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.6 Joint Information Center

The Joint Information Center is activated by the Emergency Response Manager when he is notified that a Site Area Emergency or General Emergency condition exists at Brunswick. Activation is discretionary for lesser emergency classifications. (Fig. 3.6-1)

3.6.1 Company Spokesperson

The Company Spokesperson is responsible to the Emergency Response Manager for the coordination of plant information with County, State, and Federal representatives for dissemination to the news media and general public. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.2 JIC Director

The JIC Director is responsible to the Company Spokesperson as the primary interface with State, County, and Federal Public Information Coordinators and for the preparation and coordination of all news releases. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.3 Company Technical Spokesperson

The Company Technical Spokesperson is responsible to the JIC Director for the acquisition, coordination, and interpretation of plant technical information disseminated to the news media and general public. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.4 Administrative Coordinator

Administrative Coordinators are responsible to the JIC Director for initial JIC facility setup, and the coordination of logistical, security, and administrative duties. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.5 Public Information Director

Public Information Directors are responsible to the JIC Director for monitoring and coordinating the flow of media and general public information in the Joint Information Center. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.7 OFFSITE ORGANIZATION ASSISTANCE

Should conditions at the plant degrade to the extent that further on-site assistance is needed, assistance is available from Corporate personnel, contracted services, and certain locally available service groups, as described in the following subsections.

3.7.1 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 E&RC Technicians), and engineering and consulting services. For example, contracts are maintained with General Electric (the NSSS vendor and architect-engineer for the Brunswick plant).

General Electric will form a Technical Support Team upon request. The team will be composed of personnel with the appropriate technical disciplines, that can be dispatched to the plant site. General Electric will also establish dedicated telephone communications for data transmission until the arrival of the team.

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

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

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

3.7.2 Local Services Support

The Brunswick Plant 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.

3.7.2.1 Medical Assistance

Dosher Memorial Hospital has medical facilities immediately available for the treatment of contaminated and non-contaminated injured personnel.

New Hanover Regional Medical Center will serve as a backup for Dosher Memorial if necessary.

In addition, medical assistance is available on or off site from physicians in the Southport area, all of whom are on the staff of Dosher Memorial Hospital and who have agreed to provide medical assistance to contaminated patients. (See Appendix E, Medical Treatment and Assistance, for more details.)

3.7.2.2 Ambulance Service

The City of Southport Volunteer Rescue Squad has agreed to respond to all emergency calls from the plant, just as they respond to other calls from the Southport area. A copy of the response agreement with the City of Southport Rescue Squad is included in Appendix B.

3.7.2.3 Fire Assistance

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

Southport Fire Department
Boiling Spring Lakes Fire Department
Yaupon Beach Volunteer Fire Department
Oak Island Emergency Services
Sunny Point Fire Department

The Southport Fire Department is the primary fire protection response agency for the Brunswick Plant and will coordinate assistance activities, if required, of the other above agencies. Copies of agreements with local fire departments are contained in Appendix B. In addition, the North Carolina Fire Protection Law makes provisions for volunteer fire departments to furnish fire protection in rural areas.

3.8 COORDINATION WITH PARTICIPATING GOVERNMENTAL AGENCIES

A summary of each governmental organization having major responsibilities for the planning and response to Brunswick Plant radiological emergencies is described below; comprehensive summary tables of emergency response organizations are included in Appendix C; 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.

3.8.1 State of North Carolina

3.8.1.1 Governor's Office

The Governor has the authority to direct and control the State Emergency Management Program. During a declared State of Disaster, he has the authority to utilize all available state resources reasonably necessary to cope with emergencies. His representatives coordinate as necessary with Progress Energy, the Governor of South Carolina, and with local government officials.

3.8.1.2 Department of Crime Control and Public Safety

The Department of Crime Control and Public Safety functions as the State of North Carolina Emergency Planning Coordinator. In that capacity the Department has overall management responsibility for North Carolina's radiological emergency response planning, development, and updating of North Carolina's emergency response plan, and coordination with Progress Energy. The Department coordinates emergency response activities for the State of North Carolina and other government response agencies.

3.8.1.3 Department of Environmental Health and Natural Resources,
Division of Radiation Protection

The Radiation Protection Division, performs radiological field monitoring and laboratory analysis of field samples. This section is responsible for dose assessments and projections and personnel radiological monitoring outside the Brunswick site, and other functions as described in the State Emergency Plan.

3.8.2 Brunswick County

3.8.2.1 Emergency Management Agency

The Brunswick County Emergency Management Agency has overall responsibility for Brunswick County's radiological emergency response planning, development, and updating of Brunswick 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 State of North Carolina's Division of Radiation Protection.

3.8.2.2 Brunswick County Sheriff's Department

The Sheriff's Department emergency response functions are:

- A. Coordinate all local law enforcement and traffic control.
- B. Operate the county warning point on a 24-hour basis.
- C. Provide immediate assistance to facility management and local authorities during initial onset of the emergency.

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

3.8.3 New Hanover County

3.8.3.1 Emergency Management Agency

The New Hanover County Emergency Management Agency has overall responsibility for New Hanover County's radiological emergency response planning, development, and updating of New Hanover 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 State of North Carolina's Division of Radiation Protection.

3.8.3.2 New Hanover County Sheriff's Department

The Sheriff's Department emergency response functions are:

- A. Coordinate all local law enforcement and traffic control.
- B. Operate the county warning point on a 24-hour basis.
- C. Provide immediate assistance to facility management and local authorities during initial onset of the emergency.

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

3.8.4 Federal Agencies

3.8.4.1 Department of Energy, Savannah River Operations Office

The Savannah River Operations Office coordinates, under the Interagency Radiological Assistance Plan (IRAP), 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 State of North Carolina, Department of Environmental Health and Natural Resources, Division of Radiation Protection, or the Nuclear Regulatory Commission (NRC); the 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. The Site Emergency Coordinator or Emergency Response Manager after activation of the Emergency Operations Facility may request this assistance via the NRC or the State. Resources available in the area to facilitate federal assistance include the New Hanover International Airport,

located approximately twenty miles from the Brunswick Plant near Wilmington, North Carolina, which has two runways capable of supporting large commercial aircraft. Also located at the New Hanover International Airport is a National Guard Armory. This area could be used as a Federal Command Post meeting the requirements of IRAP.

3.8.4.2 Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency coordinates, through the Atlanta, Georgia Regional IV Office, federal response as required to supplement that provided by IRAP. A representative from FEMA Region IV will be present at the SERT to coordinate any federal response requested by the state.

3.8.4.3 Nuclear Regulatory Commission (NRC)

The Nuclear Regulatory Commission provides resident inspectors at Brunswick. At the request of Progress Energy, NRC provides additional technical advice, technical assistance, and personnel during and following a radiological emergency. The Director of Regulatory Operations will be notified of radiation incidents in accordance with 10CFR20.2202 and will conduct appropriate investigative activities.

3.8.4.4 U. S. Coast Guard (USCG)

The Coast Guard controls access of navigable waterways in the vicinity of the Brunswick Plant and provides public warning and notification as described in the State Emergency Plan.

3.8.4.5 Meteorological Service

Meteorological Services are under contract with Progress Energy to provide meteorological services during day to day and/or emergency operations.

3.8.4.6 Weather Service

The National Weather Service in Wilmington, North Carolina will provide meteorological information during emergency situations, if required. Data available will include existing and forecasted surface wind directions, wind speed with azimuth variability, and ambient surface air temperature.

3.8.5 Agreements

Appendix B presents copies of letters of agreement with agencies that would not normally be available for assistance through existing state or federal plans but will make certain services available.

3.9 NOTIFICATION AND ACTIVATION

Notification and activation of the on-site and off-site emergency response organizations is dependent upon the emergency classification and is listed in Table 3.5-1. Details of notification responsibilities, communications systems utilized to make the notifications, information required to be transferred to off-site agencies, and notification verification techniques are specifically described in the Plant Emergency Procedures (PEPs) and Appendix A of this Plan. Additional individuals and organizations who might be required to activate are contained in EPL-001.

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

The State of North Carolina and the Counties of Brunswick and New Hanover are responsible for the process of notification of the public. The initial instructions to the public will consist of preestablished emergency messages which will be tailored to reflect whether the event is a Site Area Emergency or General Emergency classification. The following information is typical of that which would be provided in the initial message:

1. Identification of the agency issuing the information.
2. A statement that an emergency condition exists at the Brunswick Nuclear Plant.

3. Brief description of the type of emergency and the nature of the hazard.
4. Identification of the communities or geographical areas affected by the emergency.
5. Recommendations with regard to specific protective measures to be taken by residents of the affected areas. .
6. A statement concerning how the public will receive further emergency information.

Prewritten emergency messages to be used for public notification are contained in the procedures of the State of North Carolina, and Brunswick and New Hanover Counties.



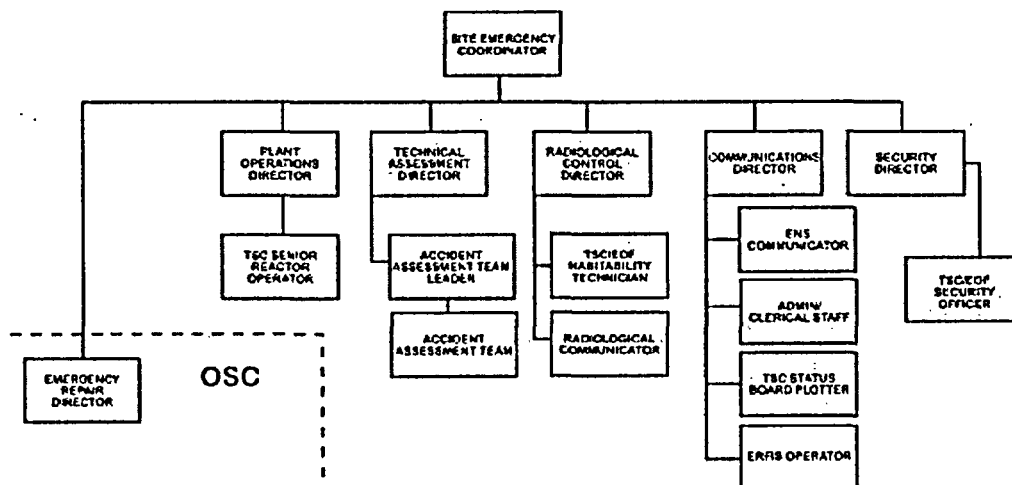
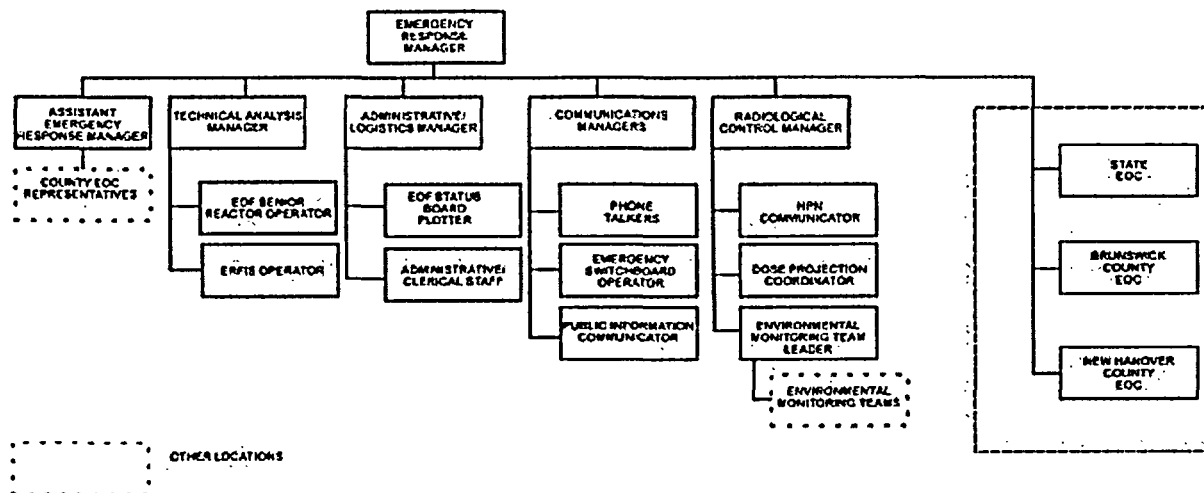
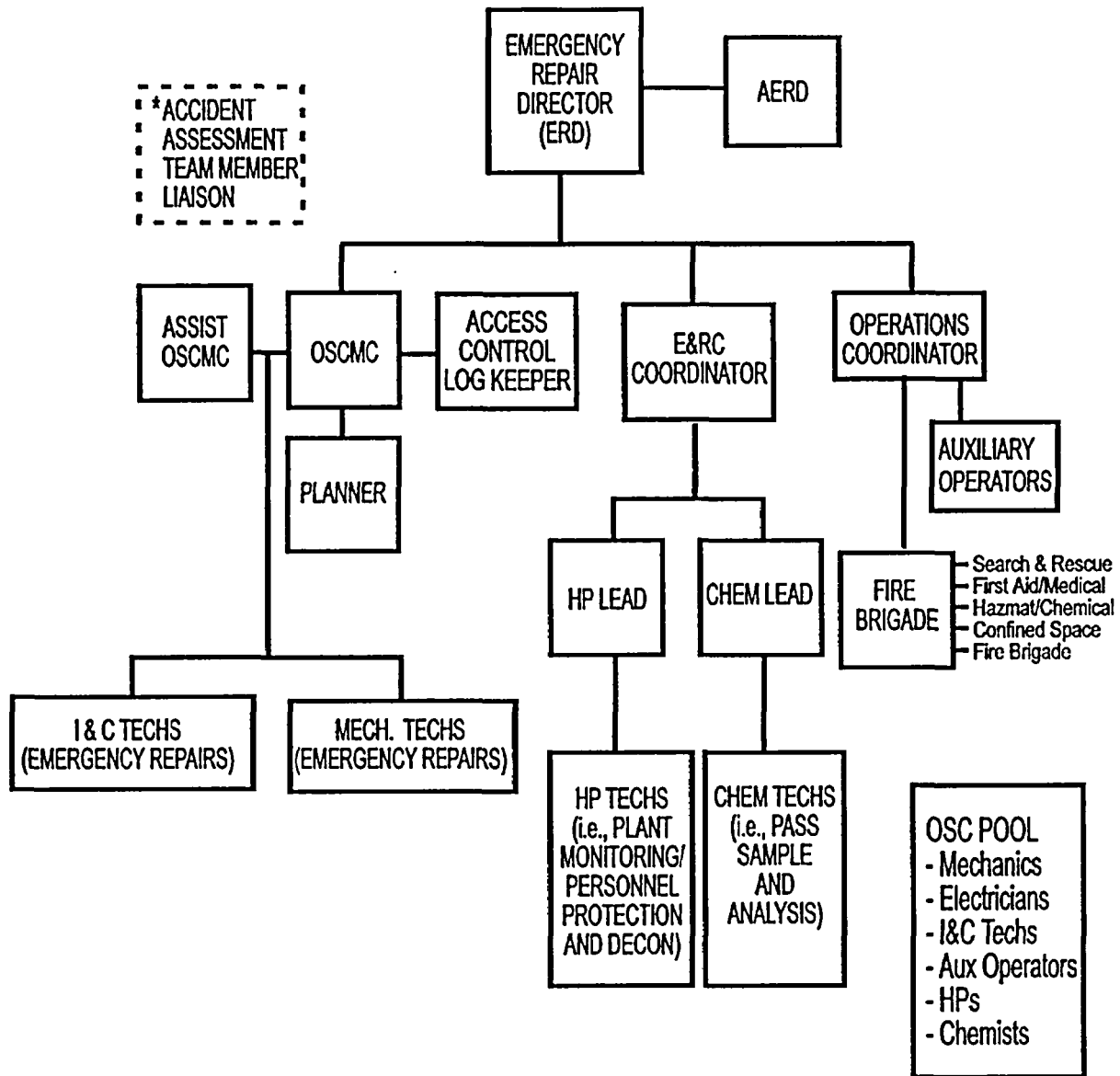


Figure 3.2-1 Brunswick Emergency Organization



* REPORTS TO ACCIDENT ASSESSMENT TEAM LEADER IN TSC.

Figure 3.4-1 Operational Support Center (OSC)

BRUNSWICK

TABLE 3.5-1

NOTIFICATION AND ACTIVATION OF PRINCIPAL EMERGENCY RESPONSE ORGANIZATIONS

<u>Agency</u>	<u>Unusual Event</u>	<u>Alert</u>	<u>Site Emergency</u>	<u>General Emergency</u>
On site: Progress Energy Plant Operators	Activate	Activate	Activate	Activate
Radiological Emergency Teams	(a),(c)	(a)	Activate	Activate
Technical Support Center	(a),(c)	Activate	Activate	Activate
Operational Support Center	(a),(c)	Activate	Activate	Activate
Emergency Operations Facility	(a),(c)	Activate	Activate	Activate
Corporate Headquarters	Notify(a)	Notify(a)	Activate	Activate
Fire Brigade	(a)	(a)	(a)	(a)
Off site:				
Joint Information Center	(a),(c)	(a),(c)	Activate	Activate
State of North Carolina	Notify	Notify(a)	Activate	Activate
Brunswick County	Notify	Notify(a)	Activate	Activate
New Hanover County	Notify	Notify(a)	Activate	Activate
USNRC	Notify	Notify	Activate	Activate
American Nuclear Insurers		Notify	Notify(a)	Activate
U. S. Coast Guard	(c)	(c)	Notify(a)	Activate
Dosher Memorial Hospital	(b)	(b)	(b)	(b)
Southport Volunteer Fire Department	(b)	(b)	(b)	(b)
Southport Volunteer Rescue Squad	(b)	(b)	(b)	(b)
General Electric	(c)	Notify(a)	Activate	Activate
INPO	(c)	Notify	Notify	Notify

(a) Mobilize, if deemed necessary.

(b) Request assistance, if required.

(c) Notify if deemed necessary.

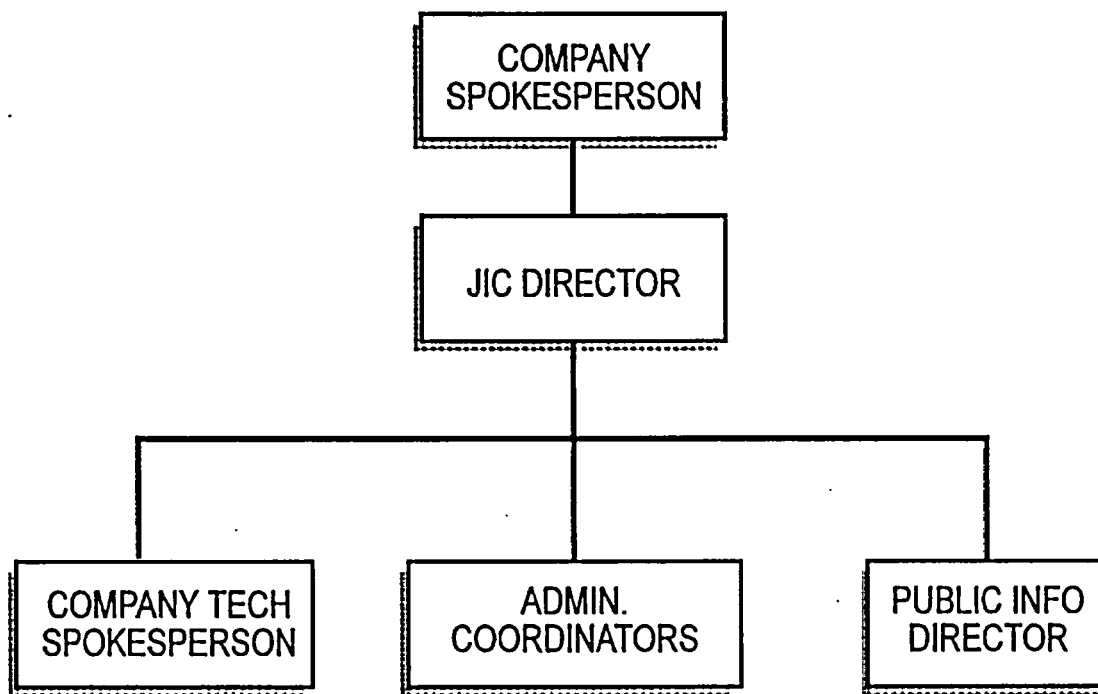


Figure 3.6-1 Joint Information Center (JIC)

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

4.0 EMERGENCY MEASURES

This section identifies the measures to be taken for each class of emergency described in Section 2. The measures presented in this section are used as the basis for the detailed Plant Emergency 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 activities are discussed in Section 7.

4.1 ACTIVATION OF EMERGENCY ORGANIZATIONS

4.1.1 General

The Plant Operating Manual contains Emergency Operating Procedures (EOPs). These are intended to aid the plant operators in responding to an accident. The EOPs identify actions which should automatically occur to safely terminate the accident and manual actions which should be taken to verify that the automatic actions have produced the desired results. The EOPs also provide, 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 OPEP-02.1, Initial Emergency Actions, the operators are instructed to activate the Emergency Plan.

The Shift Superintendent 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 Plant 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 on site and for the general public is contained in Appendix A of this plan and OPEP-03.1.3, Use of Communication Equipment.

4.1.2 Unusual Event

The Shift Superintendent, when informed of conditions that meet emergencies that are classified as an Unusual Event, confirms that an Emergency Action Level has been exceeded and implements OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency. He then is responsible for 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 on-site shift personnel by activating additional emergency personnel described in Section 3. Typical of the personnel that may be notified are E&RC, the Fire Brigade, and the Security Force.

4.1.3 Alert

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 has the potential for limited releases of radioactive material to the environment, off-site groups will be notified to standby so that if the emergency level is escalated, the essential off-site emergency organizational groups can be notified and readily mobilized to augment the on-site emergency groups.

Upon declaration of an Alert emergency classification the Shift Superintendent assumes the role of the Site Emergency Coordinator until relieved by a designated, qualified emergency response organization member. The transfer of Site Emergency Coordinator responsibilities from the Shift Superintendent occurs simultaneously with the activation of the Technical Support Center (TSC).

The Site Emergency Coordinator implements OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency, and notifies the appropriate individuals or groups.

The Site Emergency Coordinator initiates the activation of the Technical Support Center, Operational Support Center, and the Emergency Operations Facility (EOF). The radiological emergency teams will be activated, as appropriate.

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.

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 radiation releases that are projected to escalate beyond the Emergency Action Levels for an Alert.

4.1.4 Site Area Emergency

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

If not done earlier, the Shift Superintendent assumes the role of the Site Emergency Coordinator (SEC) until formally relieved. The SEC activates the necessary emergency organizations and directs that the essential emergency personnel be notified.

If they have not been previously requested to do so, the off-site groups will be mobilized as soon as possible; the Technical Support Center, Operational Support Center, and the Emergency Operations Facility will be activated. Radiation monitoring teams may be augmented to permit an expanded on-site and near site monitoring program.

The Joint Information Center will be activated for the purpose of providing information to the public.

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

4.1.5 General Emergency

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency. This includes arranging for personnel to be available, both on site and off site, to perform actions up to and including evacuation of the affected sectors of the 10-mile EPZ.

If not done earlier, the Shift Superintendent assumes the role of the Site Emergency Coordinator (SEC) until formally relieved. The SEC activates the necessary emergency 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. Recommendations will be made for sheltering and/or evacuation in accordance with the guidelines in OPEP-02.6.28, Off-Site Protective Action Recommendations.

4.2 ACCIDENT ASSESSMENT ACTIONS

4.2.1 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 off-site, depending on the nature and severity of the emergency.

The magnitude of releases of radioactive material can be determined using 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 for other locations. These doses can then be compared to Protective Action Guides. The various steps in this process are discussed in the following sections and in the Plant Emergency Procedures. In the absence of measurable off-site dose rates, protective action recommendations will be made based on the guidelines OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

4.2.2 Source Term Assessment

Source terms for assessment of off-site dose consequences to the public can be determined by using effluent and radiation monitor readings, evaluating plant conditions against predetermined scenarios, using analysis results of plant effluent samples, and by manually estimating curie inventories. A thorough discussion of source term development is provided in Appendix F.

4.2.2.1 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 monitors the airborne gaseous and particulate activity released from the Reactor Building and Turbine Building. Additional channels of the radiation monitoring system also monitor the gaseous activity in the air ejectors, primary containment (drywell atmosphere) ventilation system, and main steam line monitors. These channels indicate, record, and alarm in the main control room. The radiation monitoring system gives early warning of a plant malfunction and warns plant personnel of increasing radiation activity which might result in a radiation health hazard. (See OPEP-03.6.3 for procedures on source term assessments and estimates of core damage.)

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 systems 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 Superintendent on duty would be 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 off-site release.
6. The Plant Emergency Procedures would be activated if an emergency is declared.

4.2.2.2 Potential Consequences Based on In-Plant Conditions

The source term can be estimated by evaluating the plant condition against a number of preselected scenarios that best describes the effectiveness of containment, cleanup systems, subcooled, or saturated conditions in the torus, and other relevant parameters. A more thorough discussion of the determination of source terms from plant conditions is described in Appendix F.

4.2.2.3 Post Accident Sampling and Analysis of Reactor and Containment

To aid in the assessment of core damage, area-type monitors utilizing ion chamber detectors are available to monitor radiation levels in the drywell. These monitors have a range of up to 10^7 Rem/hr. The range of monitoring equipment in various locations of the plant has also been extended (e.g., high range noble gas vent monitor and improved procedures for iodine analyses). This information can be used, together with the analyses of primary coolant system contamination levels, to develop an assessment of the types and quantities of various materials that have been released.

Additionally, capabilities have been provided to permit sampling for chemical and radioanalysis under a wide range of accident conditions. Samples can be taken from effluent streams such as the plant stack to determine total release quantity and radionuclide mix, or they can be taken from the RCS, drywell, and torus to determine radionuclide mix. The collection and analysis of samples can be performed without incurring radiation exposures to individuals in excess of 10CFR20.1201 limits.

The procedures for obtaining samples of gases and liquids during normal operation (such as a sample of primary coolant) can also be safely used during a wide spectrum of accident conditions. However, there are 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 and equipment has been installed at the sample panels to minimize the time required to obtain samples and to reduce the radiation levels during transport and analysis of samples. Beyond these measures, post accident sampling stations are located in the breezeway on the 20-foot level. This permits the collection of samples even if access to the Reactor Building is lost. This station can be used to safely withdraw samples of reactor coolant from the recirculation instrument racks in parallel with the jet pump flow indicator and to withdraw samples of water in the torus.

4.2.3 Dose Projection and Meteorological Systems

Once the source term is estimated, exposures to on-site and off-site individuals can be estimated as described in OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures. The technical basis for the methodology for performing dose projection is described in Appendix F. Prior to receipt of information from the emergency radiation monitoring teams, exposure rates at various locations on site and off site 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 and wind velocity, are used to determine the atmospheric dispersion conditions. Normally, the plant computer will provide a readout of the stability condition, but alternate methods are available. Rapid evaluation of potential radiation levels of any downwind area can be made through the use of calculated dispersion factors and the calculated release rate of airborne radioactive material from the plant.

The Brunswick Nuclear Plant has an on-site 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 5.7.2.

Currently, the BNP staff has an automated dose projection capability as described in OPEP-03.4.7, Automation of Dose Projection Procedures. By entering critical plant data and meteorological information obtained from the on-site meteorological station, dose projections can be made for various locations using the dose assessment program. This function has been designed and implemented to allow for the rapid determination of centerline doses for immediate use by plant personnel.

Additionally, contract meteorologists are to be contacted by plant personnel.

Meteorological data display is available for remote interrogation as part of the Emergency Response Facility Information System (ERFIS). This satisfies the NUREG 0654, Rev. 1 criteria for meteorological evaluation and remote interrogation.

4.2.4 Emergency Environmental Monitoring

The Site Emergency Coordinator 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 off-site monitoring is to confirm or modify the initial projections of the consequences of any release of radioactive material into the environment.

The Environmental Monitoring Teams collect samples and survey data and transmit information to and/or receive instructions from the Radiological Control Manager of the EOF staff (or Radiological Control Director, if the EOF is not activated).

Calculational aids, site maps, and actual radiation survey data collected by off-site survey teams define affected areas and assess the extent and significance of the release. 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 off-site consequences including estimates of total population exposure and instituting an expanded program to enable prompt assessments of any subsequent releases from the plant. Progress Energy Environmental Monitoring Teams will coordinate expanded environmental monitoring efforts to assist the agencies identified in Section 3.8. Field monitoring equipment will have at least the capability to detect and measure radioiodine in the vicinity of the plant site as low as $5 \times 10^{-8} \mu\text{Ci}/\text{cm}^3$. 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). 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 by the Emergency Response Manager, if conditions warrant their deployment. Additional teams from the Harris Nuclear Plant and the Robinson Nuclear Plant may be requested, if needed.

4.2.5 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. 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 re-establish the ERDS link automatically through the communication port for ERDS.

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 Operating Manual. 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 6.1.1.

4.4 PROTECTIVE ACTIONS

Protective actions are defined for each emergency class. 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 whole body (TEDE).

Protective action recommendation guidelines for the general public are described in OPEP-02.6.28, Off-Site Protective Action Recommendations. Protective actions planned for on-site personnel are described in Section 4.4.2. Protective actions for the off-site population-at-risk are the responsibility of state and local agencies; however, representative actions at various dose levels are described in Section 4.4.7. The evaluation of Protective Action Guidelines for the intermediate phase and for ingestion pathways are the responsibility of the state.

4.4.1 Protective Action - Off Site

Notification of off-site agencies will take place when EALs are exceeded (see Section 3.9). Any incident that is projected to result in radiation doses to the general public in excess of the Protective Action Guidelines listed in OPEP-02.6.28, Off-Site Protective Action Recommendations, requires the Site Emergency Coordinator to declare a General Emergency. The Emergency Response Manager will recommend to the state and counties protective measures for the public.

4.4.2 Protective Action - On Site

4.4.2.1 Warning and Notification

The on-site PA system and appropriate alarms will be used to alert/warn and notify on-site personnel of an emergency and necessary protective actions as described in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency. In addition to the alarms, PEPs and security instructions provide guidance for on-site warning and notification. 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 4.4.6 for the public.

4.4.2.2 Evacuation & Personnel Accountability

For emergencies requiring protective actions in accordance with OPEP-03.8.2, Personnel Accountability and Evacuation, personnel will proceed by the safest, most direct route to the designated assembly locations or as directed by the Site Emergency Coordinator.

- a. Shift operating personnel will assemble in the Control Room.
- b. All personnel not specifically involved in responding to the emergency (non-essential) will assemble as directed.
- c. All visitors will report to the Security Office at the protected area central access control point.

A personnel accountability check will be carried out in accordance with OPEP-03.8.2, Personnel Accountability and Evacuation, 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 OPEP-03.9.2, First Aid and Medical Care, and OPEP-03.9.3, Transport of Contaminated Injured Personnel.

Search for missing persons and rescue will be performed as described in OPEP-03.9.6, Search and Rescue.

On-site personnel will evacuate the area when directed using transportation that was employed to arrive at the site. Personnel without transportation will be identified during the assembly phase and provided transportation.

The secondary access road and the main plant access road will be used to depart from the site as advised, and evacuation from the 10-mile EPZ will be by way of evacuation routes identified in Figures 1.1-1, 1.1-2, and 4.4-1.

4.4.3 Control of Personnel Radiation Exposures

Although an emergency situation transcends the normal requirements for limiting exposures to ionizing radiation, guideline levels are established in OPEP-03.7.7, Onsite Radiological Controls, for exposures that may be acceptable in emergencies. The maximum whole body (TEDE) dose received by any worker should not exceed established regulatory limits. Every reasonable effort will be used to ensure that an emergency is handled in such a manner that no worker exceeds these limits.

The administration of radioprotective drugs such as potassium iodide (KI) to Progress Energy personnel may also be useful in mitigating the consequences of inhalation of radioactive materials such as radioiodines during an emergency.

Procedures for the administration of radioprotective drugs to Progress Energy and vendor employees are described in OPEP-03.7.6, Emergency Exposure Controls.

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 exposure effects are:

1. Up to 50 Rem EDE in 1 day - no physiological changes are likely to be observed.
2. 50 to 100 Rem EDE - no impairment likely but some physiological changes, including possible temporary blood changes, may occur. Medical observations would be required after exposure.
3. 100 to 300 Rem EDE - some physical impairment possible. Some lethal exposures possible.

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

4.4.3.1 Exposure Control Under Emergency Conditions

Dose limit guidelines for workers in an emergency are taken from EPA 400-R-92-001, Manual of Protective Actions and Protective Action Guidelines for Nuclear Incidents, U. S. Environmental Protection Agency, May 1992. Much of the discussion in this section is taken in whole from that document.

In emergency situations, workers may receive exposure under a variety of circumstances in order to assure protection of others and of valuable property. These exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected.

The Emergency Worker Dose Limit Guidelines are as follows:

Dose Limit (Rem TEDE) ¹	<u>Activity</u>	<u>Condition</u>
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

Routine dose limits shall not be extended to emergency dose limits for declared pregnant individuals. As in the case of normal occupational exposure, doses received under emergency conditions should be maintained as low as reasonably achievable.

¹Doses 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.

In the context of these guidelines, exposure of workers that is incurred for the protection of large populations may be considered justified for situations in which the collective dose avoided by the emergency operation is significantly larger than that incurred by the workers involved.

Persons undertaking any emergency operation in which the dose will exceed 25 Rem TEDE should do so only on a voluntary basis and with full awareness of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effect.

4.4.3.2 Exposures During Repair/Reentry Efforts

Each emergency worker entering a high radiation area shall wear 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 Health Physics Technician, 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 communicate with the OSC Mission Coordinator 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.

4.4.4 Radioactive Contamination

4.4.4.1 On-Site Personnel

Radiation safety controls are established to contain the spread of loose surface radioactive contamination. Personnel leaving the contaminated areas are monitored to ensure that they or their clothing are not radioactively contaminated. Additionally, in the event of a site evacuation, no personnel will be allowed to leave the plant site until they have been checked for contamination. In addition to the decontamination area of the Service Building, additional areas can be set up inside the entrance to the TSC/EOF Building.

Contaminated clothing or personal articles will be decontaminated. 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 E&RC procedures. If normal decontamination procedures do not reduce contamination to acceptable levels, the case will be referred to a competent medical authority.

4.4.4.2 Equipment and Vehicles

Equipment and tools will be released for use outside of the contaminated areas only if loose surface radioactive contamination is within acceptable 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, vehicles will be surveyed for contamination before they are allowed to leave the plant site. Contaminated vehicles will be decontaminated before being released. If the Low Level Radwaste Warehouse is not a suitable decontamination site due to radiological concerns, vehicles will be directed to an alternate area for decontamination. Brunswick County Emergency Management may provide assistance in this area.

4.4.5 Treatment of Injured and Contaminated Persons

Personnel showers and chemical decontamination agents are available on site and, except in cases of life-threatening/serious injury, established decontamination procedures will be employed on site prior to medical treatment. Decontamination showers and supplies are provided in the Service Building. Shower and sink drains in the Service Building are routed to the miscellaneous waste processing system where the liquid is processed and monitored prior to discharge.

Arrangements and facilities for medical treatment of injured plant personnel are described in detail in Appendix E - Medical Treatment and Assistance and in OPEP-03.9.2, 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 (see OPEP-03.9.3, Transport of Contaminated Injured Personnel).

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.

Definitive medical treatment, therapy, and evaluation may include radioprotective drugs, urinary bio-assays 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.

4.4.6 Public Warning and Notification

In the event of an emergency, the plant will notify designated emergency officials in Brunswick and New Hanover counties as well as state and federal officials in accordance with OPEP-02.6.21, Emergency Communicator.

During the ALERT phase of an emergency, the appropriate county and state emergency group leaders will be requested to remain in a readiness condition to alert the population at risk if needed. 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 in the North Carolina Emergency Response Plan In Support of the BNP. Warning will be given by such methods as sirens supplemented by radio, television, sound trucks, bullhorns, and knocking on doors. The Coast Guard will be used in notifying people along the coast and other large bodies of water where appropriate and necessary.

Sirens mounted on utility poles have been installed by Progress Energy at 36 locations within a 10-mile radius of the Brunswick Nuclear Power Plant. Since the average ambient noise level throughout the EPZ is about 49dBA, the siren system is planned to provide a 59dBA minimum signal. The warning signal will be a 3-to-5-minute steady tone on the sirens.

Sirens will not be sited in the Sunny Point Army Terminal. Brunswick County will notify the terminal which will alert its personnel using on-site warning methods.

Sirens will not be sited in areas of no population. Large areas of Brunswick County consist of swamps and forests with no population. These areas include such tracts as the Orton Plantation, the western section of Boiling Springs Lakes, and some areas south of Route 211. These tracts are often owned by a few local individuals or lumber companies. Based on land use history, they show little promise of development. However, the warning system will be reviewed annually and upgraded when conditions warrant.

Activation of the sirens will be accomplished from the Brunswick and New Hanover Counties Emergency Operation Centers. The sirens in each county are independently controlled, but may be activated by Progress Energy with permission from the counties. A feedback system immediately alerts Progress Energy and both counties of any siren failure. The U.S. Coast Guard will perform the warning of people on bodies of water under their jurisdiction.

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 Brunswick Nuclear Power Plant Evacuation Time Estimates For The Plume Exposure Pathway Emergency Planning Zone, prepared by PBS&J, November 2002. The total resident population affected within the 10-mile EPZ is approximately 26,724. During the summer months, June through August, the daytime population of the EPZ is approximately 147,054 (see Figure 1.1-6). The population is concentrated along the coast and a relatively few inland roads.

4.4.7 Protective Actions - Off Site/Public

4.4.7.1 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.

This will be accomplished by: (1) distribution of the annual safety information brochure which contains educational information on emergency preparedness, sheltering, sirens, radiation, and 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 safety information brochures to commercial establishments in the 10-mile EPZ.

During an actual emergency, provisions will be established through the Joint Information Center to make available and distribute information to the news media. The Joint Information Center will also 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 6.1.4.

4.4.7.2 General

For emergencies requiring protective actions for the general public in designated off-site 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 will be compared to the protective action guidelines.

The protective actions that Progress Energy recommends to the state will be based upon current meteorological data such as wind direction, speed and stability class, and other factors.

Releases affecting off-site areas may not be of the magnitude requiring evacuation, areas within the 10-mile EPZ that do not evacuate will be recommended to shelter.

Detailed procedures for public protective actions are contained in the North Carolina Emergency Response Plan in Support of BNP.

4.4.7.3 Evacuation

In the event that evacuation of the 10-mile EPZ is required, the evacuation routes shown in Figure 1.1-2 and Figure 4.4-1 will be used by on-site and off-site 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 Figure 4.4-1 and on other factors as shown in Table 4.4-1.

It should be noted that the evacuation process in itself involves risk to the public. Risks resulting from evacuation are discussed in US EPA Report, EPA 400-R-92-00, Appendix C.

4.4.7.4 Shelter

All sectors that are not recommended to evacuate will be recommended to shelter. The state may consider sheltering for special populations or hazardous environmental conditions. Special populations may include institutionalized or infirm persons. Hazardous environmental conditions may include the presence of severe weather or competing disasters.

The local housing consists primarily of wood framed dwellings, 1 and 2 stories, that are over 10 years old. Very few houses have basements. There are a number of brick veneer dwellings of later construction and a fairly small even distribution of house trailers.

The term Protection Factor (PF) refers to a number used to express the relationship between the amount of gamma radiation that would be received by an unprotected person and the amount that would be received by a person in shelter. An occupant of a shelter with a PF of 40 would be exposed to 1/40 (2.5 percent) of the dose or dose rate to which he would be exposed if his location were unprotected (Sheltered Dose = Unsheltered Dose ÷ PF).

Protection factors for various shielding materials are given in Figure 4.4-3 and for various structures and vehicles in Tables 4.4-2, 4.4-3, and 4.4-4.

4.4.7.5 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 4.4-1

FACTORS RELATED TO WARNING/EVACUATION TIME

1. Facility to Off-site 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 I
 - b. Shutting off utilities I
 - c. Packing bags I
 - d. Deciding on destination and routes I
 - e. Taking care of livestock, etc. I
 - f. Collecting other family members I
 - g. Loading the automobile and departing I
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 4.4-2
REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED
RADIONUCLIDES*

Structure or Location	Representative Shielding Factor ^(a)	Representative Range
1 m above ordinary ground	0.70	0.47-0.85
Cars on 50-ft. road:		
Road fully contaminated	0.5	0.4-0.7
Road 50% decontaminated	0.5	0.4-0.6
Road fully decontaminated	0.25	0.2-0.5
Trains	0.40	0.3-0.5
One- and two-story wood-frame house (no basement)	0.4 ^(b)	0.2-0.5
One- and two-story block and brick house (no basement)	0.2 ^(b)	0.04-0.40
House basement, one or two walls fully exposed:	0.1 ^(b)	0.03-0.15
One story, less than 2 ft of basement, walls exposed	0.05 ^(b)	0.03-0.07
Two stories, less than 2 ft. of basement, walls exposed	0.03 ^(b)	0.02-0.05
Three- or four-story structures, 5000 to 10,000 ft ² per floor:		
First and second floors	0.05 ^(b)	0.01-0.08
Basement	0.01 ^(b)	0.001-0.07
Multistory structures, > 10,000 ft ² per floor:		
Upper floors	0.01 ^(b)	0.001-0.02
Basement	0.005 ^(b)	0.001-0.015

- (a) The ratio of dose received inside the structure to the dose that would be received outside the structure.
(b) Away from doors and windows.
(c) Shielding Factor = Shielded Dose Rate / Unshielded Dose Rate

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

TABLE 4.4-3
REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE

Structure or Location	Shielding 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.

(c) 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 4.4-4
PF OF VARIOUS VEHICLES AND STRUCTURES

	<u>Average PF</u>
<u>Aircraft</u> Light (Cessna - 172 type)	1.25
<u>Bus</u> - Scenic Cruiser	7
" - Commercial Type	1.7
" - School	1.6
<u>Car</u> - Passenger	1.6
<u>Foxhole</u> (3 ft. diameter x 4 ft. deep)	10.0

If an area 3 or 4 feet wide around the foxhole is kept free of fallout material, a protection factor of 100 or more is possible.

House, Wood Frame (Cape Cod/Colonial Types)

First Floor Center of House	2.0
Basement	10.0
Corner of Basement, Under Table with 8"	100.0
Concrete on top	100.0

House, Brick (Cape Cod/Colonial Type)

First Floor Center of House	10.0
Basement	30.0

Locomotive, Heavy, Engineers Seat

3.3

Normal Living, Home and Work as Usual

2.0

Trucks

1/4 Ton	1.3
3/4 Ton	1.4
2 1/2 Ton	1.7
4 to 7 Ton	2.0
Fire Truck, Drivers Side	2.9
Fire Truck, Standing Area in Back	1.7

Roadway Underpass

2 to 5

Urban Areas (In Open)

1.4

Woods

1.25

NOTE: Protection Factor (PF) = Unshielded Dose Rate ÷ Shielded Dose Rate. Above data pertains to deposited particulate radioactive material with gamma energy approx. 0.7 mev.

BNP EVACUATION SCHEDULE AND WARNING

EVACUATION SCHEDULE					POPULATION	
Zone	Warning Responsibility	Evacuation Routes	Evacuation Shelter	Warning time hrs/mins	Permanent	Peak Transient Seasonal
A	Southport Fire/Rescue Sunset Harbor Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	Leland Middle School	0 + 39	1,542	932
B	Southport Fire/Rescue	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School Leland Middle School	0 + 18	1,609	16,387
C	Southport Fire/Rescue	NC 133 north, SR 1472 (old US 74/76) west, SR 1455 north	Lincoln Primary School	0 + 19	787	1,335
D	Oak Island Fire/Rescue/Police Yaupon Beach Fire	NC 211 west, US 17 south, NC 130 north	West Brunswick High School	0 + 32	9,297	32,422
E	Bolivia Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437 SR 1500 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School	0 + 29	2,077	745
F	Boiling Springs Fire/Rescue Bolivia Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School	0 + 41	3,193	1,204
G	Boiling Springs Fire/Rescue Town Creek Rescue	NC 133 north, SR 1437	North Brunswick High School	0 + 43	890	64
H	Southport Fire/Rescue	NC 133 north, SR 1472 (old US 74/76) west, SR 1455 north	Lincoln Primary School	0 + 30	818	1073
K	Carolina Beach Fire/Rescue Kure Beach Fire Federal Point Fire New Hanover County Sheriff	Dow Road, US 421 north, NC 132 north	Trask Coliseum, UNC-W Roland-Grise Jr. High School ⁶ Hoggard High School ⁶ Alderman Elementary School ⁶	0 + 30	6,511	55,517
1. Bald Head Island authorities will warn the population in the Bald Head Island development. 2. If time is critical, after zones using NC 87 and NC 133 have cleared, two traffic lanes would be directed out of Zone D with one lane using NC 87 or NC 133 north. 3. Sunny Point Army Terminal, Orton Plantation, and Old Brunswick Town/Fort Anderson authorities will warn the population within their jurisdiction. 4. If time is critical, three lanes of traffic could be directed out of Zone K on US 421 north from the point where Dow Road intersects US 421. 5. These shelters are available only on days when school is not in session.						

See also Figure 1.1-2, 10 Mile Plume Exposure EPZ.

Figure 4.4-1 Evacuation Schedule and Warning

EVACUATION TIMES - BRUNSWICK EPZ

<u>Analysis Area</u>	<u>Local Planning Zones Evacuated</u>	<u>Evacuation Time (minutes)^{a,b}</u>
1	B	115-314
2	A,B,C	160-381
3	A,B,C,D	290-662
4	A,B,C,D,E	296-670
5	A,B,C,D,E,F,G,H	340-695
6	A,B,C,E,F,G,H,K	235-749
7	A,B,C,G,H,K	235-749
8	A,B,C,H,K	235-749
9	A,B,C,K	340-749
10	A,B,C,D,E,F,G,H,K	340-749

- a This range of evacuation times covers four conditions:
Fair Weather - winter weekday, winter weeknight, summer weekday and summer weekend; and Adverse Weather - winter weekday and summer weekend.
- b Evacuation time includes public alerting and notification (15 minutes), preparation for movement (15 minutes), and time to travel out of the local planning zone(s) being evacuated.

Figure 4.4-2 Evacuation Times

PROTECTION FACTOR

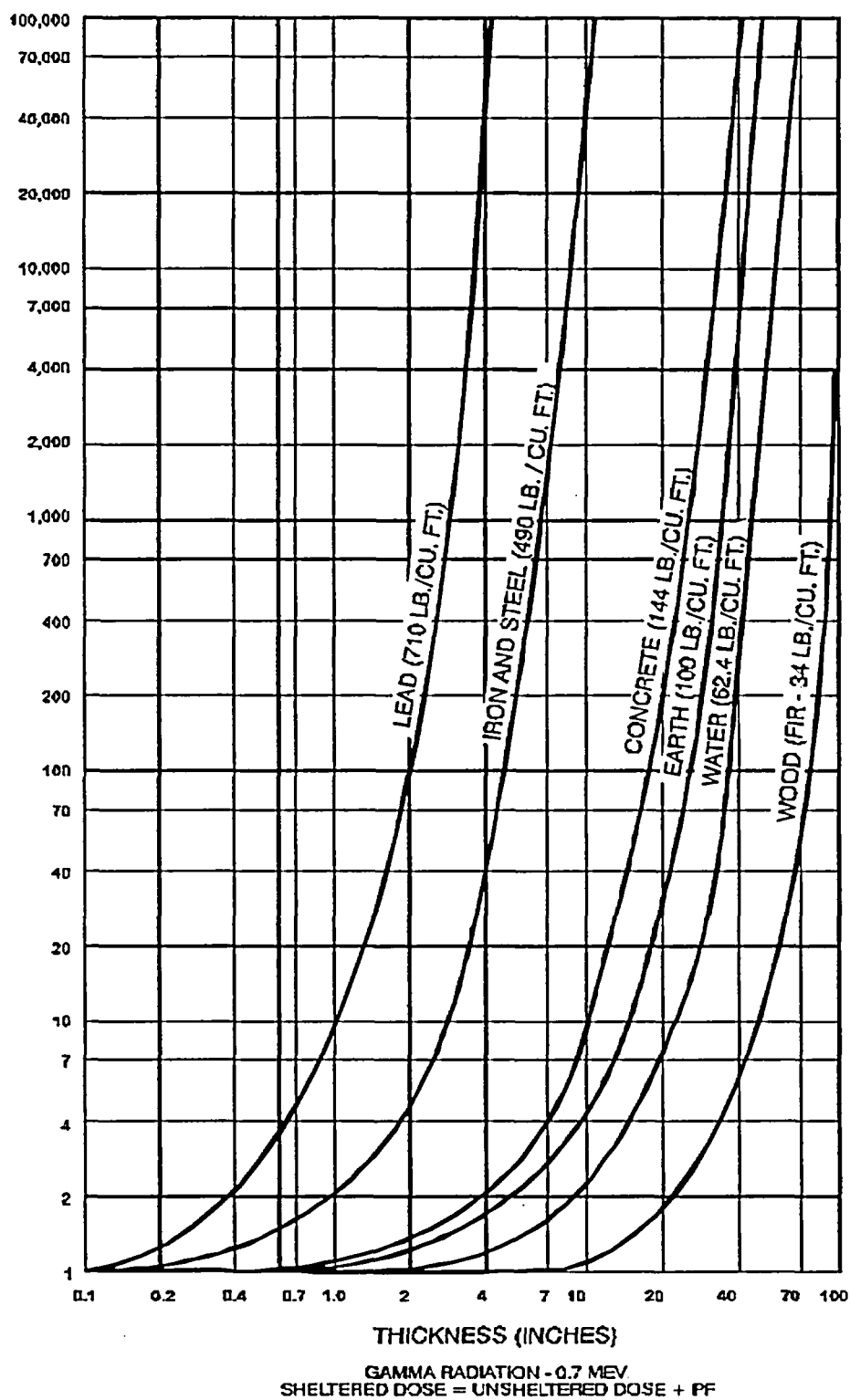


Fig. 4.4-3 Protection Factors of Shielding Materials

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

5.0 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 Brunswick. 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, fiber optic, Progress Energy microwave net, data links, and radio to provide: (a) voice communication through normal telephone use, automatic ringdown between selected facilities, conference call capability, speaker phones and operator assistance where required; (b) radio communications between selected Progress Energy vehicles and appropriate fixed locations, as well as with state mobile units and fixed locations; (c) facsimile and computer local and wide area networks. (A detailed listing of the Brunswick emergency communications systems is presented as Appendix A.)

The purpose of emergency response facilities is to provide centralized locations for organized coordination and control of on-site and off-site activities during an emergency. Each emergency response organization must assure that a location is provided from where they may direct the activities for which they are responsible, while providing for coordination of activities with other organizations.

Facilities are needed to function as a center for the licensee's command and control functions of on-site operations, including coordination of all licensee activities, on site and off site. Also needed is a center for the analysis of plant effluent monitors, meteorological conditions, and off-site radiation measurements, and for off-site dose projections. As discussed in Section 3 additional facilities are needed where information regarding current and projected plant status needed by federal, state, and local authorities for implementation of off-site emergency plans can be transmitted, where key representatives of the agencies can meet and where the press can operate.

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 Joint Information Center, and the State and Local Emergency Operations Centers. These centers are connected with a comprehensive, redundant communications network.

In the emergency facilities, decisions and responses are based upon approved procedures and controlled drawings. Uncontrolled drawings and other documents may be used for reference if identified with "FOR INFORMATION ONLY" or "FOR TRAINING USE ONLY." Material identified as "FOR INFORMATION ONLY" or "FOR TRAINING USE ONLY" will not be used in place of approved procedures or controlled drawings.

The functional capabilities of the Brunswick emergency facilities are presented in Table 5.0-2, and the physical locations of on-site emergency facilities are shown on Figure 1.1-3. Specific information about the facilities and equipment available for dealing with emergencies at Brunswick is presented in the following sections.

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 Brunswick 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 reactors and turbine generators under normal and emergency situations.

Additional equipment such as portable radiation survey instruments, readout of meteorological instrumentation and communication equipment is 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.

5.2 TECHNICAL SUPPORT CENTER

The Technical Support Center (TSC) provides a location to house personnel who are responsible for management and technical support of plant operations during emergency conditions. The TSC also functions to relieve the Control Operators of peripheral duties and communications not directly related to reactor system manipulations and preventing congestion in the Control Room. In the event of a loss of power, an auxiliary diesel generator is located near the building to supply an alternate source of power.

The TSC will be activated for an alert or higher classification. Activation for an unusual event is optional.

If it should become necessary to expedite travel between the TSC and Control Room, Security has provisions in place to provide direct access between the TSC and the protected area.

The TSC and EOF share a common building which has been designed to have the same habitability as the Control Room. The north wall is 18 inches thick and the other walls and roof are 14 inches thick. The ventilation system is described in Section 5.2.1.

5.2.1 TSC/EOF EMERGENCY VENTILATION SYSTEM

The EOF/TSC Building Ventilation System is equipped with two (2) filter systems (containing both HEPA and charcoal filters), one for each of the two ventilation intake locations (Mechanical Rooms 134 and 165). The TSC/EOF Building Ventilation System is equipped with two intake air monitors which are Eberline SRM-100 monitors with SPA-8 probes. The probes are installed in the intake air ducts where detection of a high level of radiation can automatically trigger the HVAC system to actuate emergency fans to direct intake air through the filter trains.

The intake air radiation monitors are provided with an audible local alarm that is located on the radiation monitor. When the alarm setpoint is reached, the monitor will energize its associated radiation monitor relay, which will automatically activate an emergency fan to redirect the intake air through the associated filtering system.

5.2.2 TSC/EOF EMERGENCY CONTAMINATED DRAIN SYSTEM

During an emergency, contaminated drainage could occur at the decontamination shower. An emergency drain system is provided to isolate potential contaminated drainage which can be collected in a 1,000 gallon holding tank. For normal operating conditions, all drainage would be collected by the sanitary drain lines. The holding tank is located underground on the west side of the building. Manually operated valves allow the rerouting of potentially contaminated liquid to the 1,000 gallon holding tank.

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 plant maintenance, operations, E&RC, and other plant emergency support personnel will assemble and stand by to assist as needed. The Operational Support Center is located in the O&M Building.

When the OSC is activated, dosimetry, respiratory protection, radiation survey equipment, and RWPs will be provided. In the event of a personnel contamination, decontamination will be performed in the area normally designated for this purpose. In the event the OSC is evacuated, a backup can also be provided in the Simulator. The Simulator is within the habitability envelope of the TSC/EOF.

5.4 EMERGENCY OPERATIONS FACILITY

The Emergency Operations Facility (EOF), located on site provides space for management of overall emergency response including coordination with federal, state, and local officials, coordination of off-site radiological and environmental assessment, and determination of recommended public protective actions. The EOF is activated at an alert or higher level. The EOF is in the same habitability envelope as the TSC.

If radiological conditions prevent EOF personnel from traveling to the EOF for activation, the Brunswick County Complex in Bolivia, N.C. will serve as a meeting place for personnel until radiological conditions permit travel to the facility. The Brunswick County Complex may also be used as an alternate reporting location for TSC, OSC, and EOF personnel in the event of a security threat, and function as an alternate EOF, until safe movement of personnel to the plant is assured.

5.5 JOINT INFORMATION CENTER

The Joint Information Center (JIC), located in the Brunswick Community College Complex near Bolivia, N.C., will serve as the primary location for the accumulation of accurate and current information regarding emergency conditions, and dissemination of information to news media and the general public. The JIC Communications Network has back-up capability for telephone and radio functions. Work stations are provided for Company personnel and a media briefing room is available. Telephones are provided for use by news media personnel. The center also contains work space and phones for public information personnel from the state, counties, NRC and industry-related organizations. Additional information can be found in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

5.6 OFF-SITE EMERGENCY FACILITIES

5.6.1 North Carolina Emergency Operations Center

The North Carolina Emergency Operations Center (EOC) is located in Raleigh, North Carolina. When necessary, it will be activated and staffed to assist in coordinating emergency operations in support of the Brunswick Nuclear Plant.

5.6.2 Brunswick County Emergency Operations Center

The Brunswick County Emergency Operations Center is located in the Brunswick County Administration Complex in Bolivia, North Carolina, about fifteen miles from the Brunswick site. It provides a location where Brunswick County authorities can direct off-site activities in Brunswick County. If radiological conditions prevent EOF personnel from traveling to the EOF for activation, the Brunswick County Complex in Bolivia, N.C. will serve as a meeting place for personnel until radiological conditions permit travel to the facility. This facility presently has direct communications links with the Brunswick Nuclear Plant TSC and EOF, and will allow free interchange of information between government officials and those persons located in the TSC and EOF responsible for dose projection and management decision making. The Brunswick County Complex may also be used as an alternate reporting location for TSC, OSC, and EOF personnel in the event of a security threat, and function as an alternate EOF, until safe movement of personnel to the plant is assured.

5.6.3 New Hanover County Emergency Operations Center

The New Hanover County Emergency Operations Center is located in the New Hanover County Law Enforcement Center in Wilmington, North Carolina, about 20 miles from the Brunswick site. It provides a location where New Hanover County authorities can direct off-site activities in New Hanover County. This facility presently has direct communications links with the Brunswick Nuclear Plant TSC and EOF, and will allow free interchange of information between government officials and those persons located in the TSC and EOF responsible for dose projection and management decision making.

5.7 ASSESSMENT CAPABILITIES

5.7.1 General

The instrumentation and control systems monitor, provide indication and recording, and 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 at locations convenient to the operator. This instrumentation, in conjunction with projected off-site doses, provides the basis for initiation of protective actions.

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5.7.2 Meteorological Instrumentation and Procedures

The Brunswick Nuclear Plant 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 system. The meteorological parameters measured on the tower at the 10-meter and 100-meter levels above ground are listed in Table 5.7-1. In addition, barometric pressure, solar radiation, precipitation and dew point temperature data are recorded at the station to provide supplemental information on local meteorological conditions. This information is remotely interrogatable using a computer or other data access terminal.

The meteorological sensors used at the BNP meteorological monitoring station are calibrated at least twice during an annual calendar year (approximately six months between calibrations). Meteorological sensors which are removed from service are replaced with a recalibrated unit having met original equipment manufacturer specifications. Between calibrations, an electronic verification of system performance will be made and, if necessary, adjustments to the system will be performed. This electronic verification shall be performed at least once between calibrations. BNP 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 a meteorological service provider, where the data is reviewed by the meteorological staff to determine system performance and the acceptability of the reported information. Historical records and data will be maintained with the Environmental Unit for effluent reporting.

The meteorological instrumentation which Progress Energy uses at the BNP meteorological monitoring station meets the requirements of NRC Regulatory Guide 1.23 (Rev. 0) and provides the meteorological parameters to the locations specified within NRC Regulatory Guide 1.97 (Rev. 2), Table 1 and Table 2. As specified within Section 8.2 of the Supplement Number 1 to NUREG-0737, Progress Energy maintains telephone numbers for voice communications to the nearest National Weather Service, first order observation station (Wilmington, NC) for twenty-four hour per day access to this backup meteorological information should the on-site system fail. This backup source of meteorological data is the closest location which can provide reliable representative meteorological information for the BNP site.

Should the on-site meteorological data collection system exhibit suspect information, loss of data due to computer or instrument failure, or plant personnel require additional technical assistance, meteorologists are available to provide needed expertise. Meteorologists can independently access on-site meteorological data, contact the National Weather Service to obtain additional synoptic scale weather data and compile a site specific atmospheric diffusion assessment for BNP site.

5.7.3 Seismic Monitoring

The Brunswick Seismic Monitoring System senses and records earthquake ground motion received in two areas of the Reactor Building.

The system is comprised of the following components:

1. Two peak shock recorders - remote sensing devices.
2. One multichannel accelograph - Model SMA-3.
3. One magnetic tape play-back unit - Model SMP-1.

The peak shock recorders measure and record the acceleration of the structure, primarily the concrete floors adjacent to the Reactor Building equipment drain tank and at the refueling elevation. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, will be recorded at the remote location as well as by the accelograph located in the electronic equipment room. The Seismic Monitoring System remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits and tape transports.

The peak shock recorder senses and permanently records the information defining a response spectrum. It also provides signals for immediate remote indication that specific preset response accelerations have been exceeded.

A considerable array of seismometers is located in the region. A central point of contact to obtain information about a seismic event is the National Earthquake Information Center in Golden, Colorado.

5.7.4 Radiological Monitors

The radiation monitoring system 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 four subsystems:

1. Process radiation monitoring system monitors various fluid streams in operating systems.
2. Area radiation monitors that monitor radiation levels at various locations within the operating area that can be read in the Control Room.
3. Continuous air monitors measure airborne particulate and/or airborne iodine activities at various locations within the operating areas.
4. Radiation monitoring equipment with readouts in various plant locations and the HP office.

The types, ranges, and locations of monitors are listed in Tables 5.7-2 to 5.7-4. Typical portable radiation monitors are listed in Table 5.7-4. The radiation monitors are designed to permit monitoring of activity releases during a broad spectrum of postulated emergency situations.

The locations of the off-site and on-site environmental monitoring stations, and the location of the emergency TLD monitoring stations are contained in plant Environmental and Radiation Control Procedures.

5.7.5 Process Monitors

Instrumentation used to monitor vital plant parameters is described in Section 7 of the Brunswick FSAR. This instrumentation is continuously monitored in the Control Room. Essential process monitoring (Critical Plant Variables) will also be available in the Technical Support Center.

5.7.6 Laboratory Facilities

Support of the radiation monitoring and analysis effort is provided by an on-site laboratory. The on-site 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 (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 Brunswick samples can be provided by laboratory facilities at the Harris Nuclear Plant, including the Harris Energy and Environmental Center (HEEC) located near New Hill, North Carolina, and by the Robinson Nuclear Plant located in Hartsville, South Carolina.

As described in the State of North Carolina Radiological Emergency Response Plan, the Division of Radiation Protection maintains a mobile radiological laboratory.

The NRC mobile laboratory may be made available for site and general emergencies. Parking space for the mobile laboratory is reserved on the southeast corner of the fabrication shop (old firehouse). The building is located on the north side of the plant, west of the Rad Material Container Storage Building. A 120 VAC receptacle box is mounted on the east exterior wall and is reserved for the mobile laboratory. The Radiological Control Director shall coordinate setting up of the mobile laboratory.

5.7.7 Dose Projection

The magnitude of releases of radioactive material can be determined from effluent and process monitors based on OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures. Additionally, an independent confirmation of the magnitude of a release can be obtained by environmental monitoring as described in OPEP-02.6.6, Environmental Monitoring Team Leader and OPEP-03.5.5, Environmental Monitoring and Plume Tracking. Given a source term, or the duration and rate of release to the environment, and meteorological data previously described, the Control Room can make the initial dose projections and is capable of performing this function on a 24-hour-per-day basis. After activation of the EOF, the Radiological Control Manager described in Section 3.5.4 is responsible to the Emergency Response Manager for determining dose projections from readily available data. OPEP-03.4.7, Automation of Dose Projection Procedures, describe computer programs which automate dose projection calculations when used in conjunction with the BNP meteorological systems.

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 annunciator panels. A fire signal initiated by a detector flows through a control panel unit to an annunciator panel. The control panel unit is located in the same building as the detector. The annunciator panel is located in the 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. SD-41 provides a description of detector types, numbers, and locations.

5.9 PROTECTIVE FACILITIES AND EQUIPMENT

OPEP-04.6, Radiological Emergency Kit Inventories, lists emergency equipment that is available for the various Brunswick emergency facilities.

Complete personnel decontamination facilities are included in the Service Building. These facilities include two decontamination showers. Alternate means for decontamination are also available.

5.10 FIRST AID AND MEDICAL FACILITIES

First Aid is located on the first floor of the O&M Building. First aid kits and supplies are also placed at various locations throughout the plant.

Off-site medical facilities which have agreed to accept personnel are described in Appendix E, Medical Treatment and Assistance.

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 insure 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 stockroom and the maintenance shops.

5.12 OFF-SITE ENVIRONMENTAL MONITORING EQUIPMENT AND SUPPLIES

In the event of an emergency, the plant has the capability to deploy two off-site environmental monitoring teams as described in OPEP-02.6.6, Environmental Monitoring Team Leader. Two environmental monitoring kits with the necessary equipment and supplies for off-site radiological monitoring are designated for use in the event of an emergency. Transportation for off-site environmental monitoring teams will be supplied by plant vehicles and other Company trucks as available or private autos at the site.

TABLE 5.0-2

FUNCTIONAL OBJECTIVES OF EMERGENCY FACILITIES

<u>Facility Name</u>	<u>Location</u>	<u>Functional Objectives</u>
Technical Support Center (TSC)	Brunswick TSC/EOF/Training Building	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)	Brunswick Operations and Maintenance Building	1) Reporting place for emergency support personnel. 2) Dispatching location of personnel to support actions as directed by the Site Emergency Coordinator.
Joint Information Center	Located in Brunswick Community College Complex, Bolivia, NC	1) Provide immediate access to accurate emergency related information generated by all involved agencies by media representatives. 2) Provide equipment for document reproduction, telecopying, communications, and television electrical connections.
Emergency Operations Facility (EOF)	Brunswick TSC/EOF/Training Building	1) Provide working space and communication links for the Emergency Response Manager and his staff. 2) Provide primary interface point for Progress Energy and off-site support personnel (Federal and State). 3) Provide point of coordination for off-site radiological and environmental assessment.
New Hanover County Emergency Operations Center (EOC)	Wilmington, North Carolina	1) Direction and coordination of New Hanover County emergency and protective response actions.
Brunswick County Emergency Operations Center (EOC)	Bolivia, North Carolina	1) Direction and coordination of Brunswick County emergency and protective response actions.
North Carolina State Emergency Operations Center (EOC)	Raleigh, North Carolina	1) Direction and coordination of Brunswick and New Hanover County emergency and protective response actions.

TABLE 5.7-1

ON-SITE METEOROLOGICAL INSTRUMENTATION

<u>Approximate Height Above Tower Base (ft)</u>	<u>Recorded Parameter</u>	<u>Instrument</u>
344	Windspeed, direction and direction variance	Threshold less than 1 mph.
35	Windspeed, direction, and direction variance	Threshold less than 1 mph.
344	Temperature difference relative to 35 ft elevation	Resistance thermobulb in aspirated radiation shield at 344 and 35 ft elevation.
35	Ambient temperature	Resistance thermobulb in aspirated radiation shield at 35 ft elevation.

TABLE 5.7-2
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
1-1	0.01 - 100	Control Room Operating Area	Control
1-2	0.01 - 100	U-2 Electronic Equipment Room *	Control
1-3	0.01 - 100	U-1 Electronic Equipment Room *	Control
1-4	0.01 - 100	Stack Filter House	Stack
1-5	0.01 - 100	Service Bldg. Radiochemical Lab.	Service
1-6	0.01 - 100	Service Bldg. Personnel Decon Equipment Room	Service
1-7	0.1 - 10 ³	Hot Machine Shop	Service
1-8	0.01 - 100	Service Bldg. Equipment Room East/West Corridor	Service
1-9	0.01 - 100	U-1 Turb. Hall Control Access Corridor	Turbine
1-10	0.01 - 100	U-1 FW Heater Bay Access Corridor	Turbine
1-11	0.01 - 100	U-1 Turb. Bldg. Sampling Station	Turbine
1-14	0.1 - 10 ³	U-1 Turb. Rotor Washdown Area	Turbine
1-15	0.1 - 10 ³	1A Core Spray Pump Room ESS I	Reactor
1-16	0.1 - 10 ³	1B Core Spray Pump Room ESS II	Reactor

- Detectors are located in mechanical equipment room (Control Building ventilation air intake plenum)

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
1-17	0.1 - 10 ³	1A RHR System Hx and Pump Room ESS I	Reactor
1-18	0.1 - 10 ³	1B RHR System HX and Pump Room ESS II	Reactor
1-19	0.01 - 100	U-1 Rx Bldg. Airlock Area EL 20 ft.	Reactor
1-20	0.01 - 100	U-1 Drywell Entrance	Reactor
1-21	1.0 - 10 ⁴	U-1 TIP Room	Reactor
1-22	0.01 - 100	U-1 Decontam. Room EL 20 ft.	Reactor
1-23	0.01 - 100	U-1 Equipment Entry EL 20 ft.	Reactor
1-24	0.01 - 100	U-1 Rx Bldg. Sampling Station	Reactor
1-25	0.01 - 100	U-1 Rx Bldg. Air Lock EL 50', 8"	Reactor
1-26	0.01 - 100	U-1 New Fuel Vault EL 98', 9"	Reactor
1-27	0.01 - 100	U-1 North of Fuel Storage Pool	Reactor
1-28	10 ² - 10 ⁶	U-1 Between Rx and Fuel Pool EL 117 ft., 4 in.	Reactor
1-29	0.01 - 100	U-1 Cask Wash Area Refuel Floor	Reactor
1-30	0.01 - 100	U-1 Spent Fuel Pool Cooling System	Reactor

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
2-1	0.1 - 10 ³	Radwaste Bldg. EL 3 ft. N MCC and Sump Area	Radwaste
2-2	0.1 - 10 ³	Radwaste Bldg. EL 3 ft. S MCC and Sump Area	Radwaste
2-3	0.1 - 10 ³	U-2 Cond Filter - Demin Aisle	Radwaste
2-4	0.1 - 10 ³	U-1 Cond Filter - Demin Aisle	Radwaste
2-5	0.01 - 100	Radwaste Control Room	Radwaste
2-6	0.01 - 100	Radwaste Sampling Station	Radwaste
2-7	0.01 - 100	Radwaste Drum Capping Station	Radwaste
2-8	1.0 - 10 ⁴	Radwaste Drum Storage	Radwaste
2-9	0.01 - 100	U-2 Turb. Hall Access Corridor	Turbine
2-10	0.01 - 100	U-2 FW Heater Bay Access Corridor	Turbine
2-11	0.01 - 100	U-2 Turb. Bldg. Sampling Station	Turbine
2-14	0.1 - 10 ³	U-2 Turb. Rotor Washdown Area	Turbine
2-15	0.1 - 10 ³	2A Core Spray Pump Room ESS I	Reactor
2-16	0.1 - 10 ³	2B Core Spray Pump Room ESS II	Reactor

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
2-17	0.1 - 10 ³	2A RHR System Hx and Pump Room ESS I	Reactor
2-18	0.1 - 10 ³	2B RHR System Hx and Pump Room ESS II	Reactor
2-19	0.01 - 100	U-2 Rx Bldg. Airlock Area EL 20 ft.	Reactor
2-20	0.01 - 100	U-2 Drywell Entrance	Reactor
2-21	1.0 - 10 ⁴	U-2 TIP Room	Reactor
2-22	0.01 - 100	U-2 Decontam. Room EL 20 ft.	Reactor
2-23	0.01 - 100	U-2 Equipment Entry EL 20 ft.	Reactor
2-24	0.01 - 100	U-2 Rx Bldg. Sampling Station	Reactor
2-25	0.01 - 100	U-2 Rx Bldg. Airlock EL 50 ft.	Reactor
2-26	0.01 - 100	U-2 Inside New Fuel Vault EL 98 ft. 8 in.	Reactor
2-27	0.01 - 100	U-2 North of Fuel Storage Pool	Reactor
2-28	10 ² - 10 ⁶	U-2 Between Rx and Fuel Pool EL 117 ft. 4 in.	Reactor
2-29	0.01 - 100	U-2 Cask Wash Area Refuel Floor	Reactor
2-30	0.01 - 100	U-2 Spent Fuel Pool Cooling System	Reactor

TABLE 5.7-3

PROCESS RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Supplier</u>	<u>Range</u>
Main Steam Line Radiation Monitors Channel A (D12-RM-K603A) Channel B (D12-RM-K603B) Channel C (D12-RM-K603C) Channel D (D12-RM-K603D)	GE	1-10 ⁶ mRem/hr
Condenser Off-Gas Radiation Monitors Log Channel A (D12-RM-K601A) Log Channel B (D12-RM-K601B) Linear Channel (D12-RM-K602)	GE	1-10 ⁶ mRem/hr
Main Stack Radiation Monitors	General Atomics	10 ⁻⁷ -10 ⁵ μ Ci/cc (Xe equivalent)
Liquid Process Radiation Monitors Radwaste Effluent (D12-RM-K604) Service Water Discharge (D12-RM-K605) Reactor Bldg Closed Cooling Water (D12-RM-K606)	GE	10 ⁻¹ -10 ⁶ cps
Storm Drain Collector Basin (2-DST-RM-5361)	General Atomics	10 ¹ -10 ⁷ cpm
Reactor Bldg Ventilation Radiation Monitors Channel A (D12-RM-K609A) Channel B (D12-RM-K609B)	GE GE	0.01-100 mRem/hr
Gaseous Analyzer Radiation Monitors Reactor Building Roof Vent (CAC-AQH-1264)	NMC	10-10 ⁶ cpm
Turbine Building Vent (D12-RM-23)	General Atomics	10 ⁻⁷ -10 ⁵ μ Ci/cc (Xe equivalent)
Drywell Primary Containment Atmosphere (CAC-AQH-1260, 1262)	NMC	

TABLE 5.7-3 (Cont'd)

AOG Charcoal Adsorber System Effluent (AOG-R1-103)	General Atomics	10^1 - 10^7 cpm
Hardened Wetwell Vent	General Atomics (Sorrento)	10^{-4} - 10^5 μ Ci/cc

TABLE 5.7-4

TYPICAL PORTABLE SURVEY EQUIPMENT

<u>Type</u>	<u>Range</u>	<u>Type Of Radiation Measured</u>
Teletector	0.1 mRem/hr-1000 Rem/hr	γ
Eberline RM-14 Radiation Monitor	0 - 50,000 cpm	β, γ
Ludlum Model 177	0 - 500,000 cpm	β, γ
R07	1 mr/hr - 20,000 R/hr	β, γ
AMP-100	1 mr/hr - 1000R/hr	γ
AMP-200	100 mr/hr - 18K R/hr	γ
R02	0 - 5000 mr/hr	β, γ
R02A	0 mr/hr - 50 R/hr	β, γ
R020	0 mr/hr - 50 R/hr	β, γ
BICRON Micro Rem	0 - 200,000 μ r/hr	γ
ASP-1 With Neutron Ball	0 - 100 Rem/hr	n
Ludlum Model 12 With Neutron Ball	0 - 10 Rem/hr	n
E530N	0 mrem/hr - 20 R/hr	γ

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

6.0 MAINTAINING EMERGENCY PREPAREDNESS

Emergency preparedness at Brunswick will be maintained by (a) preparing the emergency organization members and the public for proper emergency response actions through training, drills and exercises, and public education programs (Section 6.1); (b) periodic review and update of the Brunswick Radiological Emergency Plan and its implementation procedures (Section 6.2); (c) periodic inventory and calibration of emergency equipment and instrumentation (Section 6.3); and (d) cognizance of the Plant Nuclear Safety Committee over safety-related issues (Section 6.4).

The Supervisor - Emergency Preparedness is the Emergency Planning Coordinator and is responsible for maintaining Emergency Preparedness at the Brunswick Nuclear Plant, as outlined in Section 6.1.3.

Each periodic requirement in this section and elsewhere in the plan and plant emergency procedures shall be performed within the specified time below:

- a. Annually - At least once per 366 days
- b. Monthly - At least once per 31 days
- c. Quarterly - At least once per 92 days
- d. Semiannually - At least once per 184 days

For the above intervals, a maximum allowable extension is permitted subject to the following restrictions:

- The maximum allowable extension shall not exceed 25% of the specified interval.
- The combined time interval for any three consecutive intervals shall not exceed 3.25 times the specified interval.

This definition for periodic requirements applies to all intervals in the emergency plan and plant emergency procedures except for the evaluated exercise which is conducted once every two calendar years, and off-site training which is conducted once per calendar year.

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 retraining of the emergency response organization. Significant changes in the content of this Plan and procedures which implement this Plan are distributed by memorandum to the appropriate plant groups.

6.1.1 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 assigned individuals and their alternates in their duties and responsibilities.
3. When appropriate, train on significant changes in the scope or contents of the Plan or procedures which implement the Plan.
4. Provide annual refresher training and retesting to ensure that Emergency Plan personnel are familiar with their duties and responsibilities assigned by the Plan and procedures which implement the Plan.

Each individual, other than escorted personnel, is provided with initial orientation training on the notification and instruction methods used at the Brunswick plant in the event of an emergency.

Each badged individual, other than escorted personnel, also receives initial orientation on the basic principles of radiological safety including the effects of radiation and the theory and use of radiation detection devices. Appropriate actions for escorted individuals shall be the responsibility of the escort.

The Emergency Plan Training Program described in OPEP-04.3 assures training of those individuals who may be called to respond to an emergency at the Brunswick plant by providing initial training and annual refresher training and retesting on the scope and content of the Plan and procedures which implement the Plan.

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 Staff Personnel
Security Personnel
Fire Brigade Personnel
Dose Projection Personnel
Radiological Emergency Teams
Emergency Communicators
EOF Personnel
OSC Personnel
JIC Personnel
Plant Operators
Off-site groups who may be requested to assist in an emergency.

Training of off-site organizations is described in their radiological emergency plans. Training by Progress Energy for hospital, ambulance, rescue, police, and fire personnel will include the procedures for notification, basic radiation protection, and their expected roles. For those local services support organizations who may enter the site, training by Progress Energy will also include site access procedures and the identity (by position and title) of the individual in the Brunswick organization who will control the organization's support activities. Progress Energy will assist these off-site organizations in performing their radiological emergency response training as related to the Brunswick plant.

Progress Energy, and the public information officials from the state and local governments will jointly make available an annual program to acquaint the news media with the company, state and county emergency plans and procedures. The program also includes information concerning radiation, nuclear plant operations and official points of contact for release of public information.

Severe Accident Management training and drills will be conducted in accordance with Severe Accident Management Program and Training Procedures.

6.1.2 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, off-site 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 observers.

6.1.2.1 Drills

Emergency drills are supervised instruction periods aimed at testing, developing and maintaining skills, and to ensure that adequate emergency response capabilities are maintained during the interval between evaluated exercises. Periodic drills will be conducted, in addition to the evaluated exercise as follows:

1. General: At least one drill shall be conducted during the interval between evaluated exercises involving a combination of some of the principal functional areas of the organization's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as

management and coordination of emergency response, accident assessment, protective action decision making, and plant system repair and corrective actions.

During these drills, activation of all of the emergency response facilities (Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)) is not necessary.

Participants have the opportunity to consider accident management strategies, supervised instruction is permitted, and participants have the opportunity to resolve problems (success paths) rather than have controllers intervene. The drills focus on onsite training objectives.

2. Communications Drills: A system to test the readiness of the communications network between the plant and state and county governments within the ten-mile EPZ and the NRC will be conducted monthly. Communications between the plant, federal emergency response organizations, and states within the 50-mile EPZ will be tested quarterly. Communications between the plant and state and local emergency operation centers and field assessment teams shall be conducted annually.
3. Fire Drills: Fire drills will be conducted in accordance with the Fire Protection Program.
4. Medical Emergency Drills: Medical emergency drills involving a simulated contaminated individual will be conducted annually. The actual off-site portions of these drills may be conducted once per calendar year.
5. Radiological Monitoring Drills: Radiological monitoring drills will be conducted annually. These drills will include collection of the appropriate sample media both on site and off site as the drill scenario requires.

6. 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. This may be held in conjunction with the Radiological Monitoring Drills.
7. Augmentation drills: Augmentation drills requiring travel to the site shall be conducted once every 24 months.
8. SAMG drills: Severe Accident Management Guideline table-top and/or inter-facility mini-drills will be conducted periodically and will involve a combination of some of the principal functional areas of the organization's onsite emergency response capabilities similar to that described in General drills (6.1.2.1.1) above.

The above drills will be evaluated by a drill observer (communication drills will not require an observer). The degree of participation by outside agencies in conducting these drills may vary and their action may actually be simulated. Any state or local government located within the plume exposure pathway EPZ will be allowed to participate in the drills when requested by such State or local government.

6.1.2.2 Exercises

An exercise is an event that tests the integrated capability of major response organizations. An emergency exercise will be conducted once every two calendar years and will be based on a scenario which is ultimately declared at least as a Site Area Emergency. The scenario will be varied from exercise to exercise such that all elements of the plant, county, and state plans and emergency organizations are tested within a 6-year period. Each organization should make provisions to start an exercise between 6:00 p.m. and 4:00 a.m. Every sixth year, the exercise will be expanded to allow involvement of 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.

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

1. Condition recognition and reporting
2. Assessment
3. Off-site notification, including Progress Energy off-site personnel
4. Off-site response
5. Site response coordination, including logistics, center manning, information gathering and analysis, and coordination with off-site agencies
6. Corrective actions
7. Protective actions
8. Record keeping
9. Monitoring
10. Plant operation

Qualified observers 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 Emergency Planning Coordinator, or his designee, following the critique.

Exercise controllers, observers, 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 Planning Coordinator or his designee will determine the corrective actions necessary and the schedules for performing them and will evaluate the corrective actions taken.

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.

6.1.3 Emergency Planning Coordinator

The Supervisor - Emergency Preparedness is the Brunswick Emergency Planning Coordinator. He is responsible for coordinating on-site and off-site radiological emergency response planning. Specific responsibilities include the following:

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 the evaluated exercise and the periodic drills.
4. Identifying off-site training needs of state and local emergency support personnel and arranging for training to meet the identified needs.
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. These corrective actions can be tracked by means of the Corrective Action Program.
6. Maintaining and negotiating agreements with state and county response agencies, federal assistance agencies, and medical and fire support agencies.

6.1.4 Public Education

The North Carolina Department of Crime Control and Public Safety has overall responsibility for maintaining a continuing disaster preparedness public education program. Such a program, prepared by the State of North Carolina, with the cooperation of local governments and Progress Energy, is intended to ensure that members of the public are:

- (1) Aware of the potential threat of a radiological emergency;
- (2) Able to recognize radiological emergency notification; and
- (3) Knowledgeable of the proper, immediate actions (e.g., return to home, close windows, and tune to an Emergency Alert System station) 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 concerning public education can be found in Section 4.4.7.

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.

6.2.1 Plan Updates

The Emergency Planning Coordinator is responsible for coordinating the updating of the Plan and implementing procedures. He schedules an annual review of the Plan by the Plant Nuclear Safety Committee (see Section 6.4). Any proposed changes to the Plan due to regulatory revisions, experiences of drills and exercises, or other requirements are approved by the Supervisor - Emergency Preparedness. Approved changes to the Plan will be distributed to organizations and individuals with responsibility for implementation of the Plan. Phone listings in emergency procedures shall be updated quarterly, if required.

6.2.2 Independent Review

In addition to the reviews conducted at the plant, the Nuclear Assessment Section will conduct an independent review of the Plan either:

At intervals not to exceed 12 months or,

As necessary, based on an assessment by the licensee against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness, but no longer than 12 months after the change. In any case, all elements of the emergency preparedness program must be reviewed at least once every 24 months.

The review will include an evaluation for adequacy of interfaces with State and local governments and of drills, exercises, capabilities, and procedures. The results of the review, along with recommendations for improvements, will be documented, reported to the Corporate office and plant management, and retained for a period of five years. The part of the review involving the evaluation for adequacy of interface with the State and local governments will be available to the appropriate State and local governments. Corrective actions deemed necessary from the review will be implemented similar to the description in Section 6.1.3.5 of this Plan and the site Corrective Action Program.

6.2.3 Off-Site Agreements and Plans

Emergency response plans and agreements with supporting organizations will be reviewed and certified to be current on an annual basis and updated, if necessary. Changes will be incorporated in the annual revision of the Plan.

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.

6.3.1 Emergency Equipment and Supplies

A listing of emergency equipment and supplies to be inventoried is included in OPEP-04.6. This listing provides information on location and availability of emergency equipment and supplies.

An inventory of emergency equipment and supplies is held in accordance with OPEP-04.6. During this inventory, radiation monitoring equipment is checked to verify that required calibration and location are in accordance with the inventory lists. Respiratory protection equipment, maintained for emergency purposes, is also inspected and inventoried.

6.3.2 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 Office 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.

6.4 PLANT NUCLEAR SAFETY COMMITTEE

The Plant Nuclear Safety Committee (PNSC) is a standing committee comprised of Brunswick plant 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 reviews all changes to the plant, or its documentation, that involve unreviewed safety questions. In addition, the PNSC reviews plant operations to detect any potential safety hazards. Each plant supervisor will monitor the activities within his areas of responsibility to detect unsafe practices, trends, or hazards. Also, the PNSC investigates and reports on Technical Specification violations or other situations involving safety.

BRUNSWICK NUCLEAR PLANT
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7.0 RECOVERY

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 that recovery activities are initiated and that the Recovery Organization as shown in Figure 7.2.1 will be assembled in the EOF. All recovery actions will be preplanned in order to minimize radiation exposure or other hazards to recovery personnel. Recovery activities are classified as described in Section 7.3.

The overall goals of the recovery effort are to assess the radiological consequences of the emergency and perform cleanup and repair operations necessary to restore normal access to the affected areas or identify and restrict access to those areas that must be controlled. This effort includes marshaling of the Corporate resources and interfacing with outside agencies.

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.

The Recovery Center at Brunswick will be established in the existing TSC/EOF/Training Building. Provisions have been made for expansion into the BNP Technical and Administration Center (TAC Building), if required to support an extensive recovery effort.

Activation of the recovery organization will be initiated by the Vice President - Brunswick Nuclear Plant (or his alternate) after consultation with the Plant General Manager (or his alternate). The recovery organization will then be established at Brunswick 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. A block diagram of the typical recovery organization is presented in Figure 7.2-1.

7.2.1 Recovery Manager

The Recovery Manager is the senior position responsible for all on-site activities during the recovery phase following a radiological emergency. He is also responsible for providing the primary interface with State, local and Federal agencies including the coordination of Progress Energy resources during off-site recovery efforts. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.2 Plant General Manager

The Plant General Manager is responsible to the Recovery Manager for implementation of in-plant activities during the Recovery phase with the objective of maintaining a safe shutdown condition and controlling sources of radioactivity in the plant. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.3 Technical Analysis Manager

The Technical Analysis Manager, is responsible to the Recovery Manager for technical support, specifically in the analysis and development of plans and procedures to support recovery activities 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 specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.4 Engineering Manager

The Engineering Manager, is responsible to the Recovery Manager for directing and administratively controlling the Progress Energy recovery organization engineering staff while providing engineering, including civil, and design support to meet requirements of the recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.5 Administrative and Logistics Manager

The Administrative and Logistics Manager, is responsible to the Recovery Manager for providing administrative, logistic, communications, and personnel support for recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.6 Radiological Control Manager

The Radiological Control Manager, is responsible to the Recovery Manager for providing radiation protection and waste disposal plans to support recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.3 RECOVERY PLANNING

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

1. On-site recovery
2. Off-site recovery

7.4 ON-SITE RECOVERY ACTIVITIES

On-site recovery activities are performed in accordance with existing plant procedures. Radiation and contamination levels for determining the need for decontamination and for returning areas or items to normal use are included in these procedures. Additional procedures will be developed as appropriate on a case-by-case basis.

7.5 OFF-SITE RECOVERY ACTIVITIES

7.5.1 General

The Progress Energy Recovery Manager will coordinate with and assist off-site agencies in the recovery activities.

The State will be the lead organization for off-site recovery activities 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 reentry to off-site areas will be made by the senior elected official of the area concerned after consultation with the North Carolina Division of Radiation Protection.

7.5.2 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:

- a. Allow health physics teams to survey the contaminated areas,
- b. 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.
- c. Allow emergency operations of utilities and services (power, water, telephone, sewage treatment, etc.) during the cleanup operation, and
- d. 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).

- e. Stabilize the contaminated areas so that the radioactive materials are not spread to other areas or leached 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, and 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.

7.5.3 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:

- a. 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.

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

- b. 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.
- c. Diverting affected products to uses other than human consumption.
- d. Condemning food.
- e. Decontaminating farmland where practical.
- f. Converting farmland to other uses for extended periods of time when decontamination is not practical.
- g. 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.

7.5.4 Monitoring and Dose Assessment

The North Carolina Division of Radiation Protection (DRP), Department of Environment Health and Natural Resources, will be the lead agency in the collection and analysis of radiation monitoring reports and of environmental air, foliage, food, and water samples. The DRP will be assisted by qualified personnel from the BNP, and the General Electric Company Wilmington Manufacturing Division.

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

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

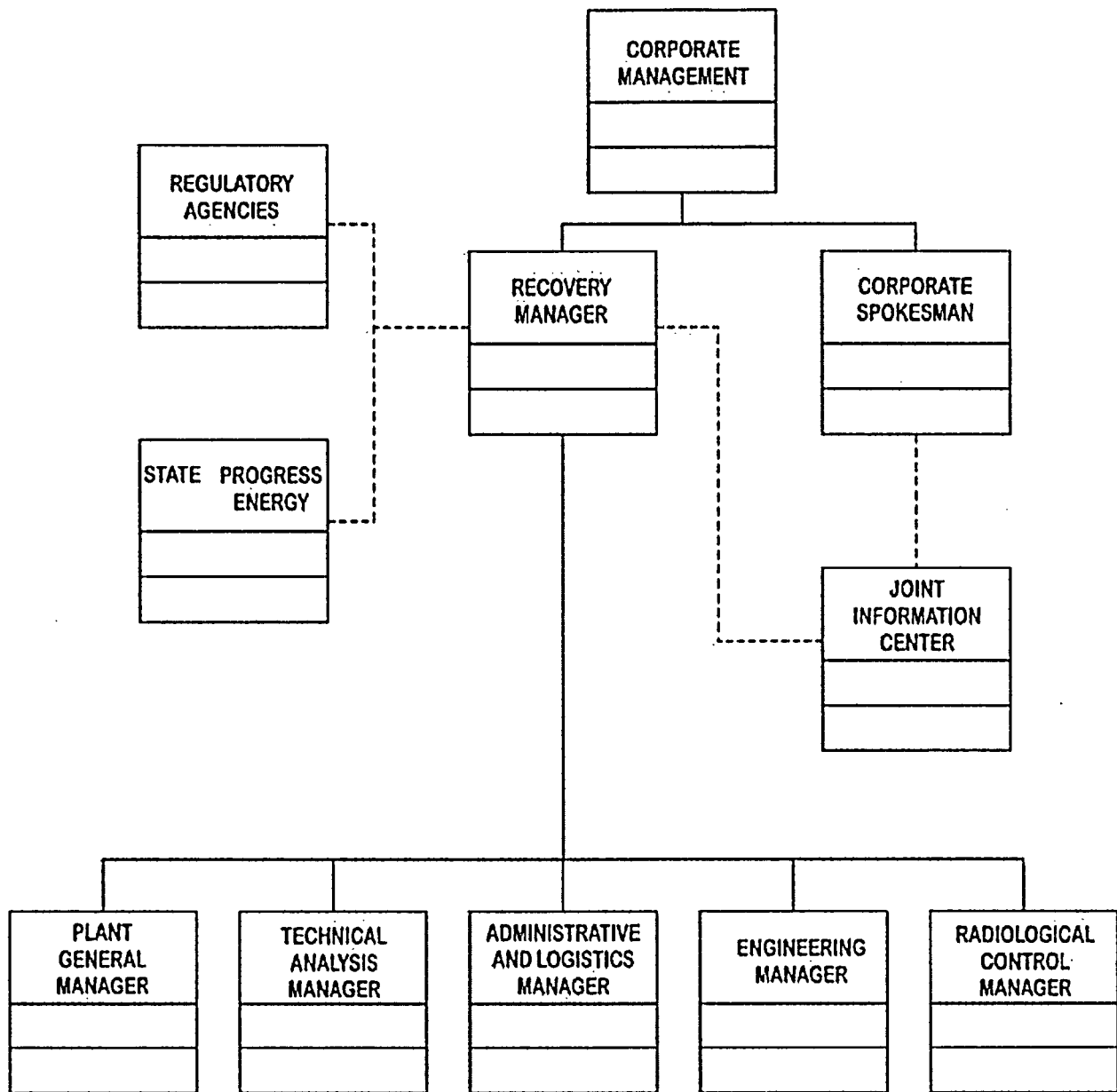


FIGURE 7.2.1 Progress Energy Recovery Organization

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

8.0 REFERENCES

1. Brunswick Steam Electric Plant Operating Manual, Carolina Power & Light Company, (date varies by volume and by entry).
2. NGGM-PM-0002, Progress Energy Radiation Control and Protection Manual.
3. Updated Final Safety Analysis Report (FSAR), Progress Energy, Brunswick Steam Electric Plant Units 1 and 2.
4. Environmental and Fallout Gamma Radiation Protection Factors Provided By Vehicles, Health Physics, 26, Pg. 41-44, 1974.
5. EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, U. S. Environmental Protection Agency, May 1992.
6. Brunswick Nuclear Power Plant Evacuation Time Estimates Update For The Plume Exposure Pathway Emergency Planning Zone, November 2002. PBS&J.
7. North Carolina Emergency Response Plan in support of the Brunswick Steam Electric Plant.
8. NUREG-0654/FEMA-REP-I, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.
9. 1990 Census data as reported by the State of North Carolina, Office of State Planning, Center for Geographic Information and Analysis.
10. NUREG-0737, Supplement 1, Clarification of TMI Action Plan Requirements.
11. NUREG/CR-1433, Examination of the Use of Potassium Iodide (KI) as an Emergency Protective Measure for Nuclear Reactor Accidents, March 1990.

12. Title 10, Code of Federal Regulations.
 - a. Part 20, Standards for Protection Against Radiation
 - b. Part 50, Licensing of Production and Utilization Facilities
 - c. Part 50, Appendix E, Emergency Plans for Production and Utilization Facilities
 - d. Part 100, Reactor Site Criteria
13. NEI 91-04, Rev. 1, Severe Accident Issue Closure Guidelines
14. Memo, Warren Dorman to PNSC, dated August 11, 1999 Subject Operations Shift Staffing
15. Brunswick Steam Electric Plant, Units 1 and 2 - Issuance of Amendments No. 226 and 253, Elimination of Requirements for Post Accident Sampling System (Docket Nos. 50-325 and 50-324), February 11, 2003.
16. SOER 02-1, Severe Weather Rec. 3 (12/03/02)

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APPENDIX A

BRUNSWICK COMMUNICATIONS SYSTEM

A.0 INTRODUCTION

Communications systems are designed to facilitate emergency communications within the Brunswick Plant and between Brunswick and emergency facilities. Redundant means of communication are provided to locations which provide a vital emergency response role.

A.1 PLANT COMMUNICATION SYSTEMS

A.1.1 Public Address System

The Brunswick Plant 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.

A.1.2 PBX Telephone System

The Brunswick Site 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 and A.2.2.

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 Brunswick and Vicinity

VHF transceivers are used for point-to-point communications in the plant vicinity using state frequencies. Control stations are located in the TSC and EOF to talk with mobile and portable units. A primary and secondary source of power is provided for fixed base radio, with portable and mobile units powered by battery.

A.1.5 Brunswick Emergency Telephone and Radio System

The Brunswick Site emergency telephone system consists of dedicated telephone lines between emergency facilities at the Brunswick Plant through a switch which is provided with a primary and secondary source of power (ROLM 4000 series). Radio communications with mobile and portable units reserved for an emergency is possible through a repeater on a Progress Energy-assigned frequency as well as a local (UHF) short-distance frequency. A primary and secondary source of power is provided for fixed radio equipment, with mobiles and portables powered by battery.

A.1.6 Plant Security Communications

A portable radio communication system for plant use is available. Specific channel assignments are designated for security force use.

A.1.7 Emergency Response Facility Information System (ERFIS)

During an emergency, this system provides information on a Video Display Terminal simultaneously in the control room, the Technical Support Center, and the Emergency Operations Facility. The data may also be printed out in hard-copy form. Primary and secondary power sources are supplied to this system.

A.1.8 Satellite Telephone Communications

This system consists of a briefcase enclosed portable, AC, DC, or battery powered satellite link telephone. This telephone has the capability to be connected with a fixed remote antenna or use the briefcase portable antenna with access to either of two geosynchronous communication satellites.

A.2 OFF-SITE COMMUNICATIONS SYSTEMS

A.2.1 Corporate Telephone Communications System (Voicenet)

Interconnected through the site PBX and the emergency telephone system, the corporate telephone system provides a means to communicate with other corporate locations with which the plant has a need to communicate. Corporate transmission facilities provide fiber optic, copper-wire, and microwave radio to ensure a high degree of system reliability. In addition to the redundancy provided by the three system options, backup power is provided for the systems.

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A.2.2 Commercial Phone Lines

Commercial telephone lines, which supply public telephone communications, are employed by Progress Energy in three ways: (1) tie-ins through the PBX to any other plant location, (2) lines to plant emergency facilities, and (3) lines to the Joint Information Center for public information purposes. Bell South provides primary and secondary power for their lines at the Central Office.

A.2.3 Dedicated Telephone System to Load Dispatcher

This system provides direct links between the Control Room and the load dispatcher. Transmission facilities are microwave radio. 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 Brunswick as the caller. Primary and secondary power is supplied at both ends.

A.2.4 Emergency Communications Network

The Emergency Communications Network is a system, separate from other communications systems, which provides back-up dedicated telephone and radio facilities between emergency response centers. The purpose of these facilities is to ensure priority communications at any time from Brunswick Plant to emergency response personnel at the federal, state, local governments, and other Progress Energy facilities, and General Electric Company.

A.2.5 Plant Security

A plant security radio control station provides for radio communications to local law enforcement agencies (LLEA). Primary and secondary power is supplied.

A.2.6 Corporate Informational Data Communications

Large central computers are located at the Corporate headquarters. Smaller special purpose computers are located at other Corporate facilities, including the Brunswick Plant. The communications link between the Brunswick Plant and Corporate headquarters allows the interchange, storage, and processing of information.

A.2.7 NRC Emergency Telecommunications System

The NRC uses a Progress Energy dedicated telephone line which allows direct telephone communications from the plant to NRC regional and national offices. The Progress Energy communications line provides a link independent of the local public telephone network. Telephones connected to this network are located in the Brunswick Control Room, Technical Support Center, and Emergency Operations Facility. There are also telephones connected to this system for use by Health Physics personnel. Primary and secondary sources of power are supplied.

Appendix B
AGREEMENTS

NOTE: Existing agreements are included for this submittal. These agreements will be revised as required to be consistent with this revision of the Plan.

City of Southport
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February 4, 2003

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PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the City of Southport and Southport Fire Department's (hereafter identified as Fire Department) understanding and agreement to provide assistance in the event of an accident or emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. This agreement shall take effect on July 1, 1987. Either party may terminate this agreement at any time upon six months written notice to the other party.
2. The Fire Department shall be available to fight fires at the Brunswick Plant upon request by Progress Energy, including fires where radioactivity may be present. However, in any situation where radioactivity may be present, the BNP Shift Incident Commander shall first consult with the Chief Officer of the Southport Fire Department concerning the situation before sending any of the Fire Department into an area where radioactivity may be present. After consultation the Chief Officer of the Fire Department will comply with the Brunswick Shift Incident Commander's request and shall issue the command to his personnel with respect to his department's safety.
3. In the event that the Fire Department is unavailable to respond to Progress Energy's request due to other calls or fire fighting activities, it will incur no liability to Progress Energy for failure to respond to said call.
4. The Fire Department will be under the direction of the BNP Shift Incident Commander who shall issue commands to the personnel of the Fire Department through its Chief Officer. Should it be necessary for more than one fire company to assist in the fighting of a fire at BNP, the Fire Department will assume responsibility as the lead fire company.
5. In the event of possible radioactive contamination of the Fire Department personnel and/or equipment, qualified Progress Energy personnel will provide Fire Department personnel with appropriate monitoring or protective devices prior to engaging said personnel in a radioactive situation to ensure that the radiation level is not unreasonably dangerous.
6. In the event of a chemical fire at BNP, proper clothing will be provided by Progress Energy to Fire Department personnel prior to engagement in fire fighting.

7. Progress Energy shall provide the Fire Department personnel with all necessary instructions and training to enable the Fire Department personnel to engage in fire fighting at BNP. Fire Department personnel agree to participate in said training and in all training exercises and drills. In addition, Progress Energy shall not request Fire Department personnel to engage in fighting of a chemical fire or in a fire where radioactivity may be present prior to any additional instruction or training of Fire Department personnel necessary to qualify them to engage in such activities. Both Progress Energy and the Fire Department personnel shall cooperate with each other in arranging for the instruction and training of the Fire Department personnel necessary to qualify them to engage in such activities. Both Progress Energy and the Fire Department personnel shall cooperate with each other in arranging for instruction and training exercises.
8. Any contaminated articles belonging to the Fire Department or its personnel, including fire trucks, will be adequately decontaminated or replaced by Progress Energy at its own expense as expeditiously as possible.
9. Progress Energy shall be liable to the Fire Department personnel for any radiation injury sustained by said personnel at BNP and shall provide nuclear insurance to cover the Fire Department personnel while engaged in fire fighting at BNP.
10. Progress Energy shall retain the right to periodically inspect, calibrate, and ensure operability of any equipment that may be furnished the Fire Department in order to enhance the performance of the support functions.
11. The Fire Department shall furnish and make available to the Fire Department personnel a procedure manual for assisting the BNP Fire Brigade.
12. As compensation for services provided herein by the Fire Department, Progress Energy shall pay to the City of Southport the sum of \$12,000 per year payable on or before December 31, 1987, and each year thereafter.

Sincerely,

(Signature on File)
Norman Holden
City of Southport
Mayor

(Signature on File)
Gregg Cumbee
City of Southport
Fire Chief

TG/TG

SPFD LOA

James R. Forstner, M.D.
4654 Long Beach Road
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges that I, James R. Forstner, M.D., understand and agree to provide medical supervision and care for employees of the Brunswick Nuclear Plant as requested by responsible plant management personnel.

I am familiar with the Brunswick Emergency Plan and appropriate implementing procedures and understand that injuries might involve ionizing radiation.

I will provide said medical supervision and treatment within the limitations of my training.

Sincerely,

(Signature on File)
James R. Forstner, M.D.

TG/TG

JR Forstner MD LOA

Peter D Almirall, M.D.
307 Yaupon Drive
Yaupon Beach, North Carolina 28465

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges that I, Peter D. Almirall, M.D., understand and agree to provide medical supervision and care for employees of the Brunswick Nuclear Plant as requested by responsible plant management personnel.

I am familiar with the Brunswick Emergency Plan and appropriate implementing procedures and understand that injuries might involve ionizing radiation.

I will provide said medical supervision and treatment within the limitations of my training.

Sincerely,

(Signature on File)
Peter D. Almirall, M.D.

TG / TG

PD Almirall MD LOA

J.Arthur Doshier Memorial Hospital
924 Howe Street
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Project
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the J. Arthur Doshier Memorial Hospital's understanding of, and agreement with, actions to be taken in the event of an accident or emergency at the Brunswick Nuclear Project (BNP). Specifically, we are familiar with the BNP Emergency Plan and understand that:

1. A specially designed radiological emergency area will be maintained in state of readiness for use in the event that an accident or injury complicated by possible radiation exposure occurs to your employees. The Doshier Memorial Hospital will admit a patient from the specially designated area for further care if recommended by the supervising physician.
2. In the event of a serious radiation accident, the Hospital will assist in the transfer of patients to the New Hanover Regional Medical Center in Wilmington for further treatment.
3. A Progress Energy representative will be responsible for decontamination of the equipment that is used in treating/decontaminating the person(s) and will replace all hospital equipment that cannot be decontaminated.
4. Adequate instruction of the Medical staff to maintain familiarity with the procedure will be provided by Progress Energy.
5. Disposable articles, such as hats, mask, gowns, and floor coverings, will be provided by and disposed of by Progress Energy.

Copies of the Hospital's Plan and Procedures for the care and treatment of radiologically injured or contaminated patients are kept readily available for use by Hospital employees who will direct the necessary actions.

Sincerely,

(Signature on File)
Edgar Haywood
Administrator
J. Arthur Doshier Memorial Hospital

TG/TG

JADMH LOA

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City of Southport Rescue Squad
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Southport Rescue Squad understands and agrees to provide medical assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we are familiar with the Brunswick Emergency Plan and understand that:

1. We may be required to transport a patient who is radioactively contaminated.
2. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Southport Rescue Squad personnel with appropriate monitoring or protective devices.
3. Adequate instructions will be provided by Progress Energy to the Southport Rescue Squad staff to maintain familiarity with the necessary procedures.
4. Any contaminated articles belonging to the Southport Rescue Squad, including the ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Copies of the Southport Rescue Squad's procedures for assisting Progress Energy personnel are kept readily available for use by the Southport Rescue Squad personnel.

Sincerely,

(Signature on File)
Douglas A. Ledgett
Chief
Southport Rescue Squad

(Signature on File)
Rob Gandy
City Manager
City of Southport

TG / TG

SRS LOA

Yaupon Beach Volunteer Fire Department
8500 East Oak Island Drive
Oak Island, North Carolina 28465

February 19, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 2846-0429

Dear Mr. Atkinson,

This letter acknowledges the Yaupon Beach Volunteer Fire Department's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Yaupon Beach Volunteer Fire department will be available to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Yaupon Beach Volunteer Fire department personnel with appropriate monitoring or protective devices
4. Adequate instruction of the Yaupon Beach Volunteer Fire Department staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to the Yaupon Beach Volunteer Fire Department, including the fire truck, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

James C. Criscoe
Fire Chief
Yaupon Beach Volunteer Fire Department

TG / TG

YBVFD LOA

Boiling Spring Lakes Fire Department
PO Box# 10718
Southport, North Carolina 28461

February 19, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Boiling Spring Lakes Fire Department's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Members of the Boiling Spring Lakes Volunteer Fire Department may be requested to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Boiling Spring Lakes Fire Department personnel with appropriate monitoring or protective devices.
4. Adequate instruction of the Boiling Spring Lakes Fire Department staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to the Boiling Spring Lakes Fire Department, including fire apparatus, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

Gary W. Bullard
Fire Chief
Boiling Spring Lakes Fire Department

TG / TG

BSLFD LOA

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February 25, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461

Dear Mr. Atkinson:

This letter is to renew the agreement between Brunswick Nuclear Plant (BNP) and the New Hanover Regional Medical Center and New Hanover Regional Emergency Medical Services. We agree that:

1. J. Arthur Doshier Memorial Hospital is the primary hospital to assist BNP in the event of an accident or medical emergency causing injury/illness to your employees. This letter acknowledges that New Hanover Regional Medical Center (NHRMC) and Cape Fear Hospital (CFH) are available to treat your employees who may become injured and/or contaminated with radioactive and/or other hazardous materials and are transported to the hospital(s). It is requested the New Hanover Regional Medical Center, main campus on 17th Street, be utilized as the primary hospital treatment site. A specifically designated radiological decontamination area will be maintained in a state of readiness. NHRMC will hospitalize persons for further care if recommended by the physician in attendance.
2. A Progress Energy trained representative will be responsible for the decontamination of equipment that is used in treating/decontaminating the person(s) and will expeditiously replace all hospital equipment that cannot be decontaminated.

Copies of your emergency response plan are maintained in the Safety Office at New Hanover Regional Medical Center. As previously agreed, please send all updates to these plans to the Safety Office.

If you have questions or need further assistance, please contact Barbara Bissett, the Director of Emergency Response, Safety Management, and Special Police Services at 343-7084.

Sincerely,

(Signature on File)

James S. Green
Interim Executive Vice President/CFO

cc: Ed Woodard, Vice President/Chief Emergency Medical Services
Barbara Bissett, Director of Emergency Response, Safety Mgmt & Special Police Services
Nancy Woolwine, Interim Director of Emergency Services
Fiscal Services - Contract File

New Hanover Regional Medical Center
P.O. Box 9000 / 2131 S. 17th Street / Wilmington, NC 28402-9000
910-343-7000

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Oak Island Fire/EMS
4601 East Oak Island Drive
Oak Island, North Carolina 28465

February 6, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Oak Island Fire/EMS's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Oak Island Fire/EMS will be available to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Oak Island Fire/EMS personnel with appropriate monitoring or protective devices.
4. Adequate instruction of the Oak Island Fire/EMS staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to Oak Island Fire/EMS, including the fire truck, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)
Al Essey
Chief
Oak Island Fire/EMS

TG/TG

OIFEMS LOA

Brunswick County EMS
P. O. Box 249
Boliva, North Carolina 28422

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Brunswick County Emergency Medical Service understands and agrees to provide medical assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we are familiar with the Brunswick Emergency Plan and understand that:

1. We may be required to transport a patient who is radioactively contaminated.
2. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Brunswick County EMS personnel with appropriate monitoring or protective devices.
3. Adequate instructions will be provided by Progress Energy to the Brunswick County EMS staff to maintain familiarity with the necessary procedures.
4. Any contaminated articles belonging to the Brunswick County EMS, including the ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Copies of the Brunswick County EMS procedures for assisting Progress Energy personnel are kept readily available for use by the Brunswick County EMS personnel.

Sincerely,

(Signature on File)
B.A.Watts EMS Division Head
Director
Brunswick County Emergency Services

TG / TG

BCEMS LOA

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Sunny Point Fire Department
Military Ocean Terminal - Sunny Point
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Sunny Point Fire Department/EMS's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Sunny Point Fire Department will be available to fight fires where radioactivity may be present as requested by the Southport Fire Department for assistance.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. We may be required to transport a patient who is radioactively contaminated.
4. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Sunny Point Fire Department/EMS personnel with appropriate monitoring or protective devices.
5. Adequate instruction of the Sunny Point Fire Department/EMS staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
6. Any contaminated articles belonging to the Sunny Point Fire Department/EMS, including the fire truck and ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

Scott Brown
Chief
Sunny Point Fire Department

TG / TG

SPEMS LOA

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Brunswick Community College
50 College Road NE Bolivia
Supply, NC 28462-0030

Brunswick County Office of Emergency Management
PO Box 9
Bolivia, NC 28422

Progress Energy
Brunswick Nuclear Plant
PO Box 10429
Southport, NC 28461-0429

February 23, 2004

LETTER OF AGREEMENT

The Joint Information Center is a central location used by various emergency agencies to coordinate information to the public and the press in the event of an emergency at the Brunswick Nuclear Plant. The Joint Information Center is staffed by Progress Energy, the State of North Carolina, Brunswick and New Hanover County Emergency Management, the Nuclear Regulatory Commission, and the Federal Emergency Management Agency, as well as other agencies.

This letter delineates the understanding and agreement of Brunswick Community College, Brunswick County, and Progress Energy to provide assistance during drills or exercises and in the event of an accident or emergency at the Brunswick Nuclear Plant requiring activation of the Joint Information Center (hereafter identified as the JIC).

For consideration of the mutual promises stated below, Brunswick Community College (hereafter identified as BCC), Brunswick County Emergency Management, and Progress Energy Brunswick Nuclear Plant (hereafter identified as Progress Energy) agree as follows:

1. BCC shall allow the use of the college facilities and furniture for the JIC. During an emergency, BCC shall allow the use of any facilities needed to meet the needs of the JIC. The primary locations needed for the JIC (for drills or exercises) shall be the Administration Building Multipurpose Room, Classrooms 161 and 162, and the Teaching Auditorium, the first floor rest rooms, and the back entrance to the building. The layout for the JIC can be found on the attached drawings. (JIC layout on file and in accordance with OPEP-02.6.29).
2. Agencies using the JIC and not affiliated with BCC shall carry their own insurance coverage at an adequate level or provide evidence of self-insurance that is acceptable to BCC.
3. Progress Energy shall assume liability for negligent damage to college property or personal injury due to negligence in connection with the use of the JIC.
4. No liability shall be assumed by the BCC Board of Trustees or faculty/staff, individually or collectively, for personal or property injury or loss suffered by reason of using college property.
5. BCC shall provide secure storage areas for JIC equipment needed for a rapid setup of the JIC. Progress Energy agrees to pay all reasonable expenses for installation of cabinets for said equipment.

6. Progress Energy shall provide all telephone equipment needed for the JIC as well as all reasonable telephone installation fees and monthly service charges in connection with JIC telephone services. BCC agrees to allow telephone switching equipment needed for the JIC to be placed in the telephone equipment room and shall allow telephone service to be wired into the primary JIC locations listed above.
7. Progress Energy shall provide electronic equipment (computers, fax machines, small copy machines, etc.) needed for the JIC. BCC equipment may be used but is not guaranteed to be available or in working order. BCC shall allow use of tables, chairs, lighting, heating and cooling, etc., as needed for the JIC. BCC shall allow Progress Energy the use of any large copy machines owned or leased by BCC for use by the JIC in drills and emergencies.
8. BCC shall allow Progress Energy to use radio equipment available to the Campus Security. Should Progress Energy deem necessary, BCC shall allow Progress Energy to install additional radio equipment to allow a backup communications link with the Progress Energy Brunswick Plant. Progress Energy agrees to pay all reasonable expenses for installation of radio equipment.
9. Progress Energy should provide Visitor Parking identification to personnel in the JIC to assist BCC with parking control.
10. BCC shall provide keys to be maintained by Brunswick County Emergency Management that will allow access to the college by Progress Energy and other government agencies should an emergency occur at the Brunswick Plant requiring activation of the JIC.
11. BCC agrees to provide campus police coverage during drills and exercises. BCC agrees to allow Brunswick County Sheriff's Department personnel and the North Carolina Highway Patrol to control access to the college during an emergency that requires activation of the JIC.
12. In the event of an emergency requiring the activation of the JIC, BCC shall provide what manpower is available to help set up the JIC in as short a time as possible.
13. BCC agrees to provide cafeteria services for the JIC during normal college hours and to bill Progress Energy for the reasonable cost of services provided. In an emergency, food service shall be provided as best as possible by BCC depending on the nature of the event. In an emergency, if BCC is unable to provide food services, BCC shall allow the cafeteria to be freely used by the JIC and shall not hinder other vendors from providing food services.
14. BCC agrees to provide maintenance and/or janitorial services for the JIC following use.
15. Reasonable costs incurred by BCC in connection with the JIC for labor provided by employees of the college or personnel associated with the college may be billed to the Progress Energy Brunswick Plant Emergency Preparedness Unit.
16. BCC agrees that Progress Energy shall not be charged for the use of these facilities in support of Brunswick County Emergency Management. Regularly scheduled drills and exercise dates and times shall be provided to BCC as far in advance as possible. This will allow the primary locations to be placed on the college schedule to minimize conflicts with normally scheduled classes.
17. This agreement may not be altered or amended except by a written instrument signed by all parties hereto.
18. This agreement shall remain in place until either party gives a one year notice in writing to the other party that the agreement will be terminated. It is expected that this agreement shall be effective until the Nuclear Regulatory Commission license for the Brunswick Plant expires.

(Signature on File)
Progress Energy
Vice President - Brunswick Nuclear Plant

(Signature on File)
Brunswick Community College
President

(Signature on File)
Brunswick County
County Manager

(Signature on File)
Brunswick County
Emergency Management Director

February 26, 2004

Mr. Randy Thompson
Brunswick County Emergency Management
3325 Old Ocean Highway
PO Box#9
Bolivia, North Carolina 28422

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Memorandum of Understanding Concerning Use of the Brunswick County
EOC Complex for an Alternate Emergency Operations Facility (EOF)

Dear Mr. Thompson:

In response to recent terrorist events, the Nuclear Regulatory Commission and Brunswick Nuclear Plant Emergency Preparedness Organization identified a need to establish an Alternate Emergency Operations Facility (EOF) that is remote from the plant site. The purpose of this memorandum is to document an agreement with you to allow our use of County-approved locations inside the Brunswick County EOC Complex for this purpose.

If needed, we plan to assemble selected members of our Technical Support Center, Operations Support Center, and Emergency Operations Facility at your facility in the Garage Area and Conference Room 113. Brunswick Plant personnel will require access during normal daytime hours and off-hours, using their Progress Energy ID badges. Brunswick County 911 personnel will allow entry of personnel after hours. Personnel will require use of the Garage Area of the EOC Complex as an assembly location, and selected personnel will set up and use Conference Room 113 as the Alternate EOF. They will use basic county-owned equipment in the Conference Room and specialized equipment which has been installed by Progress Energy, including additional supplies located in a storage closet. Note: Activation of our facility will not require relocation of your EOC staff.

Additionally, we intend to periodically use the facility for drill purposes and will coordinate our drill schedule with you in advance.

(Signature on File)

Ed O'Neil
Manager, Support Services
Brunswick Steam Electric Plant
Unit Nos. 1 and 2

(Signature on File)

Randy Thompson
Emergency Management Director
Brunswick County, North Carolina

APPENDIX C
BRUNSWICK NUCLEAR PLANT (BNP)
OFF-SITE AGENCY SUPPORT SUMMARY

<u>Function (NUREG-0654, II.A)</u>	<u>Primary Responsibility</u>	<u>Support Responsibility</u>
1. <u>Command and Control</u>		
a. Onsite	BNP	NRC
b. Offsite	State, County	FEMA Progress Energy Corp
2. <u>Accident Classification</u>		
a. Onsite	BNP	NRC
b. Offsite	N/A	N/A
3. <u>Warning</u>		
a. Onsite	BNP	Local
b. Offsite	County	State, USCG
4. <u>Notification</u>		
a. Onsite	BNP	Local
b. Offsite	BNP	State, Local, Media
5. <u>Communications</u>		
a. Onsite	BNP	NRC
b. Offsite	State, County	Progress Energy Corp. Commercial Phone Co., Progress Energy
6. <u>Transportation</u>		
a. Onsite	BNP/Employees	Local
b. Offsite	Local/Residents	FEMA, State, County
7. <u>Traffic Control Security</u>		
a. Onsite	BNP Security	County
b. Offsite	County	State
8. <u>Accident Assessment</u>		
a. Onsite	BNP	HEEC, HNP, RNP,
b. Offsite	State	NRC, GE, County, Progress Energy Corp., FEMA, EPA, DOE, CAP

APPENDIX C
BRUNSWICK NUCLEAR PLANT (BNP)
OFF-SITE AGENCY SUPPORT SUMMARY

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

APPENDIX C
BRUNSWICK NUCLEAR PLANT (BNP)
OFF-SITE AGENCY SUPPORT SUMMARY

17. Exercises
- | | | | |
|----|---------|-------|--|
| a. | Onsite | BNP | Progress Energy Corp.,
NRC |
| b. | Offsite | State | State, County, Progress
Energy Corp., BNP |
18. Recovery/Reentry
- | | | | |
|----|---------|-------|--|
| a. | Onsite | BNP | BNP, RNP, HNP,
Progress Energy Corp.,
NRC, GE, FEMA, |
| b. | Offsite | State | Local, Progress Energy,
DOE, EPA, U.S. DHHS,
USDA |

Note:

BSEP	Brunswick Steam Electric Plant
CAP	Civil Air Patrol
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FEMA	U.S. Federal Emergency Management Agency
GE	General Electric
RNP	Robinson Nuclear Plant
HEEC	Harris Energy & Environmental Center
NRC	U.S. Nuclear Regulatory Commission
USCG	United States Coast Guard
USDA	U.S. Department of Agriculture
US DHHS	U.S. Department of Health & Human Services
HNP	Harris Nuclear Plant

APPENDIX D

This Appendix has been superseded by the BNP Emergency Procedures.

APPENDIX E
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 on site in the plant First Aid Office, if possible. In this facility, initial evaluation of the severity of the injury will be made by first-aid and medical personnel, 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 Doshier Memorial Hospital where special facilities for treatment of contaminated patients have been provided (see Section E.2.2).

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 his alternate senior physician.

E.2. MEDICAL EMERGENCIES

E.2.1 ON-SITE 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 at the Plant First Aid Office located in the O&M Building (if possible) by site medical personnel. This includes all injuries thought not to require immediate hospitalization.

E.2.2 HOSPITALIZATION

If emergency medical treatment can best be given at Doshier Memorial Hospital in Southport (or another facility as may be advised by a competent medical authority), the injured person may be transported to Doshier Memorial Hospital. Doshier Memorial Hospital is the primary hospital for treating medical emergencies occurring at the Brunswick Plant, with New Hanover Regional Medical Center being the backup. OPEP-03.9.3, Transport of Contaminated Injured Personnel, will be followed to prevent the spread of radioactive contamination to off-site areas and facilities. If possible, contaminated clothing and equipment should be removed from the patient, or he should be wrapped in clean sheets or clothing to prevent contamination of the transporting personnel and vehicle.

Medical assistance is immediately available at the Southport area from two general practitioners, both of whom are on the staff of Doshier Memorial Hospital, and who have agreed to provide medical assistance for contaminated patients. Also, the U. S. Department of Energy Radiological Assistance Team will provide medical assistance, if required.

E.2.3 TREATMENT FACILITY

A specially designated emergency area is maintained in readiness at Doshier Memorial 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 ON-SITE MEDICAL SERVICES

Agreement has been reached with doctors in Southport who will provide medical services at the plant site when required. Personnel who are contaminated and who require medical treatment may be treated by a doctor in the Plant's First Aid Office.

E.2.5 EMERGENCY EQUIPMENT

An emergency kit is maintained at Doshier Memorial 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 City of Southport Rescue Squad has agreed to respond to all emergency calls from the plant, just as they respond to other calls from the Southport area.

APPENDIX F
TECHNICAL BASIS FOR SOURCE TERM MIXES

NUREG-1228, Table 2.2 describes the core inventory and coolant concentrations (BWR).

Source Term Categories

Source terms are based upon the core melt sequences, four categories of core damage: 1) normal coolant leakage, 2) spiked coolant leakage, 3) gap release, and 4) in-vessel core melt. 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 mix matrix that is dependent on two parameters, whether or not the fuel is uncovered, and the length of time that the fuel is uncovered. A separate isotopic release fraction is developed for each accident sequence. The major isotopic release fractions are those fractions of core inventory that are released either through failure of the fuel cladding and melting of the core within 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 into account to the extent consistent with the failures that led to the particular accident sequence. To make the results manageable, the accident sequence and the accident isotopic release are grouped. NUREG-1465 is utilized 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.

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 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. RTM-96, Table C-5 lists the reduction factors, and Table C-6 escape fractions are used in developing source term categories that account for removal process. In order to select the proper mix, a release pathway and estimated time duration of core uncover is determined. Reduction factors are applied as scaling factors, as described in NUREG-1228.

There remain three source term special cases of accident mixes which are handled separately in the dose assessment process. 1) Fuel stored in a pool, and the fuel is uncovered; 2) Fuel stored in a pool that is damaged underwater; and 3) Damage to fuel cladding stored in a dry storage cask. Fuel release fractions used in these accidents are derived from NUREG/CR-6451.

References

1. NUREG-1465, Accident Source Terms for Light Water Nuclear Power Plants, Draft Report for Comment, U.S. Nuclear Regulatory Commission, Washington, DC, June 1992
2. RTM-96, Response Technical Manual, Vol. 1, Rev. 4, U.S. Nuclear Regulatory Commission, Washington, DC, October 1996-NUREG/BR 0150
3. NUREG-1741, RASCAL 3.0: Description of Models and Methods
4. NUREG-1228, Source Term Estimation during Incident Response to Severe Nuclear Power Plant Accidents. 1988
5. BNP Calc. 0B21-0556, Rev. 0

APPENDIX G
MINIMUM PROCEDURES REQUIRED TO IMPLEMENT THE
SECTIONS OF THE PLAN

<u>PLAN</u>	<u>PROCEDURES</u>	
Section 1: Introduction	N/A	
Section 2: Emergency Classifications	0PEP-02.1	Initial Emergency Actions
	0PEP-02.1.1	Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency
Section 3: Emergency Response Organization	0PEP-02.6.6	Environmental Monitoring Team Leader
	0PEP-02.6.12	Activation and Operation of the Operational Support Center
	0PEP-04.7	Brunswick Emergency Notification (Automated Telephone) System
	0PEP-02.6.26	Activation and Operation of the Technical Support Center (TSC)
	0PEP-02.6.27	Activation and Operation of Emergency Operations Facility (EOF)
	0PEP-02.6.28	Off-Site Protective Action Recommendations
	0PEP-02.6.20	Dose Projection Coordinator
	0PEP-02.6.21	Emergency Communicator
	0PEP-02.1.1	Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency
	0PEP-02.6.29	Activation and Operation of the Joint Information Center (JIC)

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Section 4: Emergency Measures

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- 0PEP-02.1 Initial Emergency Actions
- 0PEP-02.1.1 Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency
- 0PEP-03.1.3 Use of Communication Equipment
- 0PEP-03.4.7 Automation of Off-Site Dose Projection Procedure
- 0PEP-03.8.2 Personnel Accountability and Evacuation
- 0PEP-03.9.2 First Aid and Medical Care
- 0PEP-03.9.3 Transport of Contaminated Injured Personnel
- 0PEP-03.9.6 Search and Rescue
- 0PEP-04.5 Public Education and Information
- 0PEP-03.7.6 Emergency Exposure Controls
- 0PEP-03.7.7 Onsite Radiological Controls

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Section 5: Emergency
Facilities and
Equipment

0PEP-03.4.7 Automation of Off-site Dose
Projection Procedure

0PEP-03.5.5 Environmental Monitoring and Plume
Tracking

0PEP-04.7 Brunswick Emergency Notification
(Automated Telephone) System

0PEP-04.2 Emergency Facilities and Equipment

Section 6: Maintaining
Emergency
Preparedness

0PEP-04.1 Record Keeping and Documentation

0PEP-04.2 Emergency Facilities and Equipment
0PEP-04.3 Performance of Training, Exercises,
and Drills

0PEP-04.5 Public Education and Information

0PEP-04.6 Radiological Emergency Kit
Inventories

Section 7: Recovery

0PEP-02.7 Recovery

APPENDIX H

CROSS-REFERENCE BETWEEN NUREG-0654 EVALUATION CRITERIA AND BRUNSWICK RADIOLOGICAL EMERGENCY RESPONSE PLAN

<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
A.1.a	3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 Appendix C
A.1.b	3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
A.1.c	Figures 3.1-1, 3.2-1, 3.4-1
A.1.d	3.0, 3.2.1
A.1.e	3.2, 3.9
A.2.a	N/A
A.2.b	N/A
A.3	Appendix B
A.4	3.0, 3.2, 3.3, 3.4, 3.5
B.1	3.0, 3.1, 3.2
B.2	3.0, 3.2.1
B.3	3.0, 3.2.1
B.4	3.0, 3.2.1
B.5	3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
B.6	Section 3 Appendices A, B, C, E Figure 3.2-1

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
B.7	Section 3
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B.7.b	3.3.1, 3.3.3, Section 7.0
B.7.c	3.2.1, 3.5
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B.8	3.7.1, Table 3.5-1
B.9	3.7.2, Appendix B, Appendix C, Appendix E
C.1.a	3.8.4.1
C.1.b	3.8.4
C.1.c	3.8
C.2.a	N/A
C.2.b	3.3.1.1, 3.5.8, Figure 3.2-1
C.3	5.7.6, 3.7.1, 3.8
C.4	3.7, 3.8, Appendix B, Appendix C, Table 3.5-1
D.1	Section 2.0
D.2	Section 2.0
D.3	N/A
D.4	N/A

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
E.1	3.9, 4.1, 4.4.1
E.2	3.2, 3.5, 3.9
E.3	3.9
E.4.a-n	OPEP-02.6.21
E.5	N/A
E.6	3.9, 4.4.6, OPEP-02.6.21
E.7	3.9, 4.4.7
F.1.a	3.9, OPEP-02.6.21
F.1.b	3.9, EPL-001, OPEP-02.6.21
F.1.c	3.9, EPL-001, OPEP-02.6.21
F.1.d	3.9, EPL-001, OPEP-02.6.21, OPEP-03.1.3
F.1.e	3.2, 3.9, EPL-001 OPEP-02.6.21, OPEP-04.7
F.1.f	3.9, EPL-001, OPEP-02.6.21
F.2	EPL-001, Table 3.5-1
F.3	6.1.2.1

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
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G.2	4.4.7.1, 6.1.4
G.3.a	3.6, 5.5
G.3.b	5.4, 5.5
G.4.a	3.6
G.4.b	3.6
G.4.c	3.6, 4.4.7.1
G.5	6.1.4
H.1	5.2, 5.3
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H.3	N/A
H.4	3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.9 Table 3.5-1
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H.6.b	5.7
H.6.c	5.7.6
H.7	5.7.4, 5.12
H.8	5.7.2
H.9	5.3, Table 5.0-2
H.10	Procedure OPEP-04.6
H.11	Procedure OPEP-04.6 EPL-001
H.12	5.0, 5.7.6
I.1	Section 2, OPEP-02.1, Section 5.0
I.2	4.2, Section 5.0
I.3.a	4.2.2, PEP-03.6.1, PEP 03.6.3, Appendix F
I.3.b	4.2.2, 4.2.3, OPEP-03.4.7, PEP-03.5.5
I.4	4.2.2, OPEP-03.4.7, OPEP-03.6.1
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NUREG-0654 <u>Criterion</u>	Brunswick <u>Section(s)</u>
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I.8	4.2.1, 4.2.2, 4.2.3, 4.2.4
I.9	4.2
I.10	4.2
J.1.a	4.4.2, 6.1.1, EPL-001
J.1.b	4.4.2, 6.1.1, EPL-001
J.1.c	4.4.2, 6.1.1
J.1.d	4.4.2, 4.4.6
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J.6.c	4.4.3
J.7	4.1.5, 4.4.7
J.8	4.4.7.3
J.9	N/A

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J.10.b	Figures 1.1-1, 1.1-2, 1.1-6
J.10.c	3.9, 4.4.6
J.10.d	N/A
J.10.e	N/A
J.10.f	N/A
J.10.g	N/A
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
J.11	N/A
J.12	N/A
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K.3.a	4.4
K.3.b	4.4
K.4	N/A

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
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K.5.b	4.4.4.1, 4.4.4.2, 4.4.5
K.6.a	4.4.4
K.6.b	4.4.4
K.6.c	4.4.4
K.7	4.4.4, 4.4.5
L.1	Appendix B, Appendix E, 5.10
L.2	4.4.5, 5.10, Appendix B, Appendix E
L.3	N/A
L.4	3.7.2.1, 3.7.2.2, 4.4.5, Appendix B, Appendix E
M.1	OPEP-02.7, Section 7.0
M.2	7.2, Figure 7.2.1, Table 7.2-1, OPEP-02.7
M.3	7.2, OPEP-02.7
M.4	Figure 1.1-6
N.1.a	6.1.2.2
N.1.b	6.1.2.2
N.2.a	6.1.2.1
N.2.b	6.1.2.1

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
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N.2.d	6.1.2.1
N.2.e	6.1.2.1
N.3.a-f	6.1.2
N.4	6.1.2.2
N.5	6.1.2.2
O.1	6.1.1
O.1.a	6.1.1
O.1.b	N/A
O.2	6.1.1
O.3	6.1.1
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Progress Energy

BRUNSWICK NUCLEAR PLANT

I
Information
Use

PLANT OPERATING MANUAL

VOLUME XIII

EMERGENCY RESPONSE PLAN

(OERP)

***RADIOLOGICAL EMERGENCY RESPONSE PLAN
(ERP)***

REVISION 64

OERP

Rev 64

REVISION SUMMARY

Revision 64 of OERP corrects page numbers on the List of Effective Pages

Revision 63 of OERP includes the following changes:

- Changed "Carolina Power & Light Company" to "Progress Energy" in Section 1.0 header to reflect company name change.
- Revised Section 4.2.1 and Appendix F, Technical Basis for Source Term Mixes, to reflect dose projection software change from CPLDOSE to RASCAL.
- Changed annual safety information "calendar" to annual safety information "brochure" and deleted "map" from safety information brochure reference in Section 4.4.7.1.
- Deleted Unit 1 and Unit 2 Turbine West and East Moisture Separator Drain Tank information from Table 5.7.2, Area Radiation Monitoring System Channel Identification & Meter Ranges, due to decommissioning of monitors in those locations.
- Deleted Table 7.2-1, Designation of Key Recovery Organization Personnel, and description of table in Section 7.2.
- Revised letters of agreement for Yaupon Beach Fire Department, Boiling Spring Lakes Fire Department, and New Hanover Regional Medical Center in Appendix B, Agreements, based on administrative changes. Also added letters of agreement with Brunswick Community College and Brunswick County Emergency Management.

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PROGRESS ENERGY
BRUNSWICK NUCLEAR PLANT (BNP)
RADIOLOGICAL EMERGENCY PLAN (ERP)

1.0 INTRODUCTION

The Emergency Program for the Brunswick Nuclear Plant consists of the Brunswick Radiological Emergency Plan and its implementing Plant Emergency Procedures. The Radiological Emergency Plan may also be referred to as the Emergency Response Plan (ERP) in other plant documents. Also included are the related radiological emergency plans and procedures of state and local organizations. The purpose of these programs is to provide for the protection of plant personnel and the general public and to prevent or mitigate property damage that could result from an emergency at the Brunswick Nuclear Plant. 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 on site and off site.
 4. Effective and timely implementation of emergency measures.
 5. Continued maintenance of an adequate state of emergency preparedness.
- The Supervisor - Emergency Preparedness is the BNP Emergency Planning Coordinator. The BNP Emergency Plan and Procedures are contained in the Plant Operating Manual (POM), Volume 13, which consists of the following parts:

Book 1, Radiological Emergency Plan (ERP)
Book 2, Plant Emergency Procedures (PEP)

A list of procedures required to implement the plan can be found in Book 2.

1.1 GENERAL INFORMATION

1.1.1 Plant Site Description

The Brunswick plant site is located in the southeastern portion of North Carolina 2 1/2 miles north of Southport in Brunswick County, and 16 miles south of Wilmington, North Carolina, in adjacent New Hanover County. (See Fig. 1.1-1 and Fig. 1.1-2.) Approximate coordinates of the reactor buildings are latitude 33° 57'30" N and longitude 78° 00'30" W. The Brunswick Plant utilizes two General Electric Company boiling water reactors. The major structures of the Brunswick plant which contain radioactive materials are the Units 1 and 2 reactor buildings, the turbine building and radwaste building.

Figure 1.1-1 shows a site plan for the Brunswick plant and Figure 1.1-3 shows the location of the buildings at the site.

1.1.2 Plume Exposure Emergency Planning Zone

The plume exposure Emergency Planning Zone (EPZ) is defined to be the area within an approximate ten-mile radius of the Brunswick plant.

Principal exposure sources from plume exposure pathways are: (a) external exposure to gamma and beta radiation from the plume and deposited material and (b) exposure of internal organs to gamma and beta radiation from inhaled radioactive gases and/or radioactive particulates.

Figure 1.1-2 shows the ten-mile plume exposure EPZ in relation to the location of the Brunswick plant. The plume exposure EPZ includes portions of the North Carolina counties of Brunswick and New Hanover.

The prevailing winds around the Brunswick plant are from the southwest. Figure 1.1-4 presents wind roses for the Brunswick plant site.

1.1.3 Ingestion Exposure Emergency Planning Zone

The ingestion exposure EPZ is defined to be the area within a 50-mile radius of the Brunswick plant.

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

Figure 1.1-5 shows the 50-mile ingestion exposure EPZ in relation to the location of the Brunswick plant. The ingestion exposure EPZ includes the North Carolina Counties of Bladen, Brunswick, Columbus, New Hanover, Onslow, Pender, and Sampson, and the South Carolina County of Horry.

The region within a 50-mile radius of the Brunswick plant site is predominantly rural, with less than one-half the land devoted to farming. The remainder of the region consists of undeveloped, non-utilized marshes and woodlands.

1.1.4 Demographic Information

Demographic information for the 10-mile Emergency Planning Zone is presented in Figure 1.1-6.

The information is presented by (1) local planning zones and (2) distance from plant at 0-2 miles, 2-5 miles, and 5-10 miles, based on the longitude and latitude of the plant site. Since some of the local planning zones extend beyond the 10-mile radius, the total population for the local planning zones is greater than the total population for the 0-10 mile radius.

1.2 SCOPE AND APPLICABILITY

This document describes the Brunswick Radiological 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 2.0 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 accidents having substantial on-site and/or off-site 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 Brunswick plant are summarized in Appendix C and in the state's Emergency Plan.

1.3 SUMMARY OF EMERGENCY PROGRAM

The Brunswick radiological emergency program consists of the Brunswick Radiological 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. The Brunswick plant 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.

1.3.1 Concept of Operations

The Brunswick Radiological Emergency Plan describes the general nature of emergency response activities, the available emergency response resources and facilities, and the means for maintaining emergency preparedness. Specific plant implementing procedures have been developed (or existing ones modified) to describe in detail how involved plant and corporate personnel carry out their specific responsibilities as identified in the Plan.

1.3.1.1 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.

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 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 local governments are summarized herein with details provided in the North Carolina State Emergency Plan.

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 off-site 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 off site, such as taking shelter or 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 activities. The Plan describes post-accident recovery provisions and identifies the transition from the emergency phase to the recovery phase.

1.3.1.2 Emergency Response Resources

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 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 Brunswick 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 Shift Superintendent until relieved by the on-call Site Emergency Coordinator. Because of his overall knowledge, he is best able to bring the full resources of the plant to bear on controlling the emergency. On-site personnel have preassigned roles to support the Site Emergency Coordinator and to implement his directives. These roles, for the purpose of emergency planning, are cast in terms of emergency teams and assignments, each having a designated leader or primary person and alternate(s) assigned to it.

Each team and individual assignment carries with it specific emergency response duties and, where practical, each is provided with an on-shift person to perform those duties on an interim basis. This approach ensures under most conditions that an emergency response duty falls under some predesignated position and provides a smooth transition as additional people are called to the plant, since each one knows ahead of time what his area of responsibilities will be. The Site Emergency Coordinator will also have ready access to the Technical Support Center. This Emergency Facility is comprised of personnel who are knowledgeable of and responsible for engineering and management support. It will assemble 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 directives.

Upon declaration of an Alert, Site Area Emergency, General Emergency, or at the discretion of the Site Emergency Coordinator, the Emergency Operations Facility will be activated and staffed by personnel under the direction of the Emergency Response Manager. The position of Emergency Response Manager is staffed by qualified senior plant management personnel. Once the Emergency Operations Facility has been fully activated, the Emergency Response Manager will be responsible for all off-site emergency response including radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with federal, state, and local agencies. The Emergency Response Manager will manage the corporate response activities, to relieve the Brunswick plant personnel of any activities that could hamper their response efforts, and to marshal the corporate resources needed to properly respond to the emergency.

Progress Energy has a staff of well-trained and experienced engineers, scientists, and technicians. These personnel represent a pool of technical expertise which can be called upon to provide additional support to the emergency response and recovery organizations. Progress Energy personnel will staff a near-site Joint Information Center to interface with the media and general public in order to effectively communicate to the public the nature of an emergency in progress. Available to assist the Brunswick plant in responding to an emergency are Progress Energy personnel assigned to the Shearon Harris and Robinson nuclear plants and the Corporate Offices.

In addition as outlined in Appendix C, 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 local emergency plans. Assistance may also be available from the Nuclear Regulatory Commission, Federal Emergency Management Agency, Department of Energy, and General Electric. The industry resources identified by INPO are also available. Progress Energy is a signatory to the mutual assistance agreement developed by INPO for utilities in the nuclear power industry.

1.3.1.3 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 facilities available include the Brunswick plant Control Room, Operational Support Center, Technical Support Center, Emergency Operations Facility, and Joint Information Center. Each of these facilities, as well as the North Carolina Emergency Operations Center, the Brunswick County Emergency Operations Center, and the New Hanover County Emergency Operations Center, are described in Section 5, Emergency Facilities and Equipment.

1.3.1.4 Emergency Response Plan Maintenance

The Plan, as described in Section 6, provides for maintenance of emergency preparedness by establishing the framework and requirements for training, drills and exercises, and periodic updating. Each Brunswick employee having an emergency response role is trained, and annually retrained, in his area of responsibility and also how his duties fit in with those of others. Each individual must know what is expected of him and what he should expect of others while responding to an emergency. A basic description of the required training for emergency assignment is provided in the 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 integrated plant, state, and local emergency organizations to properly respond to an emergency. The Plan sets forth the frequency and content of such drills and exercises and also establishes how lessons learned will be used to improve the Plan.

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. An Emergency Planning Coordinator is designated to be responsible for overseeing this process as outlined in Section 6.2.

1.4 BRUNSWICK PLANT EMERGENCY PROCEDURES

Plant Emergency Procedures (PEP's) are implementing procedures which 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 or existing procedures modified 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.

1.5 DEFINITIONS

- 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.

Activated - To formally put on active duty with the necessary personnel and equipment to carry out the function required.

Activating - Key personnel are responding as a mandatory step to make the facility operational within the required time.

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.)

Emergency Action Levels - Plant 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.

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.

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

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

Emergency Operations Facility (EOF) - An on-site support facility for the management of overall licensee emergency response including coordination with federal, state, and local officials, coordination of off-site radiological and environmental assessment, and determination of recommended public protective actions. The EOF is located in the TSC/EOF/Training Building.

Emergency Planning Zones (EPZ) - A generic area defined about a nuclear plant to facilitate emergency planning off site. 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 NUREG-0654. (See Figure 1.1-7)

Exclusion Area - Progress Energy-owned property that surrounds the reactor plants as defined in 10CFR100. 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. This is the property boundary used for off-site dose projections. (See Figure 1.1-1)

Joint Information Center (JIC) - A nearsite facility equipped and staffed by Progress Energy, State, County, and Federal Agencies to coordinate the dissemination of information to the news media and general public during an emergency.

Ingestion Exposure Pathway - The potential exposure pathway to the public through consumption of radiologically contaminated water and foods such as milk or fresh vegetables. The basis for planning within the 50-mile EPZ.

Manning - A person is in the facility to respond to incoming calls.

Nuclear Incident - An event or series of events, either deliberate or accidental, leading to the release or potential release into the environment of radioactive materials in sufficient quantity to warrant consideration of protective actions.

Operational - The facility is executing its designed functions and tasks.

Operational Support Center (OSC) - The place to which emergency response support personnel report and standby in an emergency situation. The OSC is located in the Operations and Maintenance (O&M) Building.

Plume Exposure Pathway - The potential exposure pathway to the public through (a) whole body external exposure from the plume and from deposited materials, and (b) inhalation of radioactive materials. The basis for planning within the 10-mile EPZ.

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

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

Protected Area - The double-fenced security area with intrusion detection devices immediately surrounding the plant structures. (See Figure 1.1-3.)

Protective Action - An activity conducted in response to an incident or potential incident to avoid or reduce radiation dose to members of the public (sometimes referred to as protective measure).

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

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

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

Restricted Area - Any area, access to which is controlled by Progress Energy for purposes of protection of individuals from exposure to radiation and radioactive materials.

Severe Accident Management Guidelines (SAMGs) - Severe Accident Management Guidelines are entered when Emergency Operating Procedures (EOPs) are not able to maintain adequate core cooling.

Staffing - Key personnel are responding to the facilities as a proactive step to prepare for potential operational status.

State - The State of North Carolina.

- Technical Support Center (TSC) - 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. The TSC is located in the TSC/EOF/Training Building.

Unrestricted Area - Any area to which access is not controlled by the licensee for protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

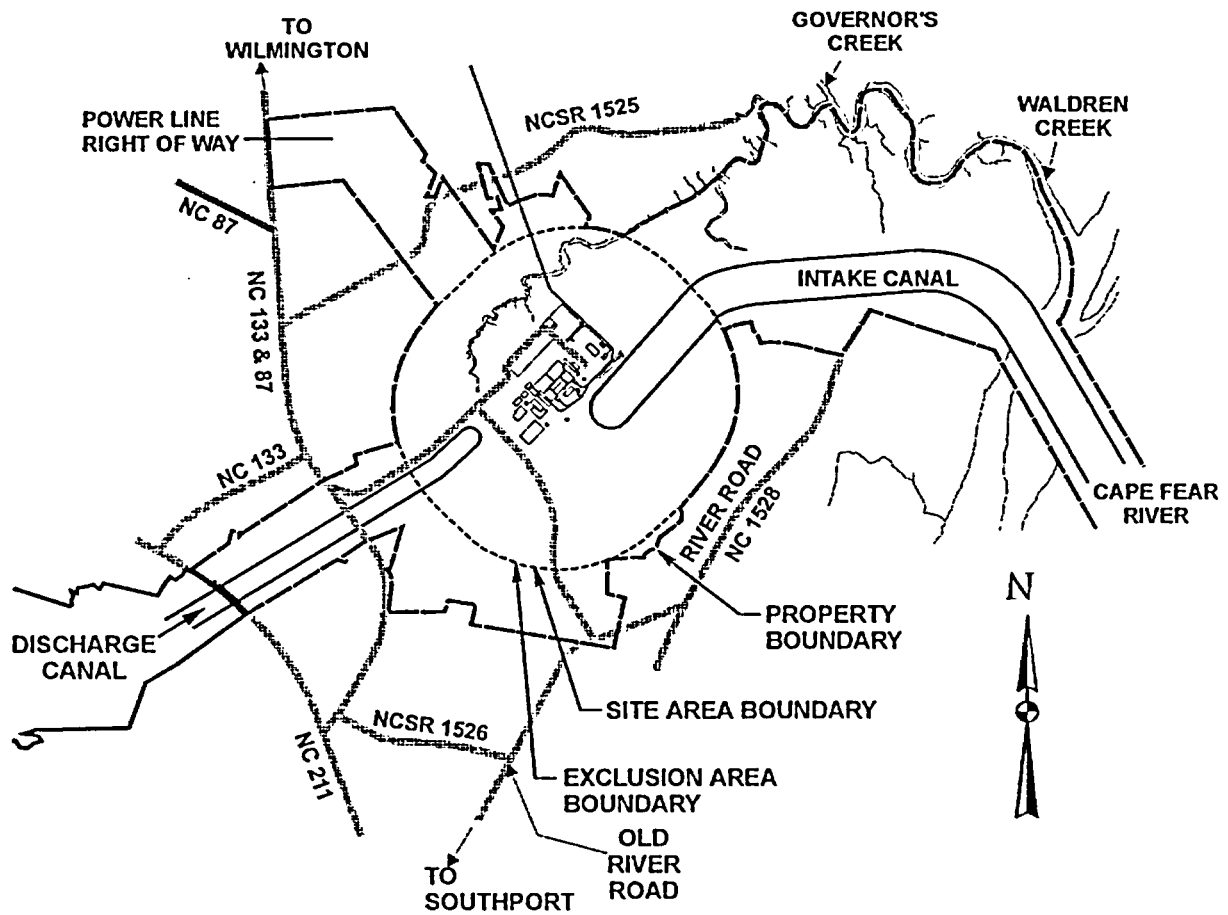
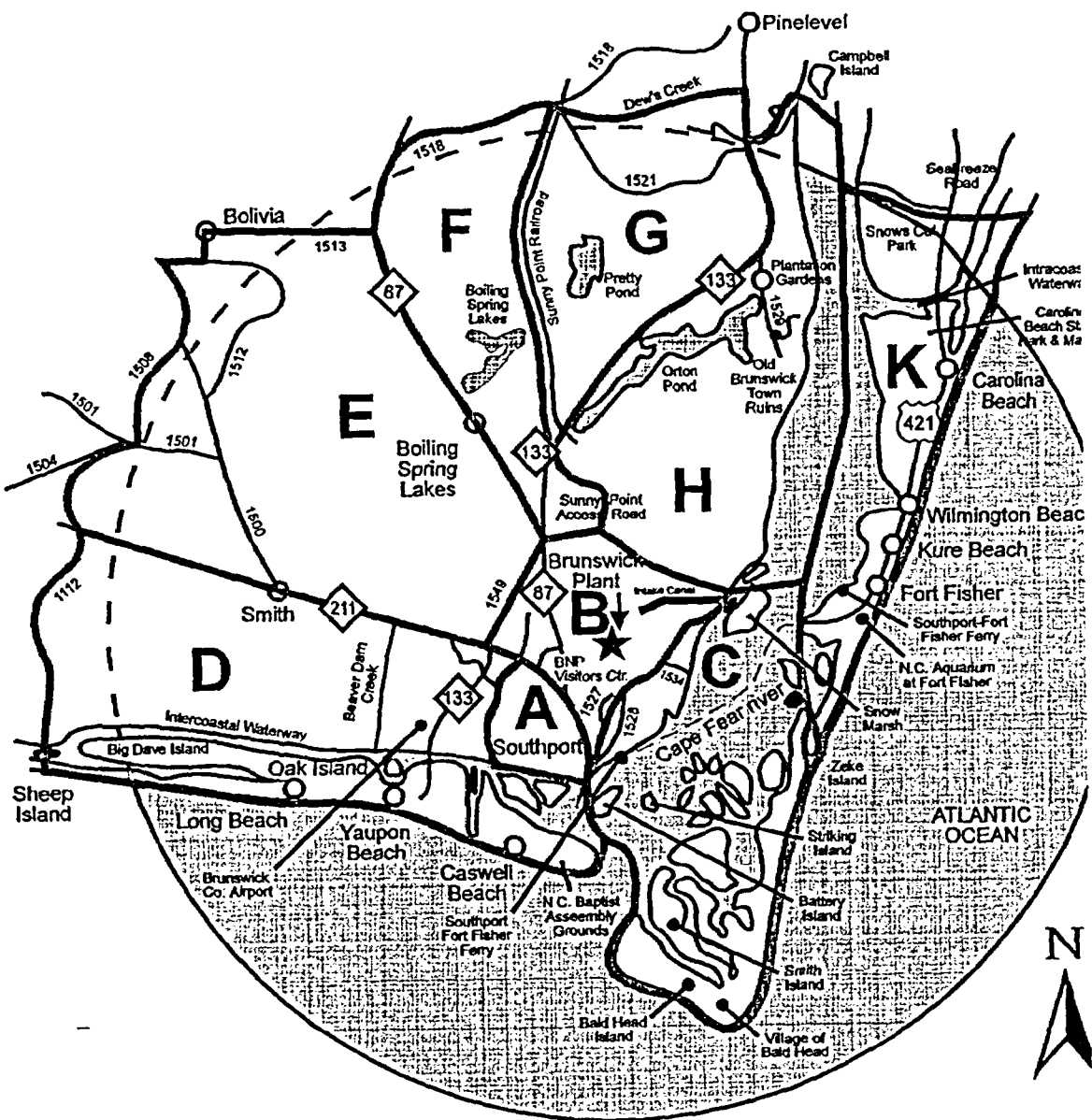
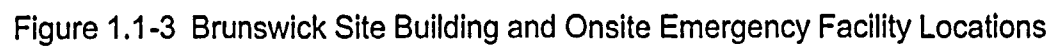
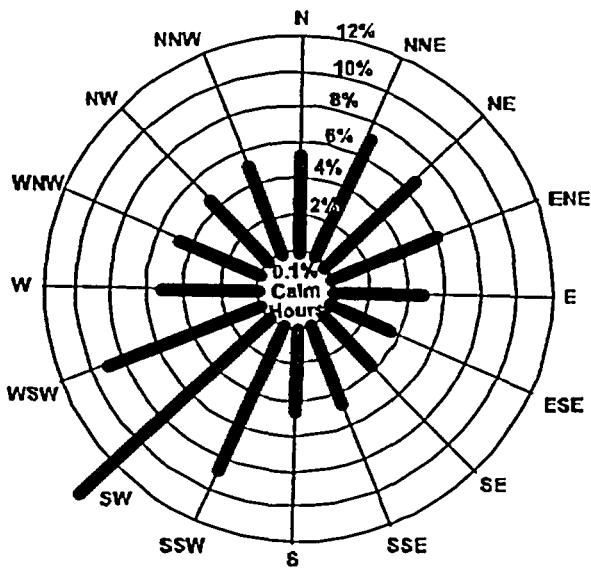


Figure 1.1-1 Brunswick Site Plan

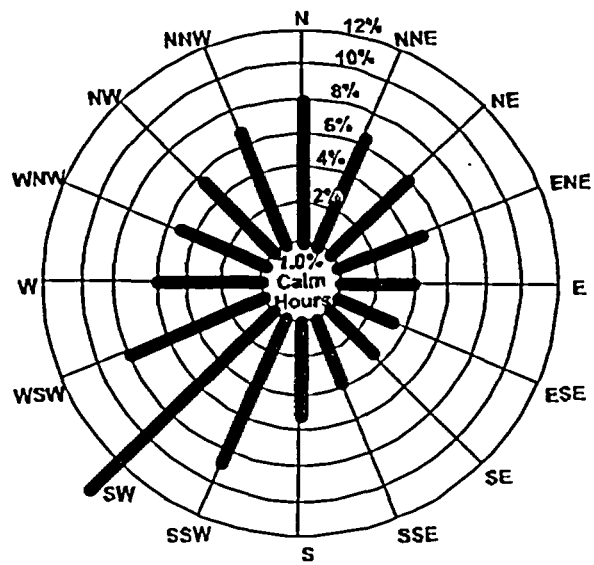






Upper Level Wind Rose

On-site Met Data 1976-1979
 Upper Level Data = 343 feet AGL
 Average Velocity = 15.16 mph
 Data Recovery = 97.9%

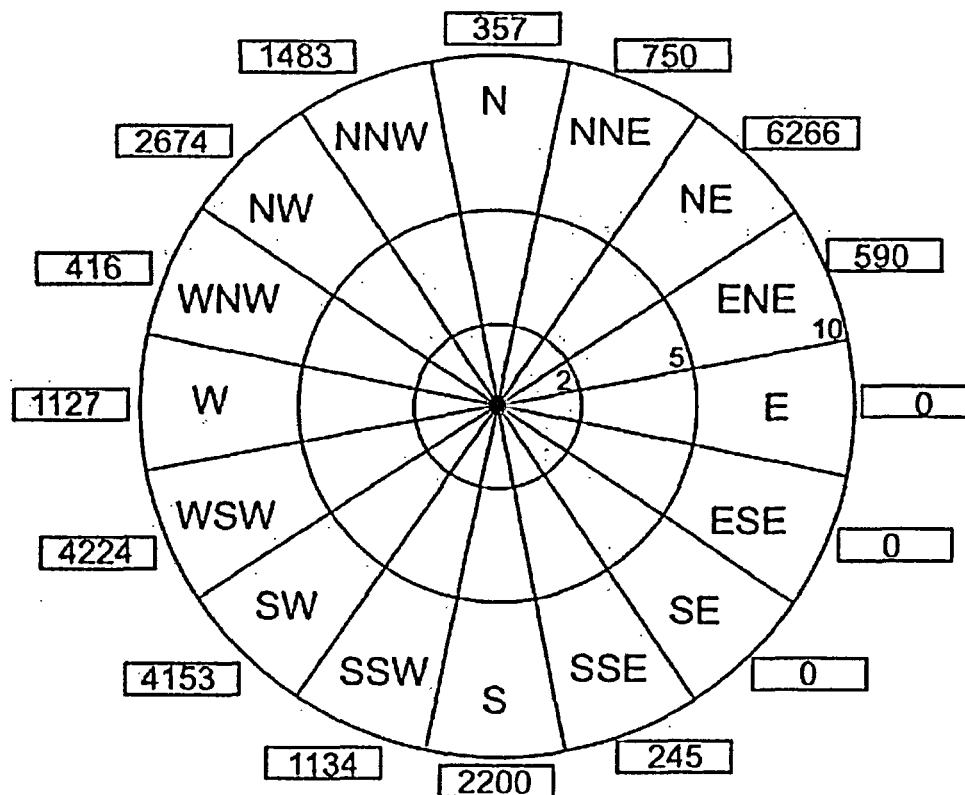


Lower Level Wind Rose

On-site Met Data 1976-1979
 Lower Level Data = 38 feet AGL
 Average Velocity = 8.54 mph
 Data Recovery = 97.8%

Figure 1.1-4 Wind Roses





POPULATION TOTALS			
RING MILES	RING POPULATION	TOTAL MILES	CUMULATIVE POPULATION
0-2	1074	0-2	1074
2-5	5697	0-5	6771
5-10	18848	0-10	25619

25619 Total Segment Population
0 to 10 miles

*LOCAL PLANNING ZONES	RES. POP.	PEAK POP.
A	1542	932
B	1609	16387
C	787	1335
D	9297	32422
E	2077	745
F	3193	1204
G	890	64
H	818	1073
K	6511	55517
TOTALS	26724	109679

*See Figure 1.1-2

BRUNSWICK SITE
PLUME EXPOSURE PATHWAY
10 Mile Emergency Planning Zone
Figure 1.1-6 Population Totals

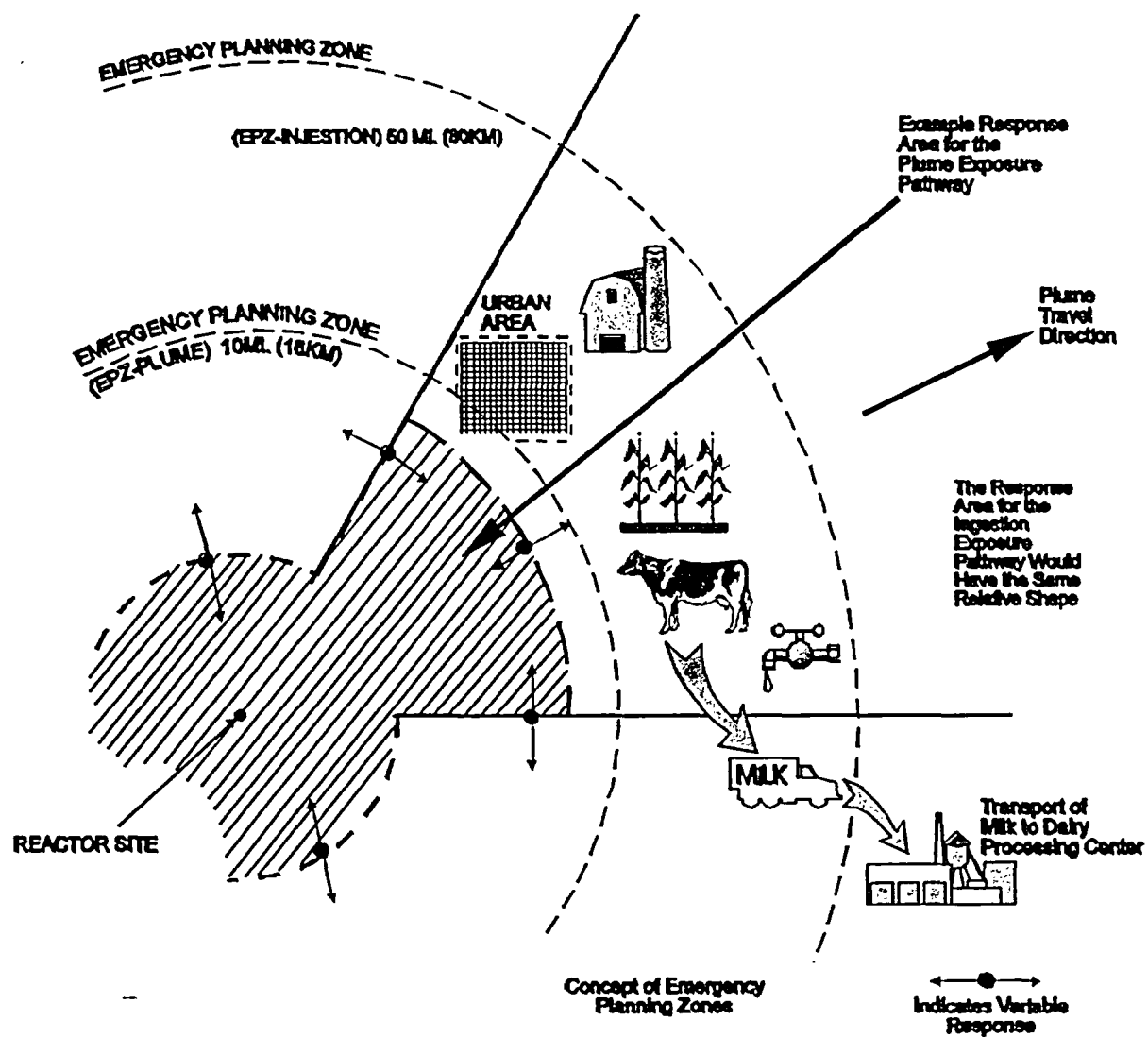


Figure 1.1-7 Concept of Emergency Planning Zones

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

2.0 EMERGENCY CLASSIFICATIONS

A key element of this Plan is a preplanned 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 3 in turn will discuss the plans for notification of off-site agencies and mobilization of emergency teams and how they may vary with the level of the emergency.

2.1 GENERAL CLASSIFICATION SYSTEM

The operating staff is provided formal training to recognize and respond in a logical manner to off-normal plant conditions. Plant abnormal and emergency instructions are designed to allow plant personnel to mitigate the consequences of and correct an off-normal condition as quickly as possible following its occurrence. The procedures identify the conditions requiring implementation of this Plan. Figure 2.0-1 shows the basic response sequence that is followed during any off-normal condition.

The types of potential emergencies vary in probability and consequences. Accordingly, any system that categorizes emergencies must be both wide-ranged and flexible. This Plan adopts the NRC recommended standard of four general classes of emergencies and, as described below, includes the methods for determining the class in which a specific type of event should be placed.

There are three basic tests or criteria that must be considered in deciding which emergency class exists. These are:

1. Radioactivity release: Is a release occurring; and if so, what is its magnitude?
2. Core damage: If no release to the environment is occurring, has there been a release of fission products from the fuel? Do the radiation levels in the coolant system or primary containment pose a potential danger to the public?
3. Plant degradation: Has the plant responded to equipment failures or external events as designed? If the plant has not responded as expected, what is the prognosis for a safe recovery, or alternately that further degradation will occur (e.g., corrective action is not likely to be successful or cannot be accomplished before a major release occurs)?

The categorization of events and combinations of events according to one of the four emergency classes is implemented through Emergency Action Levels (EALs). These are specific sets of plant conditions, instrument readings, and events which, unless promptly corrected, coincide with the conditions associated with one of the four emergency classes.

EALs for the Brunswick Nuclear Plant are included as an attachment to the Radiological Emergency Response Plan and are provided in OPEP-02.1, Initial Emergency Actions.

The EALs have been selected with a view towards ensuring that a reasonable time is available to diagnose the specific cause of the emergency and attempt immediate corrective actions.

- Once an emergency is declared, assessments of core and containment conditions, projected releases, and resultant exposures are performed. The results, along with other plant status assessments, are reported to off-site agency officials who decide, based on these inputs, whether or not protective actions for the public are to be implemented. The relationship of dose assessment values to the Environmental Protection Agency (EPA) Protective Action Guides (PAGs), and the possibility of approaching or exceeding the PAGs, will specifically be reported. Section 4 describes the relationships between emergency classes, PAGs, and various emergency measures.

Each of the four emergency classes are discussed below.

2.2 UNUSUAL EVENT

Unusual events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant.

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 judgment, the status of the plant warrants it. Initiating conditions are established as EALs for the determination of this class.

Specific EALs for an Unusual Event are listed in OPEP-02.1, Initial Emergency Actions.

An Unusual Event does not require the activation of the entire on-site emergency organization, but the Site Emergency Coordinator can direct that additional personnel come to the site to support shift workers. Off-site 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 3.9, and emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during an Unusual Event are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert Site Area Emergency, General Emergency.

2.3 ALERT

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

Initiating conditions are established as EALs for determination of an Alert and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare an Alert whenever he concludes that plant conditions so warrant.

Events in this class may reflect a significant degradation in the safety of the reactor. However, releases from such events will be small. Off-site mobilization and assessment actions will be initiated to ensure that emergency personnel are readily available to respond if situations become more serious and confirm that radiation levels in the environment do not require protective actions off-site. Notifications and activation of emergency organizations are discussed in Section 3.9, and the emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during an Alert are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

2.4 SITE AREA EMERGENCY

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

Initiating conditions are established as EALs for determination of the Site Area Emergency class and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare a Site Area Emergency whenever he concludes that plant conditions so warrant.

The Site Area Emergency class includes Alert conditions where the plant personnel have been initially unsuccessful in restoring the facility to a safe shutdown condition. It also includes Alert conditions where subsequent additional malfunctions have occurred. 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 set into motion all personnel on site and off site that would be required to perform actions up to and including the evacuation of a near-site area. If circumstances warrant, the process of public notification may begin as directed by the state plan. Section 3.9 discusses the planned process of notification and activation of emergency organizations. Emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during a Site Area Emergency are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

2.5 GENERAL EMERGENCY

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

Initiating conditions predictive of a major radiological release are established as Emergency Action Levels for determination of the General Emergency class and are listed in OPEP-02.1, Initial Emergency Actions. Additionally, the Site Emergency Coordinator will declare a General Emergency whenever, in his judgment, conditions exist that warrant activation of emergency response efforts including off-site 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 off-site exposures will approach or exceed EPA recommended protective action guides unless protective measures are instituted. Notifications and activation of emergency organizations are discussed in Section 3.9. The emergency measures to be taken are described in Section 4. Specific emergency actions to be followed during a General Emergency are contained in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

THE SHIFT SUPERINTENDENT
LEARNS OF AN OFF-NORMAL
CONDITION, DETERMINED BY
INSTRUMENT READINGS OR
OBSERVATION. SHIFT
SUPERINTENDENT IMPLEMENTS
OPEP-02.1, WHICH FLOWS AS

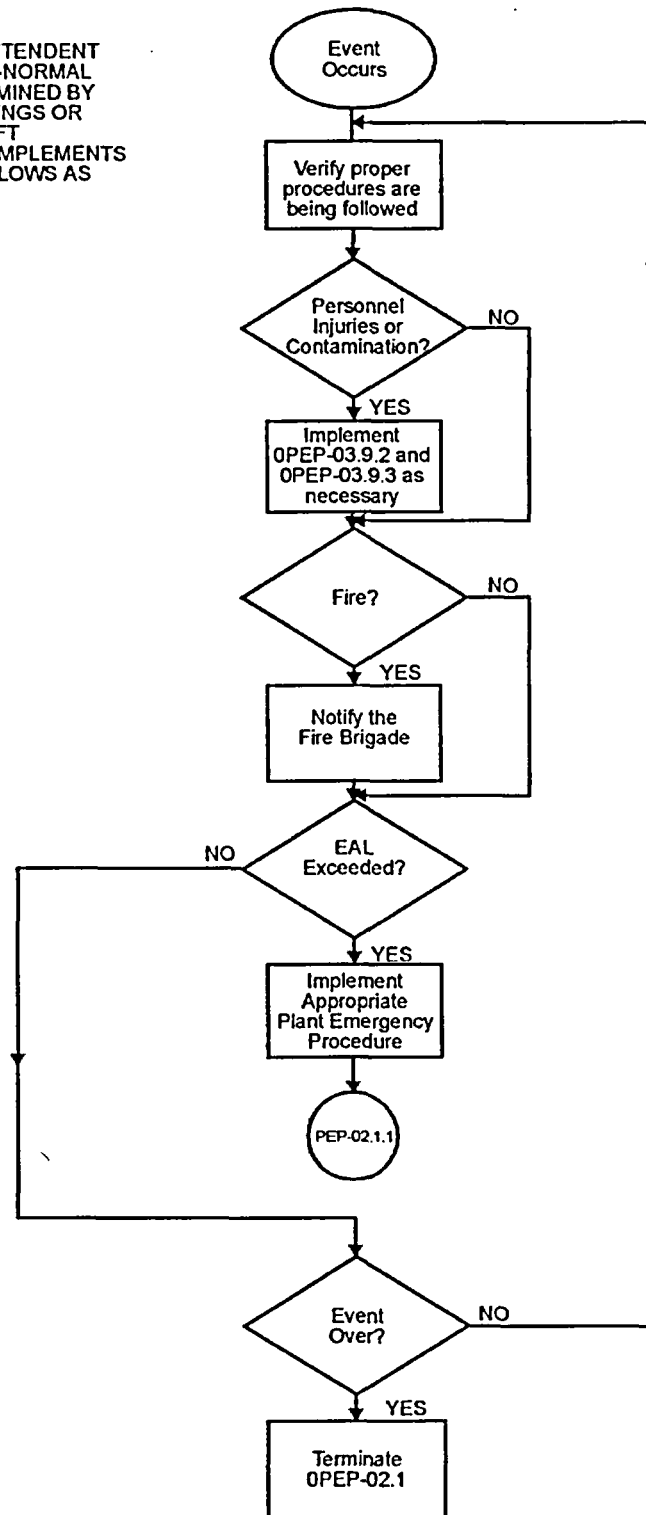


Figure 2.0-1
Response Sequence to Off-Normal
Conditions

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

3.0 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 Brunswick Radiological Emergency Plan employs an organizational concept that has four features.

1. 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
2. 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, he is freed of all other responsibilities and thus able to devote his entire effort to managing the emergency response.
3. Specific individuals are assigned the responsibility of carrying out predefined critical actions.
4. 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. 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 2, 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, off-site 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.

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 off-site related activities. The Site Emergency Coordinator maintains overall on-site emergency response responsibilities and reports to the Emergency Response Manager.

Initially the Site Emergency Coordinator would be the Operations Shift Superintendent who would act in that capacity until formally relieved by the designated On-Call Site Emergency Coordinator or alternate (qualified SECs are listed in EPL-001) in the Technical Support Center. In this manner, the individual usually in charge of activities in the Control Room is responsible for initiating the necessary emergency response, but the emergency response organization On-Call SEC is expected to assume management of 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 designated emergency response personnel 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 personnel assume the responsibility for performing the required emergency response actions until properly relieved by another emergency response organization member qualified for the position. All emergency response organization members are trained as described in Section 6.1.1.

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 on-site personnel.

A current call list of emergency response organization members is maintained in the Control Room and procedures are available to make this notification. Since many of the Brunswick plant management staff and substantial numbers of its support personnel live in the site vicinity (i.e., Southport and surrounding areas) additional assistance can be quickly provided.

3.1 NORMAL OPERATING ORGANIZATION

The greatest number of people on site occurs during day shift operations. The plant crew available to respond to an emergency provides a broad spectrum of specialties including operations, maintenance, engineering, radiochemistry, health physics, fire protection and security. The Plan, as will be discussed, utilizes the basic plant organizational structure and cadre of available manpower as the principal means of responding to an emergency condition. This is accomplished by assigning the management of various emergency response functions to individuals in accordance with their routine operational responsibilities. To illustrate, Radiological Emergency Teams will be directed by Environmental & Radiation Control, management personnel, who are the individuals responsible for directing day-to-day radiation control programs. In the event of an emergency, they report directly to the Site Emergency Coordinator and continue to be responsible for radiological matters.

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

- Each operating shift will normally consist of a Shift Superintendent, two Senior Control Operators, four Control Operators, seven Auxiliary Operators, three Health Physics Technicians, one Chemistry Technician, and one Shift Technical Advisor (STA). Deviation from the normal shift complement is allowed as long as the minimum shift complement, as described in Technical Specification 5.2.2.c and UFSAR Table 13.1.2-1, is maintained and appropriate action is taken (see Figure 3.1-1).

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. It should be noted that they are initially responsible under all circumstances, and remain so until relieved. 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.

3.2 ON-SITE EMERGENCY ORGANIZATION

The minimum on-site emergency organization for non-normal working hours, backshifts, and holidays for the Brunswick Plant is described above in Section 3.1. Compliance with the requirements of NUREG 0654 Table B-1 has been assured. Guidance for augmenting the emergency organization is found in the notification checklists of the plant emergency procedures. Individuals' names and roles in the emergency organization, phone numbers, and alternates are also described in the plant emergency procedures. EPL-001 lists the individuals and alternates qualified to fill the positions described for the TSC, OSC, and EOF.

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. Since a large portion of the Brunswick staff lives in the vicinity of the plant, additional personnel will be available for communications, on-site and off-site 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 on-site organization. The on-site 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 Table B-1 of NUREG 0654. Additional personnel will continue to supplement the plant emergency organization as necessary to meet the requirements of this Plan. Periodic drills will be conducted to determine that this augmentation schedule can be maintained.

As an aid toward assuring that critical emergency actions are given proper attention, the plant's emergency procedures provide for emergency response personnel established to carry out specific types of functions such as accident assessment and off-site notification. As discussed below, emergency response organization personnel 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 Figures 3.2-1, 3.4-1, and 3.6-1.

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 records (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 in the Plan's implementing procedures. The Emergency Response Organization personnel telephone numbers are available in the Control Room. In all emergencies, the on-duty Shift Superintendent is authorized and qualified to implement the Plan and to classify the emergency condition.

3.2.1 Site Emergency Coordinator

As discussed in Section 3.1, direction and coordination of emergency actions on-site (and off-site until relieved by the Emergency Response Manager) are prime responsibilities of the Site Emergency Coordinator. The initial determination that an emergency exists will be made in the Control Room, based on measured plant parameters. Therefore, the Shift Superintendent is initially the Site Emergency Coordinator. If the Shift Superintendent becomes incapacitated for any reason, the Senior Control Operator of the unaffected unit will assume the responsibilities of the SEC. He will be in command of the on-site emergency organization until relieved by the designated On-Call Site Emergency Coordinator. The Shift Superintendent will be relieved by the first qualified SEC to arrive on site so that he may devote his attention to plant operations. The Shift Superintendent remains responsible for the decision making of Severe Accident Management Guidelines strategies.

Names and phone numbers of qualified Site Emergency Coordinators are available in EPL-001. He will also appoint an Emergency Communicator who will relay messages and maintain notification records throughout the emergency.

Any individual who may be required to serve, even temporarily, in the capacity of a Site Emergency Coordinator must be qualified and trained in accordance with the training program described in Section 6.1.1.

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

1. Coordinating and directing the combined activities of Brunswick personnel in the Control Room, Technical Support Center, Operational Support Center, and elsewhere on the site.
2. Classifying the emergency.
3. Notifying off-site plant, corporate, and local agency personnel, as well as on-site 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 off-site agencies.)
4. Issuing instructions to emergency response personnel 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 on-site resources.
9. 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 recommendations to authorities responsible for off-site emergency measures. Further, while he may consult with others, he may not delegate the responsibility to upgrade or downgrade the emergency classification or to declare that the emergency has been terminated. He may delegate the responsibility to announce that the emergency has been terminated. He 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. (Responsibility for mobilization of recovery efforts transfers to the Emergency Response Manager upon activation of the EOF.)

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.

3.2.2 Plant Operators

During an emergency, the Plant Operators (including the Shift Superintendent) 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 instructions and perform initial calculations of projected off-site consequences. The Operators are responsible for implementing actions (including Severe Accident Management Guidelines) as directed by the Shift Superintendent. Specific emergency response duties of the Plant Operators are found in the Plant Emergency Procedures which implement the Plan and in other Operations procedures.

3.3 Technical Support Center

The Site Emergency Coordinator, as discussed above, 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 directives, a Technical Support Center has been established. The Technical Support Center consists of management-level personnel. Upon declaration of an Alert, Site Area Emergency, or General Emergency, the Technical Support Center will be notified to immediately assemble. The SEC and other TSC staff members perform monitoring and evaluations required for Severe Accident Management Guidelines, and provide advice and recommendations to the Shift Superintendent and Control Room Operators.

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

- Plant Operations
- NRC Communications
- Radiological Control
- Technical Assessment
- Security

Directors are assigned to be responsible for activities within each category.

The Directors within the Technical Support Center may be relieved by designated qualified plant personnel (phone numbers are listed in EPL-001).

3.3.1 Plant Operations Director

The Plant Operations Director is responsible to the Site Emergency Coordinator for providing liaison with the Control Operators, Shift Superintendent, and Technical Support Center. He is responsible for providing technical and administrative assistance to the Control Operators. This position also performs monitoring and evaluations required for Severe Accident Management Guidelines. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.2 Radiological Control Director

The Radiological Control Director 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; and providing liaison with the Emergency Operations Facility and with the Radiological Control Manager. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.3 Technical Assessment Director

The Technical Assessment Director is responsible to the Site Emergency Coordinator for providing technical and administrative direction to the Accident Assessment Team and for providing liaison with the Technical Analysis Manager after the EOF is activated. The Technical Assessment Director is responsible for performing the monitoring and evaluations required for Severe Accident Management Guidelines. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.4 Security Director

The Security Force is composed of personnel qualified in security, personnel accountability, and evacuation procedures and practices.

The Security Director is responsible to the SEC for providing direction to the Security Force during a declared emergency and providing liaison with the state and local law enforcement agencies. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.5 Communications Director

The Communications Director in the TSC reports to the Site Emergency Coordinator. He is responsible to make plant-wide announcements over the Public Address System, ensure NRC notifications are performed, and supervise the administrative staff. Responsibilities of this position are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center and OPEP-02.6.21, Emergency Communicator.

3.3.6 Radiological Control Communicator

The Radiological Control Communicator is responsible to the Radiological Control Director for expediting communications between the director and the Radiological Emergency Teams. The responsibilities and objectives of the Radiological Control Communicator are contained in OPEP-02.6.26, Activation and Operation of the Technical Support Center.

3.3.7 Accident Assessment Team Leader

One of the principal groups housed within the Technical Support Center is the Accident Assessment Team. The specific responsibilities of the Accident Assessment Team are as follows:

- A. Analyze mechanical, electrical, instrument and control problems and determine alternate solutions.
- B. Analyze thermohydraulic and thermohydrodynamic problems and develop alternate courses of action to resolve them.
- C. Analyze and evaluate accident conditions and develop guidance for the Site Emergency Coordinator and Operations personnel on protection of the core.
- D. Perform monitoring and evaluations to support Severe Accident Management Guidelines.

The Accident Assessment Team Leader is responsible to the Technical Assessment Director and provides technical and administrative direction to the Accident Assessment Team.

3.4 Operational Support Center

3.4.1 Emergency Repair Director

The Emergency Repair Director 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 cleanup activities during an emergency. These responsibilities include providing technical and administrative direction to any emergency repair team that may be formed during the emergency and to the Operational Support Center Mission Coordinator. Responsibilities of this position are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.2 Operational Support Center Mission Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an OSC Mission Coordinator will report to the Emergency Repair Director. This individual will direct the activities of the mechanical, electrical, and I&C personnel requested to report to the OSC. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center. He will coordinate OSC response activities with the E&RC and Operations Coordinators.

3.4.3 Operations Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an Operations Coordinator will report to the Emergency Repair Director. This individual will coordinate the activities of operations and Fire Brigade personnel with the OSC Mission Coordinator and E&RC Coordinator. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.4 Environmental & Radiological Control (E&RC) Coordinator

Upon the decision of the Site Emergency Coordinator to activate the Operational Support Center, an E&RC Coordinator will report to the Emergency Repair Director. This individual will direct the activities of the radiological controls (HPs) and chemistry personnel requested to report to the OSC. He will coordinate OSC response activities with OSC Mission Coordinator and Operations Coordinator. His responsibilities and objectives are contained in OPEP-02.6.12, Activation and Operation of the Operational Support Center.

3.4.5 Radiological Emergency Teams

The Radiological Emergency Teams consist of members of the Environmental & Radiation Control organization and of other plant or off-site 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 direct guidance.

The general functions of the various Radiological Emergency Teams include:

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

Radiological emergency teams are formed from the pool of available personnel who assemble in the Operational Support Center. These teams are in addition to the emergency repair teams that are formed from the pool of mechanics, electricians, and instrument technicians to perform repair missions in the plant.

The radiological emergency teams formed are determined by the radiological conditions that require their services. The following teams may be necessary:

1. Plant Monitoring - responsible for conducting in-plant and inside the protected area monitoring to include air sampling, direct radiation monitoring, and smear surveys to determine radiological conditions.
2. Post Accident Sample - responsible for obtaining and analyzing highly radioactive gas and/or liquid samples necessary for source term determination and core damage assessment.
3. Personnel Protection and Decontamination - responsible for monitoring and verifying that personnel and vehicles exiting the protected area and the site are free of radioactive contamination.

3.4.6 Fire Brigade

When conditions require activation of the emergency facilities, the on-shift Fire Brigade is incorporated into the Operational Support Center.

The Fire Brigade consists of a Shift Incident Commander and a minimum of four fire brigade members who provide fire brigade, first aid, search and rescue, chemical/hazardous materials response, and confined space entry services. Fire Brigade members will be the on-shift operators, or other personnel qualified as Fire Brigade members. The Fire Brigade, when incorporated into the OSC, functions as a team under the direction of the Operations Coordinator. The Fire Brigade is staffed on a 24-hour basis.

3.5 Emergency Operations Facility

The Emergency Operations Facility is activated by the On-Call Emergency Response Manager when he is notified by the Site Emergency Coordinator that an Alert or higher emergency condition exists at Brunswick. Guidance for activation and operation of the EOF is contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.1 Emergency Response Manager

The Emergency Response Manager is responsible for providing liaison between the Site Emergency Coordinator and off-site support personnel (Corporate Headquarters, Joint Information Center, state and federal agencies) and marshalling off-site support as required to support the Site Emergency Coordinator. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.2 Administrative and Logistics Manager

The Administrative and Logistics Manager is responsible to the Emergency Response Manager for providing assistance to the Emergency Response Manager and site personnel in administrative, logistics, communications, and personnel support, as requested. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.3 Technical Analysis Manager

The Technical Analysis Manager 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 for the Emergency Response Manager to consultants, regulatory agencies, architect-engineers, and General Electric. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.4 Radiological Control Manager

The Radiological Control Manager is responsible to the Emergency Response Manager for coordinating off-site radiological and environmental assessment and recommending to the Emergency Response Manager protective actions necessary to protect the public health and safety. The responsibilities and objectives of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.5.5 Environmental Monitoring Team Leader

The Environmental Monitoring Team Leader is responsible to the Radiological Control Manager when the EOF is activated, for providing technical and administrative direction to the Environmental Monitoring Team. Two Environmental Monitoring Teams will be made available for deployment. If additional monitoring teams are needed, they may be requested from the Shearon Harris Plant or the H. B. Robinson Plant. The responsibilities and objectives of the environmental monitoring team are contained in OPEP-02.6.6, Environmental Monitoring Team Leader.

3.5.6 Dose Projection Coordinator

The Dose Projection Coordinator is responsible to the Radiological Control Manager and provides technical and administrative direction to the Dose Projection Team when the EOF is activated. Responsibilities of the Dose Projection Team include radiological dose projections and source term determination, contained in OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures, and acquisition and distribution of meteorological data for dose assessment and environmental monitoring purposes. The responsibilities and objectives of the Dose Projection Team are contained in OPEP-02.6.20, Dose Projection Coordinator.

3.5.7 Communications Managers

The Communications Managers report to the Emergency Response Manager. They function as liaison between the off-site organizations and agencies and the on-site emergency organization. Specifically, they relay messages between the ERM in the EOF, Technical Support Center, and the State Emergency Response Team, using the communication equipment discussed in Appendix A of this plan. The responsibilities of this position are contained in OPEP-02.6.21, Emergency Communicator.

3.5.8 Assistant to the Emergency Response Manager (AERM)

The Assistant to the Emergency Response Manager is responsible to the Emergency Response Manager for coordination of information within the Emergency Operations Facility. Reporting to the Assistant AERM are County EOC Representatives (utility representative) that respond to the New Hanover and Brunswick County EOCs. The responsibilities of this position are contained in OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility.

3.6 Joint Information Center

The Joint Information Center is activated by the Emergency Response Manager when he is notified that a Site Area Emergency or General Emergency condition exists at Brunswick. Activation is discretionary for lesser emergency classifications. (Fig. 3.6-1)

3.6.1 Company Spokesperson

The Company Spokesperson is responsible to the Emergency Response Manager for the coordination of plant information with County, State, and Federal representatives for dissemination to the news media and general public. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.2 JIC Director

The JIC Director is responsible to the Company Spokesperson as the primary interface with State, County, and Federal Public Information Coordinators and for the preparation and coordination of all news releases. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.3 Company Technical Spokesperson

The Company Technical Spokesperson is responsible to the JIC Director for the acquisition, coordination, and interpretation of plant technical information disseminated to the news media and general public. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.4 Administrative Coordinator

Administrative Coordinators are responsible to the JIC Director for initial JIC facility setup, and the coordination of logistical, security, and administrative duties. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.6.5 Public Information Director

Public Information Directors are responsible to the JIC Director for monitoring and coordinating the flow of media and general public information in the Joint Information Center. The responsibilities of this position are contained in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

3.7 OFFSITE ORGANIZATION ASSISTANCE

Should conditions at the plant degrade to the extent that further on-site assistance is needed, assistance is available from Corporate personnel, contracted services, and certain locally available service groups, as described in the following subsections.

3.7.1 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 E&RC Technicians), and engineering and consulting services. For example, contracts are maintained with General Electric (the NSSS vendor and architect-engineer for the Brunswick plant).

General Electric will form a Technical Support Team upon request. The team will be composed of personnel with the appropriate technical disciplines, that can be dispatched to the plant site. General Electric will also establish dedicated telephone communications for data transmission until the arrival of the team.

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

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

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

3.7.2 Local Services Support

The Brunswick Plant 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.

3.7.2.1 Medical Assistance

Dosher Memorial Hospital has medical facilities immediately available for the treatment of contaminated and non-contaminated injured personnel.

New Hanover Regional Medical Center will serve as a backup for Dosher Memorial if necessary.

In addition, medical assistance is available on or off site from physicians in the Southport area, all of whom are on the staff of Dosher Memorial Hospital and who have agreed to provide medical assistance to contaminated patients. (See Appendix E, Medical Treatment and Assistance, for more details.)

3.7.2.2 Ambulance Service

The City of Southport Volunteer Rescue Squad has agreed to respond to all emergency calls from the plant, just as they respond to other calls from the Southport area. A copy of the response agreement with the City of Southport Rescue Squad is included in Appendix B.

3.7.2.3 Fire Assistance

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

Southport Fire Department
Boiling Spring Lakes Fire Department
Yaupon Beach Volunteer Fire Department
Oak Island Emergency Services
Sunny Point Fire Department

The Southport Fire Department is the primary fire protection response agency for the Brunswick Plant and will coordinate assistance activities, if required, of the other above agencies. Copies of agreements with local fire departments are contained in Appendix B. In addition, the North Carolina Fire Protection Law makes provisions for volunteer fire departments to furnish fire protection in rural areas.

3.8 COORDINATION WITH PARTICIPATING GOVERNMENTAL AGENCIES

A summary of each governmental organization having major responsibilities for the planning and response to Brunswick Plant radiological emergencies is described below; comprehensive summary tables of emergency response organizations are included in Appendix C; 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.

3.8.1 State of North Carolina

3.8.1.1 Governor's Office

The Governor has the authority to direct and control the State Emergency Management Program. During a declared State of Disaster, he has the authority to utilize all available state resources reasonably necessary to cope with emergencies. His representatives coordinate as necessary with Progress Energy, the Governor of South Carolina, and with local government officials.

3.8.1.2 Department of Crime Control and Public Safety

The Department of Crime Control and Public Safety functions as the State of North Carolina Emergency Planning Coordinator. In that capacity the Department has overall management responsibility for North Carolina's radiological emergency response planning, development, and updating of North Carolina's emergency response plan, and coordination with Progress Energy. The Department coordinates emergency response activities for the State of North Carolina and other government response agencies.

3.8.1.3 Department of Environmental Health and Natural Resources,
Division of Radiation Protection

The Radiation Protection Division, performs radiological field monitoring and laboratory analysis of field samples. This section is responsible for dose assessments and projections and personnel radiological monitoring outside the Brunswick site, and other functions as described in the State Emergency Plan.

3.8.2 Brunswick County

3.8.2.1 Emergency Management Agency

The Brunswick County Emergency Management Agency has overall responsibility for Brunswick County's radiological emergency response planning, development, and updating of Brunswick 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 State of North Carolina's Division of Radiation Protection.

3.8.2.2 Brunswick County Sheriff's Department

The Sheriff's Department emergency response functions are:

- A. Coordinate all local law enforcement and traffic control.
- B. Operate the county warning point on a 24-hour basis.
- C. Provide immediate assistance to facility management and local authorities during initial onset of the emergency.

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

3.8.3 New Hanover County

3.8.3.1 Emergency Management Agency

The New Hanover County Emergency Management Agency has overall responsibility for New Hanover County's radiological emergency response planning, development, and updating of New Hanover 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 State of North Carolina's Division of Radiation Protection.

3.8.3.2 New Hanover County Sheriff's Department

The Sheriff's Department emergency response functions are:

- A. Coordinate all local law enforcement and traffic control.
- B. Operate the county warning point on a 24-hour basis.
- C. Provide immediate assistance to facility management and local authorities during initial onset of the emergency.

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

3.8.4 Federal Agencies

3.8.4.1 Department of Energy, Savannah River Operations Office

The Savannah River Operations Office coordinates, under the Interagency Radiological Assistance Plan (IRAP), 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 State of North Carolina, Department of Environmental Health and Natural Resources, Division of Radiation Protection, or the Nuclear Regulatory Commission (NRC); the 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. The Site Emergency Coordinator or Emergency Response Manager after activation of the Emergency Operations Facility may request this assistance via the NRC or the State. Resources available in the area to facilitate federal assistance include the New Hanover International Airport,

located approximately twenty miles from the Brunswick Plant near Wilmington, North Carolina, which has two runways capable of supporting large commercial aircraft. Also located at the New Hanover International Airport is a National Guard Armory. This area could be used as a Federal Command Post meeting the requirements of IRAP.

3.8.4.2 Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency coordinates, through the Atlanta, Georgia Regional IV Office, federal response as required to supplement that provided by IRAP. A representative from FEMA Region IV will be present at the SERT to coordinate any federal response requested by the state.

3.8.4.3 Nuclear Regulatory Commission (NRC)

The Nuclear Regulatory Commission provides resident inspectors at Brunswick. At the request of Progress Energy, NRC provides additional technical advice, technical assistance, and personnel during and following a radiological emergency. The Director of Regulatory Operations will be notified of radiation incidents in accordance with 10CFR20.2202 and will conduct appropriate investigative activities.

3.8.4.4 U. S. Coast Guard (USCG)

The Coast Guard controls access of navigable waterways in the vicinity of the Brunswick Plant and provides public warning and notification as described in the State Emergency Plan.

3.8.4.5 Meteorological Service

Meteorological Services are under contract with Progress Energy to provide meteorological services during day to day and/or emergency operations.

3.8.4.6 Weather Service

The National Weather Service in Wilmington, North Carolina will provide meteorological information during emergency situations, if required. Data available will include existing and forecasted surface wind directions, wind speed with azimuth variability, and ambient surface air temperature.

3.8.5 Agreements

Appendix B presents copies of letters of agreement with agencies that would not normally be available for assistance through existing state or federal plans but will make certain services available.

3.9 NOTIFICATION AND ACTIVATION

Notification and activation of the on-site and off-site emergency response organizations is dependent upon the emergency classification and is listed in Table 3.5-1. Details of notification responsibilities, communications systems utilized to make the notifications, information required to be transferred to off-site agencies, and notification verification techniques are specifically described in the Plant Emergency Procedures (PEPs) and Appendix A of this Plan. Additional individuals and organizations who might be required to activate are contained in EPL-001.

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

The State of North Carolina and the Counties of Brunswick and New Hanover are responsible for the process of notification of the public. The initial instructions to the public will consist of preestablished emergency messages which will be tailored to reflect whether the event is a Site Area Emergency or General Emergency classification. The following information is typical of that which would be provided in the initial message:

1. Identification of the agency issuing the information.
2. A statement that an emergency condition exists at the Brunswick Nuclear Plant.

3. Brief description of the type of emergency and the nature of the hazard.
4. Identification of the communities or geographical areas affected by the emergency.
5. Recommendations with regard to specific protective measures to be taken by residents of the affected areas. .
6. A statement concerning how the public will receive further. emergency information.

Prewritten emergency messages to be used for public notification are contained in the procedures of the State of North Carolina, and Brunswick and New Hanover Counties.

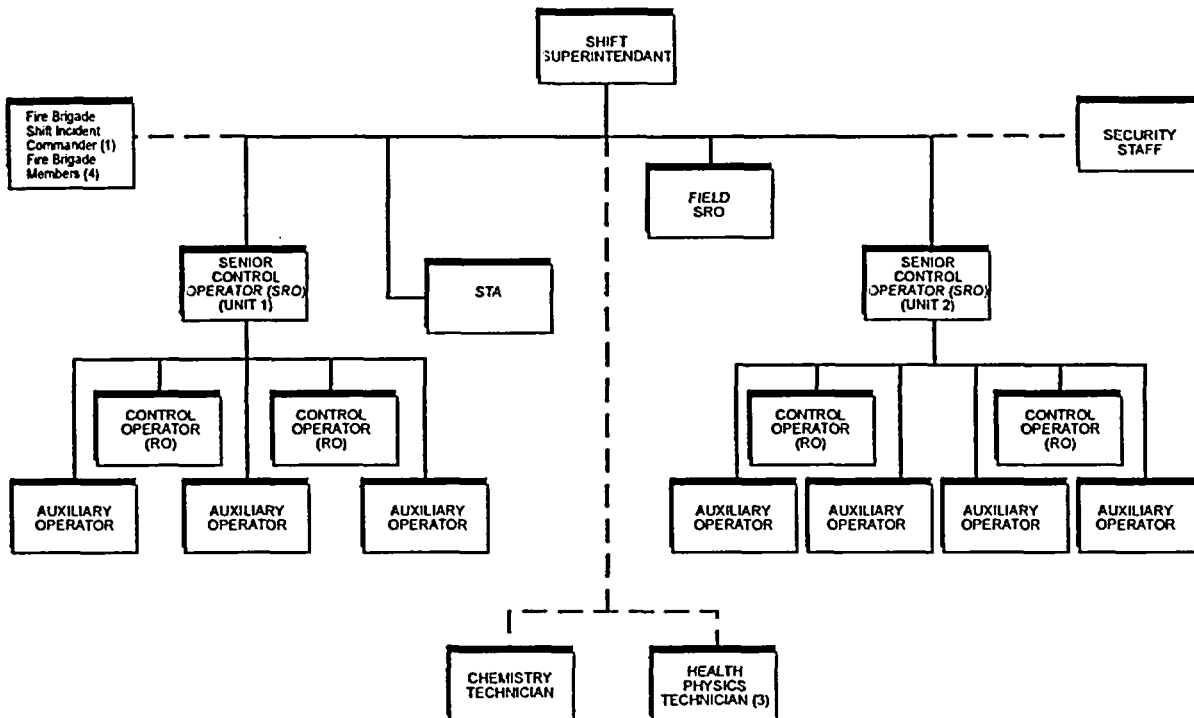


Figure 3.1-1 Brunswick Shift Organization

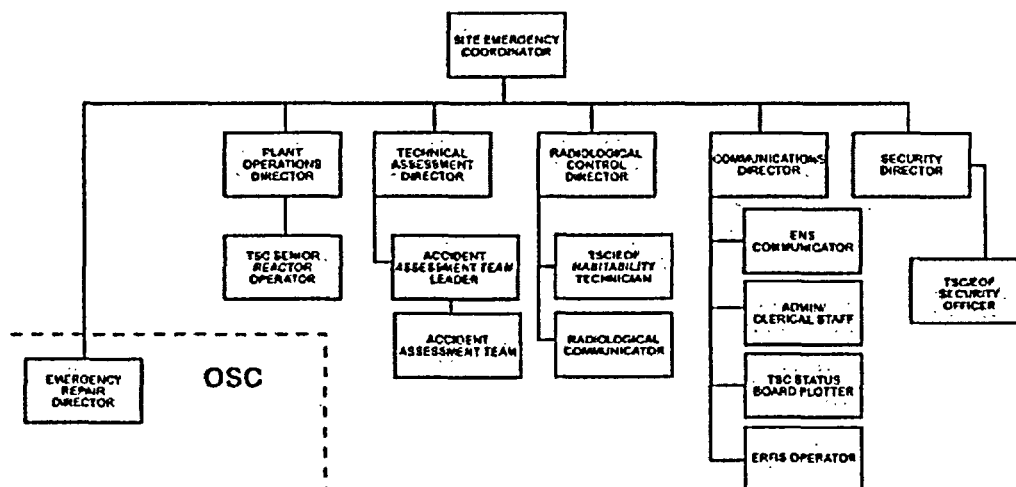
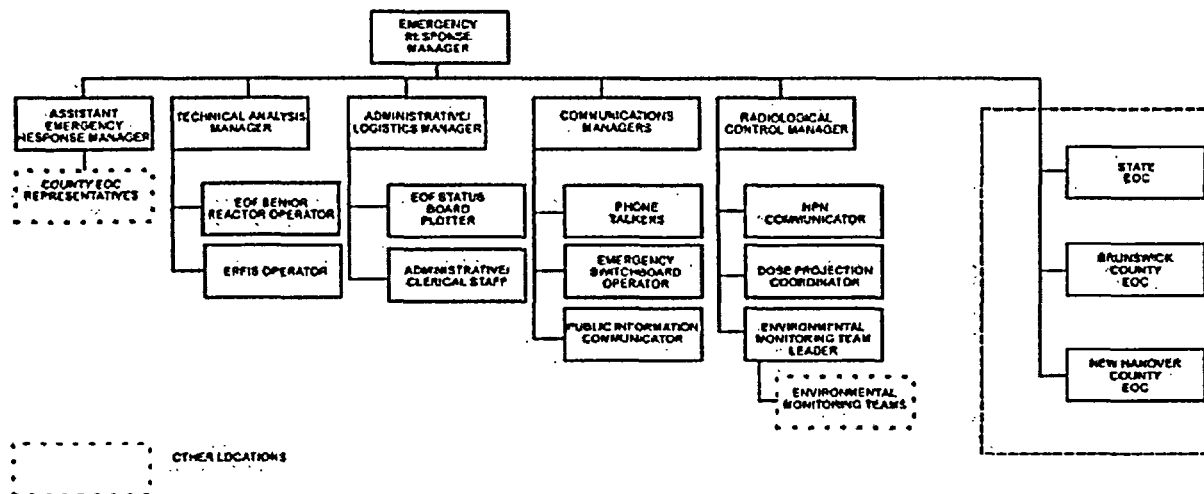
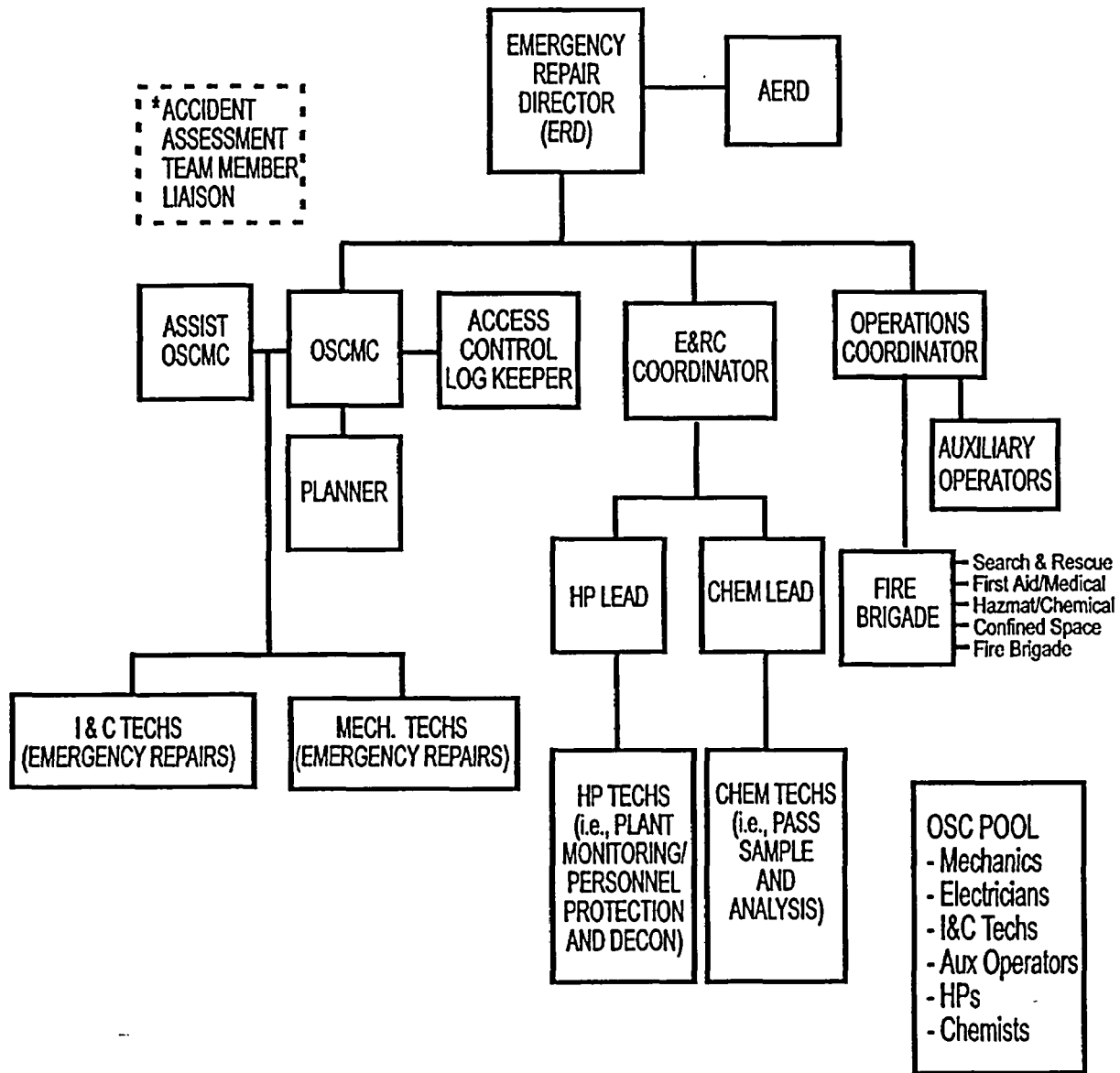


Figure 3.2-1 Brunswick Emergency Organization



* REPORTS TO ACCIDENT ASSESSMENT TEAM LEADER IN TSC.

Figure 3.4-1 Operational Support Center (OSC)

BRUNSWICK

TABLE 3.5-1

NOTIFICATION AND ACTIVATION OF PRINCIPAL EMERGENCY RESPONSE ORGANIZATIONS

<u>Agency</u>	<u>Unusual Event</u>	<u>Alert</u>	<u>Site Emergency</u>	<u>General Emergency</u>
On site: Progress Energy Plant Operators	Activate	Activate	Activate	Activate
Radiological Emergency Teams	(a),(c)	(a)	Activate	Activate
Technical Support Center	(a),(c)	Activate	Activate	Activate
Operational Support Center	(a),(c)	Activate	Activate	Activate
Emergency Operations Facility	(a),(c)	Activate	Activate	Activate
Corporate Headquarters	Notify(a)	Notify(a)	Activate	Activate
Fire Brigade	(a)	(a)	(a)	(a)
Off site:				
Joint Information Center	(a),(c)	(a),(c)	Activate	Activate
State of North Carolina	Notify	Notify(a)	Activate	Activate
Brunswick County	Notify	Notify(a)	Activate	Activate
New Hanover County	Notify	Notify(a)	Activate	Activate
USNRC	Notify	Notify	Activate	Activate
American Nuclear Insurers		Notify	Notify(a)	Activate
U. S. Coast Guard	(c)	(c)	Notify(a)	Activate
Dosher Memorial Hospital	(b)	(b)	(b)	(b)
Southport Volunteer Fire Department	(b)	(b)	(b)	(b)
Southport Volunteer Rescue Squad	(b)	(b)	(b)	(b)
General Electric	(c)	Notify(a)	Activate	Activate
INPO	(c)	Notify	Notify	Notify

(a) Mobilize, if deemed necessary.

(b) Request assistance, if required.

(c) Notify if deemed necessary.

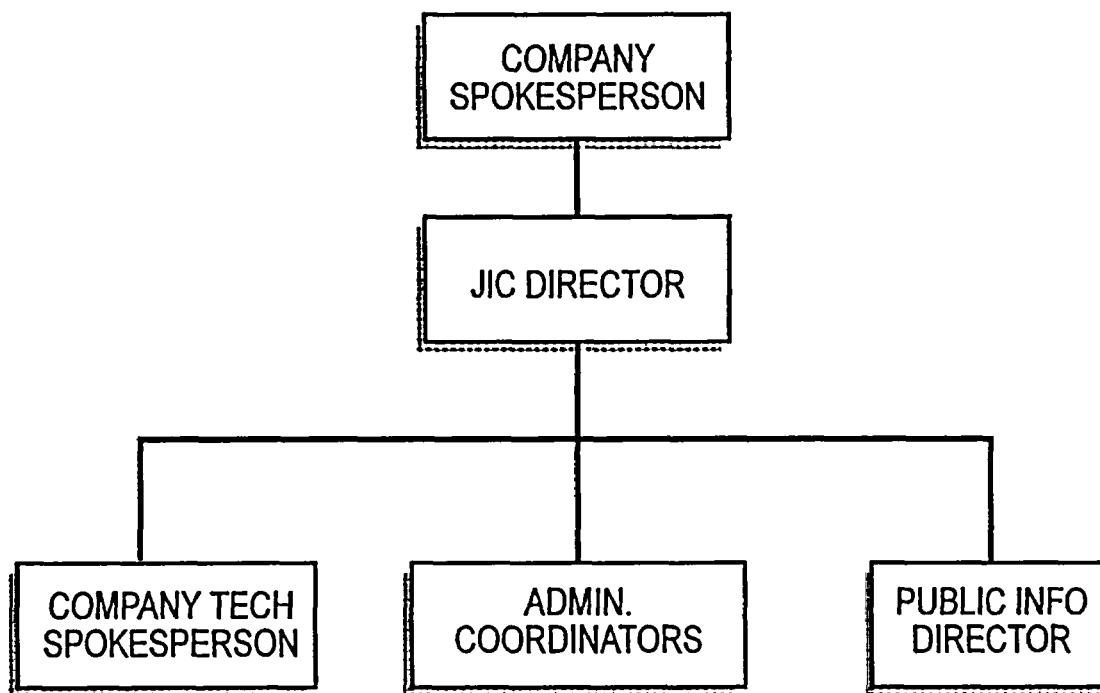


Figure 3.6-1 Joint Information Center (JIC)

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

4.0 EMERGENCY MEASURES

This section identifies the measures to be taken for each class of emergency described in Section 2. The measures presented in this section are used as the basis for the detailed Plant Emergency 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 activities are discussed in Section 7.

4.1 ACTIVATION OF EMERGENCY ORGANIZATIONS

4.1.1 General

The Plant Operating Manual contains Emergency Operating Procedures (EOPs). These are intended to aid the plant operators in responding to an accident. The EOPs identify actions which should automatically occur to safely terminate the accident and manual actions which should be taken to verify that the automatic actions have produced the desired results. The EOPs also provide, 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 OPEP-02.1, Initial Emergency Actions, the operators are instructed to activate the Emergency Plan.

The Shift Superintendent 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 Plant 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 on site and for the general public is contained in Appendix A of this plan and OPEP-03.1.3, Use of Communication Equipment.

4.1.2 Unusual Event

The Shift Superintendent, when informed of conditions that meet emergencies that are classified as an Unusual Event, confirms that an Emergency Action Level has been exceeded and implements OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency. He then is responsible for 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 on-site shift personnel by activating additional emergency personnel described in Section 3. Typical of the personnel that may be notified are E&RC, the Fire Brigade, and the Security Force.

4.1.3 Alert

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 has the potential for limited releases of radioactive material to the environment, off-site groups will be notified to standby so that if the emergency level is escalated, the essential off-site emergency organizational groups can be notified and readily mobilized to augment the on-site emergency groups.

Upon declaration of an Alert emergency classification the Shift Superintendent assumes the role of the Site Emergency Coordinator until relieved by a designated, qualified emergency response organization member. The transfer of Site Emergency Coordinator responsibilities from the Shift Superintendent occurs simultaneously with the activation of the Technical Support Center (TSC).

The Site Emergency Coordinator implements OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency, and notifies the appropriate individuals or groups.

The Site Emergency Coordinator initiates the activation of the Technical Support Center, Operational Support Center, and the Emergency Operations Facility (EOF). The radiological emergency teams will be activated, as appropriate.

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.

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 radiation releases that are projected to escalate beyond the Emergency Action Levels for an Alert.

4.1.4 Site Area Emergency

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

If not done earlier, the Shift Superintendent assumes the role of the Site Emergency Coordinator (SEC) until formally relieved. The SEC activates the necessary emergency organizations and directs that the essential emergency personnel be notified.

If they have not been previously requested to do so, the off-site groups will be mobilized as soon as possible; the Technical Support Center, Operational Support Center, and the Emergency Operations Facility will be activated. Radiation monitoring teams may be augmented to permit an expanded on-site and near site monitoring program.

The Joint Information Center will be activated for the purpose of providing information to the public.

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

4.1.5 General Emergency

Section 2 and OPEP-02.1, Initial Emergency Actions, 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 OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency. This includes arranging for personnel to be available, both on site and off site, to perform actions up to and including evacuation of the affected sectors of the 10-mile EPZ.

If not done earlier, the Shift Superintendent assumes the role of the Site Emergency Coordinator (SEC) until formally relieved. The SEC activates the necessary emergency 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. Recommendations will be made for sheltering and/or evacuation in accordance with the guidelines in OPEP-02.6.28, Off-Site Protective Action Recommendations.

4.2 ACCIDENT ASSESSMENT ACTIONS

4.2.1 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 off-site, depending on the nature and severity of the emergency.

The magnitude of releases of radioactive material can be determined using 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 for other locations. These doses can then be compared to Protective Action Guides. The various steps in this process are discussed in the following sections and in the Plant Emergency Procedures. In the absence of measurable off-site dose rates, protective action recommendations will be made based on the guidelines OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency.

4.2.2 Source Term Assessment

Source terms for assessment of off-site dose consequences to the public can be determined by using effluent and radiation monitor readings, evaluating plant conditions against predetermined scenarios, using analysis results of plant effluent samples, and by manually estimating curie inventories. A thorough discussion of source term development is provided in Appendix F.

4.2.2.1 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 monitors the airborne gaseous and particulate activity released from the Reactor Building and Turbine Building. Additional channels of the radiation monitoring system also monitor the gaseous activity in the air ejectors, primary containment (drywell atmosphere) ventilation system, and main steam line monitors. These channels indicate, record, and alarm in the main control room. The radiation monitoring system gives early warning of a plant malfunction and warns plant personnel of increasing radiation activity which might result in a radiation health hazard. (See OPEP-03.6.3 for procedures on source term assessments and estimates of core damage.)

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 systems 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 Superintendent on duty would be 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 off-site release.
6. The Plant Emergency Procedures would be activated if an emergency is declared.

4.2.2.2 Potential Consequences Based on In-Plant Conditions

The source term can be estimated by evaluating the plant condition against a number of preselected scenarios that best describes the effectiveness of containment, cleanup systems, subcooled, or saturated conditions in the torus, and other relevant parameters. A more thorough discussion of the determination of source terms from plant conditions is described in Appendix F.

4.2.2.3 Post Accident Sampling and Analysis of Reactor and Containment

To aid in the assessment of core damage, area-type monitors utilizing ion chamber detectors are available to monitor radiation levels in the drywell. These monitors have a range of up to 10^7 Rem/hr. The range of monitoring equipment in various locations of the plant has also been extended (e.g., high range noble gas vent monitor and improved procedures for iodine analyses). This information can be used, together with the analyses of primary coolant system contamination levels, to develop an assessment of the types and quantities of various materials that have been released.

Additionally, capabilities have been provided to permit sampling for chemical and radioanalysis under a wide range of accident conditions. Samples can be taken from effluent streams such as the plant stack to determine total release quantity and radionuclide mix, or they can be taken from the RCS, drywell, and torus to determine radionuclide mix. The collection and analysis of samples can be performed without incurring radiation exposures to individuals in excess of 10CFR20.1201 limits.

The procedures for obtaining samples of gases and liquids during normal operation (such as a sample of primary coolant) can also be safely used during a wide spectrum of accident conditions. However, there are 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 and equipment has been installed at the sample panels to minimize the time required to obtain samples and to reduce the radiation levels during transport and analysis of samples. Beyond these measures, post accident sampling stations are located in the breezeway on the 20-foot level. This permits the collection of samples even if access to the Reactor Building is lost. This station can be used to safely withdraw samples of reactor coolant from the recirculation instrument racks in parallel with the jet pump flow indicator and to withdraw samples of water in the torus.

4.2.3 Dose Projection and Meteorological Systems

Once the source term is estimated, exposures to on-site and off-site individuals can be estimated as described in OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures. The technical basis for the methodology for performing dose projection is described in Appendix F. Prior to receipt of information from the emergency radiation monitoring teams, exposure rates at various locations on site and off site 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 and wind velocity, are used to determine the atmospheric dispersion conditions. Normally, the plant computer will provide a readout of the stability condition, but alternate methods are available. Rapid evaluation of potential radiation levels of any downwind area can be made through the use of calculated dispersion factors and the calculated release rate of airborne radioactive material from the plant.

The Brunswick Nuclear Plant has an on-site 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 5.7.2.

Currently, the BNP staff has an automated dose projection capability as described in OPEP-03.4.7, Automation of Dose Projection Procedures. By entering critical plant data and meteorological information obtained from the on-site meteorological station, dose projections can be made for various locations using the dose assessment program. This function has been designed and implemented to allow for the rapid determination of centerline doses for immediate use by plant personnel.

Additionally, contract meteorologists are to be contacted by plant personnel.

Meteorological data display is available for remote interrogation as part of the Emergency Response Facility Information System (ERFIS). This satisfies the NUREG 0654, Rev. 1 criteria for meteorological evaluation and remote interrogation.

4.2.4 Emergency Environmental Monitoring

The Site Emergency Coordinator 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 off-site monitoring is to confirm or modify the initial projections of the consequences of any release of radioactive material into the environment.

The Environmental Monitoring Teams collect samples and survey data and transmit information to and/or receive instructions from the Radiological Control Manager of the EOF staff (or Radiological Control Director, if the EOF is not activated).

Calculational aids, site maps, and actual radiation survey data collected by off-site survey teams define affected areas and assess the extent and significance of the release. 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 off-site consequences including estimates of total population exposure and instituting an expanded program to enable prompt assessments of any subsequent releases from the plant. Progress Energy Environmental Monitoring Teams will coordinate expanded environmental monitoring efforts to assist the agencies identified in Section 3.8. Field monitoring equipment will have at least the capability to detect and measure radioiodine in the vicinity of the plant site as low as $5 \times 10^{-8} \mu\text{Ci}/\text{cm}^3$. 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). 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 by the Emergency Response Manager, if conditions warrant their deployment. Additional teams from the Harris Nuclear Plant and the Robinson Nuclear Plant may be requested, if needed.

4.2.5 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. 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 re-establish the ERDS link automatically through the communication port for ERDS.

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 Operating Manual. 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 6.1.1.

4.4 PROTECTIVE ACTIONS

Protective actions are defined for each emergency class. 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 whole body (TEDE).

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Protective action recommendation guidelines for the general public are described in OPEP-02.6.28, Off-Site Protective Action Recommendations. Protective actions planned for on-site personnel are described in Section 4.4.2. Protective actions for the off-site population-at-risk are the responsibility of state and local agencies; however, representative actions at various dose levels are described in Section 4.4.7. The evaluation of Protective Action Guidelines for the intermediate phase and for ingestion pathways are the responsibility of the state.

4.4.1 Protective Action - Off Site

Notification of off-site agencies will take place when EALs are exceeded (see Section 3.9). Any incident that is projected to result in radiation doses to the general public in excess of the Protective Action Guidelines listed in OPEP-02.6.28, Off-Site Protective Action Recommendations, requires the Site Emergency Coordinator to declare a General Emergency. The Emergency Response Manager will recommend to the state and counties protective measures for the public.

4.4.2 Protective Action - On Site

4.4.2.1 Warning and Notification

The on-site PA system and appropriate alarms will be used to alert/warn and notify on-site personnel of an emergency and necessary protective actions as described in OPEP-02.1.1, Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency. In addition to the alarms, PEPs and security instructions provide guidance for on-site warning and notification. 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 4.4.6 for the public.

4.4.2.2 Evacuation & Personnel Accountability

For emergencies requiring protective actions in accordance with OPEP-03.8.2, Personnel Accountability and Evacuation, personnel will proceed by the safest, most direct route to the designated assembly locations or as directed by the Site Emergency Coordinator.

- a. Shift operating personnel will assemble in the Control Room.
- b. All personnel not specifically involved in responding to the emergency (non-essential) will assemble as directed.
- c. All visitors will report to the Security Office at the protected area central access control point.

A personnel accountability check will be carried out in accordance with OPEP-03.8.2, Personnel Accountability and Evacuation, 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 OPEP-03.9.2, First Aid and Medical Care, and OPEP-03.9.3, Transport of Contaminated Injured Personnel.

Search for missing persons and rescue will be performed as described in OPEP-03.9.6, Search and Rescue.

On-site personnel will evacuate the area when directed using transportation that was employed to arrive at the site. Personnel without transportation will be identified during the assembly phase and provided transportation.

The secondary access road and the main plant access road will be used to depart from the site as advised, and evacuation from the 10-mile EPZ will be by way of evacuation routes identified in Figures 1.1-1, 1.1-2, and 4.4-1.

4.4.3 Control of Personnel Radiation Exposures

Although an emergency situation transcends the normal requirements for limiting exposures to ionizing radiation, guideline levels are established in OPEP-03.7.7, Onsite Radiological Controls, for exposures that may be acceptable in emergencies. The maximum whole body (TEDE) dose received by any worker should not exceed established regulatory limits. Every reasonable effort will be used to ensure that an emergency is handled in such a manner that no worker exceeds these limits.

The administration of radioprotective drugs such as potassium iodide (KI) to Progress Energy personnel may also be useful in mitigating the consequences of inhalation of radioactive materials such as radioiodines during an emergency.

Procedures for the administration of radioprotective drugs to Progress Energy and vendor employees are described in OPEP-03.7.6, Emergency Exposure Controls.

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 exposure effects are:

1. Up to 50 Rem EDE in 1 day - no physiological changes are likely to be observed.
2. 50 to 100 Rem EDE - no impairment likely but some physiological changes, including possible temporary blood changes, may occur. Medical observations would be required after exposure.
3. 100 to 300 Rem EDE - some physical impairment possible. Some lethal exposures possible.

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

4.4.3.1 Exposure Control Under Emergency Conditions

Dose limit guidelines for workers in an emergency are taken from EPA 400-R-92-001, Manual of Protective Actions and Protective Action Guidelines for Nuclear Incidents, U. S. Environmental Protection Agency, May 1992. Much of the discussion in this section is taken in whole from that document.

In emergency situations, workers may receive exposure under a variety of circumstances in order to assure protection of others and of valuable property. These exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected.

The Emergency Worker Dose Limit Guidelines are as follows:

Dose Limit (Rem TEDE) ¹	<u>Activity</u>	<u>Condition</u>
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

Routine dose limits shall not be extended to emergency dose limits for declared pregnant individuals. As in the case of normal occupational exposure, doses received under emergency conditions should be maintained as low as reasonably achievable.

¹Doses 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.

In the context of these guidelines, exposure of workers that is incurred for the protection of large populations may be considered justified for situations in which the collective dose avoided by the emergency operation is significantly larger than that incurred by the workers involved.

Persons undertaking any emergency operation in which the dose will exceed 25 Rem TEDE should do so only on a voluntary basis and with full awareness of the risks involved, including the numerical levels of dose at which acute effects of radiation will be incurred and numerical estimates of the risk of delayed effect.

4.4.3.2 Exposures During Repair/Reentry Efforts

Each emergency worker entering a high radiation area shall wear 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 Health Physics Technician, 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 communicate with the OSC Mission Coordinator 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.

4.4.4 Radioactive Contamination

4.4.4.1 On-Site Personnel

Radiation safety controls are established to contain the spread of loose surface radioactive contamination. Personnel leaving the contaminated areas are monitored to ensure that they or their clothing are not radioactively contaminated. Additionally, in the event of a site evacuation, no personnel will be allowed to leave the plant site until they have been checked for contamination. In addition to the decontamination area of the Service Building, additional areas can be set up inside the entrance to the TSC/EOF Building.

Contaminated clothing or personal articles will be decontaminated. 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 E&RC procedures. If normal decontamination procedures do not reduce contamination to acceptable levels, the case will be referred to a competent medical authority.

4.4.4.2 Equipment and Vehicles

Equipment and tools will be released for use outside of the contaminated areas only if loose surface radioactive contamination is within acceptable 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, vehicles will be surveyed for contamination before they are allowed to leave the plant site. Contaminated vehicles will be decontaminated before being released. If the Low Level Radwaste Warehouse is not a suitable decontamination site due to radiological concerns, vehicles will be directed to an alternate area for decontamination. Brunswick County Emergency Management may provide assistance in this area.

4.4.5 Treatment of Injured and Contaminated Persons

Personnel showers and chemical decontamination agents are available on site and, except in cases of life-threatening/serious injury, established decontamination procedures will be employed on site prior to medical treatment. Decontamination showers and supplies are provided in the Service Building. Shower and sink drains in the Service Building are routed to the miscellaneous waste processing system where the liquid is processed and monitored prior to discharge.

Arrangements and facilities for medical treatment of injured plant personnel are described in detail in Appendix E - Medical Treatment and Assistance and in OPEP-03.9.2, 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 (see OPEP-03.9.3, Transport of Contaminated Injured Personnel).

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.

Definitive medical treatment, therapy, and evaluation may include radioprotective drugs, urinary bio-assays 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.

4.4.6 Public Warning and Notification

In the event of an emergency, the plant will notify designated emergency officials in Brunswick and New Hanover counties as well as state and federal officials in accordance with OPEP-02.6.21, Emergency Communicator.

During the ALERT phase of an emergency, the appropriate county and state emergency group leaders will be requested to remain in a readiness condition to alert the population at risk if needed. 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 in the North Carolina Emergency Response Plan In Support of the BNP. Warning will be given by such methods as sirens supplemented by radio, television, sound trucks, bullhorns, and knocking on doors. The Coast Guard will be used in notifying people along the coast and other large bodies of water where appropriate and necessary.

Sirens mounted on utility poles have been installed by Progress Energy at 36 locations within a 10-mile radius of the Brunswick Nuclear Power Plant. Since the average ambient noise level throughout the EPZ is about 49dBA, the siren system is planned to provide a 59dBA minimum signal. The warning signal will be a 3-to-5-minute steady tone on the sirens.

Sirens will not be sited in the Sunny Point Army Terminal. Brunswick County will notify the terminal which will alert its personnel using on-site warning methods.

Sirens will not be sited in areas of no population. Large areas of Brunswick County consist of swamps and forests with no population. These areas include such tracts as the Orton Plantation, the western section of Boiling Springs Lakes, and some areas south of Route 211. These tracts are often owned by a few local individuals or lumber companies. Based on land use history, they show little promise of development. However, the warning system will be reviewed annually and upgraded when conditions warrant.

Activation of the sirens will be accomplished from the Brunswick and New Hanover Counties Emergency Operation Centers. The sirens in each county are independently controlled, but may be activated by Progress Energy with permission from the counties. A feedback system immediately alerts Progress Energy and both counties of any siren failure. The U.S. Coast Guard will perform the warning of people on bodies of water under their jurisdiction.

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 Brunswick Nuclear Power Plant Evacuation Time Estimates For The Plume Exposure Pathway Emergency Planning Zone, prepared by PBS&J, November 2002. The total resident population affected within the 10-mile EPZ is approximately 26,724. During the summer months, June through August, the daytime population of the EPZ is approximately 147,054 (see Figure 1.1-6). The population is concentrated along the coast and a relatively few inland roads.

4.4.7 Protective Actions - Off Site/Public

4.4.7.1 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.

This will be accomplished by: (1) distribution of the annual safety information brochure which contains educational information on emergency preparedness, sheltering, sirens, radiation, and 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 safety information brochures to commercial establishments in the 10-mile EPZ.

During an actual emergency, provisions will be established through the Joint Information Center to make available and distribute information to the news media. The Joint Information Center will also 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 6.1.4.

4.4.7.2 General

For emergencies requiring protective actions for the general public in designated off-site 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 will be compared to the protective action guidelines.

The protective actions that Progress Energy recommends to the state will be based upon current meteorological data such as wind direction, speed and stability class, and other factors.

Releases affecting off-site areas may not be of the magnitude requiring evacuation, areas within the 10-mile EPZ that do not evacuate will be recommended to shelter.

Detailed procedures for public protective actions are contained in the North Carolina Emergency Response Plan in Support of BNP.

4.4.7.3 Evacuation

In the event that evacuation of the 10-mile EPZ is required, the evacuation routes shown in Figure 1.1-2 and Figure 4.4-1 will be used by on-site and off-site 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 Figure 4.4-1 and on other factors as shown in Table 4.4-1.

It should be noted that the evacuation process in itself involves risk to the public. Risks resulting from evacuation are discussed in US EPA Report, EPA 400-R-92-00, Appendix C.

4.4.7.4 Shelter

All sectors that are not recommended to evacuate will be recommended to shelter. The state may consider sheltering for special populations or hazardous environmental conditions. Special populations may include institutionalized or infirm persons. Hazardous environmental conditions may include the presence of severe weather or competing disasters.

The local housing consists primarily of wood framed dwellings, 1 and 2 stories, that are over 10 years old. Very few houses have basements. There are a number of brick veneer dwellings of later construction and a fairly small even distribution of house trailers.

The term Protection Factor (PF) refers to a number used to express the relationship between the amount of gamma radiation that would be received by an unprotected person and the amount that would be received by a person in shelter. An occupant of a shelter with a PF of 40 would be exposed to 1/40 (2.5 percent) of the dose or dose rate to which he would be exposed if his location were unprotected (Sheltered Dose = Unsheltered Dose ÷ PF).

Protection factors for various shielding materials are given in Figure 4.4-3 and for various structures and vehicles in Tables 4.4-2, 4.4-3, and 4.4-4.

4.4.7.5 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 4.4-1

FACTORS RELATED TO WARNING/EVACUATION TIME

1. Facility to Off-site 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 I
 - b. Shutting off utilities I
 - c. Packing bags I
 - d. Deciding on destination and routes I
 - e. Taking care of livestock, etc. I
 - f. Collecting other family members I
 - g. Loading the automobile and departing I
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 4.4-2
REPRESENTATIVE SHIELDING FACTORS FOR SURFACE DEPOSITED
RADIONUCLIDES*

Structure or Location	Representative Shielding Factor ^(a)	Representative Range
1 m above ordinary ground	0.70	0.47-0.85
Cars on 50-ft. road:		
Road fully contaminated	0.5	0.4-0.7
Road 50% decontaminated	0.5	0.4-0.6
Road fully decontaminated	0.25	0.2-0.5
Trains	0.40	0.3-0.5
One- and two-story wood-frame house (no basement)	0.4 ^(b)	0.2-0.5
One- and two-story block and brick house (no basement)	0.2 ^(b)	0.04-0.40
House basement, one or two walls fully exposed:	0.1 ^(b)	0.03-0.15
One story, less than 2 ft of basement, walls exposed	0.05 ^(b)	0.03-0.07
Two stories, less than 2 ft. of basement, walls exposed	0.03 ^(b)	0.02-0.05
Three- or four-story structures, 5000 to 10,000 ft ² per floor:		
First and second floors	0.05 ^(b)	0.01-0.08
Basement	0.01 ^(b)	0.001-0.07
Multistory structures, > 10,000 ft ² per floor:		
Upper floors	0.01 ^(b)	0.001-0.02
Basement	0.005 ^(b)	0.001-0.015

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

(b) Away from doors and windows.

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

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

TABLE 4.4-3
REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE

Structure or Location	Shielding 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.

(c) 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 4.4-4
PF OF VARIOUS VEHICLES AND STRUCTURES

	<u>Average PF</u>
<u>Aircraft</u> Light (Cessna - 172 type)	1.25
<u>Bus</u> - Scenic Cruiser	7
" - Commercial Type	1.7
" - School	1.6
<u>Car</u> - Passenger	1.6
<u>Foxhole</u> (3 ft. diameter x 4 ft. deep)	10.0
If an area 3 or 4 feet wide around the foxhole is kept free of fallout material, a protection factor of 100 or more is possible.	
<u>House</u> , Wood Frame (Cape Cod/Colonial Types)	
First Floor Center of House	2.0
Basement	10.0
Corner of Basement, Under Table with 8"	100.0
Concrete on top	100.0
<u>House</u> , Brick (Cape Cod/Colonial Type)	
First Floor Center of House	10.0
Basement	30.0
<u>Locomotive</u> , Heavy, Engineers Seat	3.3
<u>Normal Living</u> , Home and Work as Usual	2.0
<u>Trucks</u>	
1/4 Ton	1.3
3/4 Ton	1.4
2 1/2 Ton	1.7
4 to 7 Ton	2.0
Fire Truck, Drivers Side	2.9
Fire Truck, Standing Area in Back	1.7
<u>Roadway Underpass</u>	2 to 5
<u>Urban Areas</u> (In Open)	1.4
<u>Woods</u>	1.25

NOTE: Protection Factor (PF) = Unshielded Dose Rate + Shielded Dose Rate. Above data pertains to deposited particulate radioactive material with gamma energy approx. 0.7 mev.

BNP EVACUATION SCHEDULE AND WARNING

EVACUATION SCHEDULE					POPULATION	
Zone	Warning Responsibility	Evacuation Routes	Evacuation Shelter	Warning time hrs/mins	Permanent	Peak Transient Seasonal
A	Southport Fire/Rescue Sunset Harbor Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	Leland Middle School	0 + 39	1,542	932
B	Southport Fire/Rescue	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School Leland Middle School	0 + 18	1,609	16,387
C	Southport Fire/Rescue	NC 133 north, SR 1472 (old US 74/76) west, SR 1455 north	Lincoln Primary School	0 + 19	787	1,335
D	Oak Island Fire/Rescue/Police Yaupon Beach Fire	NC 211 west, US 17 south, NC 130 north	West Brunswick High School	0 + 32	9,297	32,422
E	Bolivia Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437 SR 1500 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School	0 + 29	2,077	745
F	Boiling Springs Fire/Rescue Bolivia Fire	NC 87 north, US 17 north, SR 1438 (Lanvale) north, right on SR 1437	North Brunswick High School	0 + 41	3,193	1,204
G	Boiling Springs Fire/Rescue Town Creek Rescue	NC 133 north, SR 1437	North Brunswick High School	0 + 43	890	64
H	Southport Fire/Rescue	NC 133 north, SR 1472 (old US 74/76) west, SR 1455 north	Lincoln Primary School	0 + 30	818	1073
K	Carolina Beach Fire/Rescue Kure Beach Fire Federal Point Fire New Hanover County Sheriff	Dow Road, US 421 north, NC 132 north	Trask Coliseum, UNC-W Roland-Grise Jr. High School ⁵ Hoggard High School ⁵ Alderman Elementary School ⁵	0 + 30	6,511	55,517
1. Bald Head Island authorities will warn the population in the Bald Head Island development. 2. If time is critical, after zones using NC 87 and NC 133 have cleared, two traffic lanes would be directed out of Zone D with one lane using NC 87 or NC 133 north. 3. Sunny Point Army Terminal, Orton Plantation, and Old Brunswick Town/Fort Anderson authorities will warn the population within their jurisdiction. 4. If time is critical, three lanes of traffic could be directed out of Zone K on US 421 north from the point where Dow Road intersects US 421. 5. These shelters are available only on days when school is not in session.						

See also Figure 1.1-2, 10 Mile Plume Exposure EPZ.

Figure 4.4-1 Evacuation Schedule and Warning

EVACUATION TIMES - BRUNSWICK EPZ

<u>Analysis Area</u>	<u>Local Planning Zones Evacuated</u>	<u>Evacuation Time (minutes)^{a,b}</u>
1	B	115-314
2	A,B,C	160-381
3	A,B,C,D	290-662
4	A,B,C,D,E	296-670
5	A,B,C,D,E,F,G,H	340-695
6	A,B,C,E,F,G,H,K	235-749
7	A,B,C,G,H,K	235-749
8	A,B,C,H,K	235-749
9	A,B,C,K	340-749
10	A,B,C,D,E,F,G,H,K	340-749

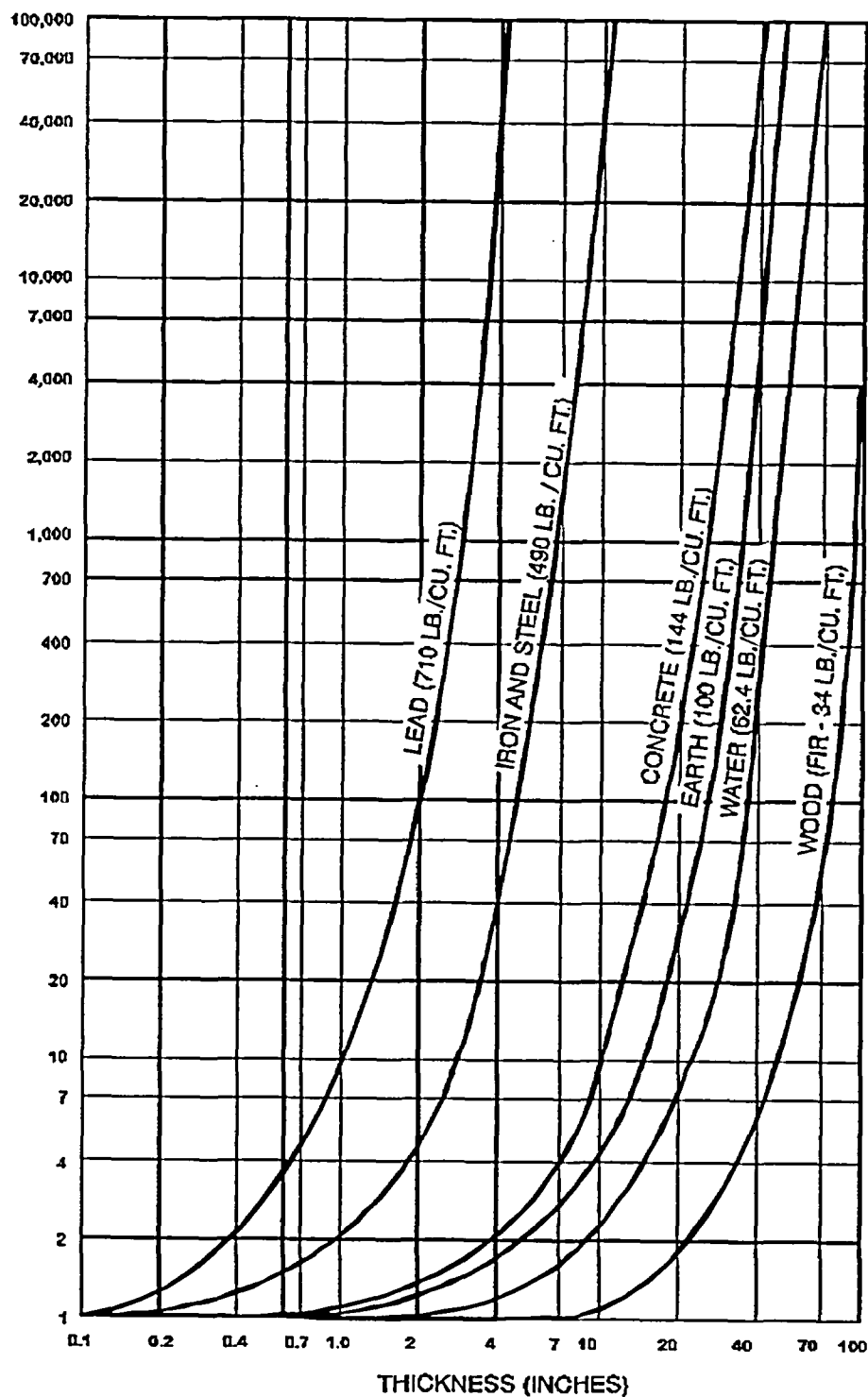
a This range of evacuation times covers four conditions:

Fair Weather - winter weekday, winter weeknight, summer weekday and summer weekend; and Adverse Weather - winter weekday and summer weekend.

b Evacuation time includes public alerting and notification (15 minutes), preparation for movement (15 minutes), and time to travel out of the local planning zone(s) being evacuated.

Figure 4.4-2 Evacuation Times

PROTECTION FACTOR



GAMMA RADIATION - 0.7 MEV
 SHELTERED DOSE = UNSHELTERED DOSE + PF

Fig. 4.4-3 Protection Factors of Shielding Materials

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

5.0 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 Brunswick. 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, fiber optic, Progress Energy microwave net, data links, and radio to provide: (a) voice communication through normal telephone use, automatic ringdown between selected facilities, conference call capability, speaker phones and operator assistance where required; (b) radio communications between selected Progress Energy vehicles and appropriate fixed locations, as well as with state mobile units and fixed locations; (c) facsimile and computer local and wide area networks. (A detailed listing of the Brunswick emergency communications systems is presented as Appendix A.)

The purpose of emergency response facilities is to provide centralized locations for organized coordination and control of on-site and off-site activities during an emergency. Each emergency response organization must assure that a location is provided from where they may direct the activities for which they are responsible, while providing for coordination of activities with other organizations.

Facilities are needed to function as a center for the licensee's command and control functions of on-site operations, including coordination of all licensee activities, on site and off site. Also needed is a center for the analysis of plant effluent monitors, meteorological conditions, and off-site radiation measurements, and for off-site dose projections. As discussed in Section 3 additional facilities are needed where information regarding current and projected plant status needed by federal, state, and local authorities for implementation of off-site emergency plans can be transmitted, where key representatives of the agencies can meet and where the press can operate.

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 Joint Information Center, and the State and Local Emergency Operations Centers. These centers are connected with a comprehensive, redundant communications network.

In the emergency facilities, decisions and responses are based upon approved procedures and controlled drawings. Uncontrolled drawings and other documents may be used for reference if identified with "FOR INFORMATION ONLY" or "FOR TRAINING USE ONLY." Material identified as "FOR INFORMATION ONLY" or "FOR TRAINING USE ONLY" will not be used in place of approved procedures or controlled drawings.

The functional capabilities of the Brunswick emergency facilities are presented in Table 5.0-2, and the physical locations of on-site emergency facilities are shown on Figure 1.1-3. Specific information about the facilities and equipment available for dealing with emergencies at Brunswick is presented in the following sections.

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 Brunswick 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 reactors and turbine generators under normal and emergency situations.

Additional equipment such as portable radiation survey instruments, readout of meteorological instrumentation and communication equipment is 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.

5.2 TECHNICAL SUPPORT CENTER

The Technical Support Center (TSC) provides a location to house personnel who are responsible for management and technical support of plant operations during emergency conditions. The TSC also functions to relieve the Control Operators of peripheral duties and communications not directly related to reactor system manipulations and preventing congestion in the Control Room. In the event of a loss of power, an auxiliary diesel generator is located near the building to supply an alternate source of power.

The TSC will be activated for an alert or higher classification. Activation for an unusual event is optional.

If it should become necessary to expedite travel between the TSC and Control Room, Security has provisions in place to provide direct access between the TSC and the protected area.

The TSC and EOF share a common building which has been designed to have the same habitability as the Control Room. The north wall is 18 inches thick and the other walls and roof are 14 inches thick. The ventilation system is described in Section 5.2.1.

5.2.1 TSC/EOF EMERGENCY VENTILATION SYSTEM

The EOF/TSC Building Ventilation System is equipped with two (2) filter systems (containing both HEPA and charcoal filters), one for each of the two ventilation intake locations (Mechanical Rooms 134 and 165). The TSC/EOF Building Ventilation System is equipped with two intake air monitors which are Eberline SRM-100 monitors with SPA-8 probes. The probes are installed in the intake air ducts where detection of a high level of radiation can automatically trigger the HVAC system to actuate emergency fans to direct intake air through the filter trains.

The intake air radiation monitors are provided with an audible local alarm that is located on the radiation monitor. When the alarm setpoint is reached, the monitor will energize its associated radiation monitor relay, which will automatically activate an emergency fan to redirect the intake air through the associated filtering system.

5.2.2 TSC/EOF EMERGENCY CONTAMINATED DRAIN SYSTEM

During an emergency, contaminated drainage could occur at the decontamination shower. An emergency drain system is provided to isolate potential contaminated drainage which can be collected in a 1,000 gallon holding tank. For normal operating conditions, all drainage would be collected by the sanitary drain lines. The holding tank is located underground on the west side of the building. Manually operated valves allow the rerouting of potentially contaminated liquid to the 1,000 gallon holding tank.

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 plant maintenance, operations, E&RC, and other plant emergency support personnel will assemble and stand by to assist as needed. The Operational Support Center is located in the O&M Building.

When the OSC is activated, dosimetry, respiratory protection, radiation survey equipment, and RWPs will be provided. In the event of a personnel contamination, decontamination will be performed in the area normally designated for this purpose. In the event the OSC is evacuated, a backup can also be provided in the Simulator. The Simulator is within the habitability envelope of the TSC/EOF.

5.4 EMERGENCY OPERATIONS FACILITY

The Emergency Operations Facility (EOF), located on site provides space for management of overall emergency response including coordination with federal, state, and local officials, coordination of off-site radiological and environmental assessment, and determination of recommended public protective actions. The EOF is activated at an alert or higher level. The EOF is in the same habitability envelope as the TSC.

If radiological conditions prevent EOF personnel from traveling to the EOF for activation, the Brunswick County Complex in Bolivia, N.C. will serve as a meeting place for personnel until radiological conditions permit travel to the facility. The Brunswick County Complex may also be used as an alternate reporting location for TSC, OSC, and EOF personnel in the event of a security threat, and function as an alternate EOF, until safe movement of personnel to the plant is assured.

5.5 JOINT INFORMATION CENTER

The Joint Information Center (JIC), located in the Brunswick Community College Complex near Bolivia, N.C., will serve as the primary location for the accumulation of accurate and current information regarding emergency conditions, and dissemination of information to news media and the general public. The JIC Communications Network has back-up capability for telephone and radio functions. Work stations are provided for Company personnel and a media briefing room is available. Telephones are provided for use by news media personnel. The center also contains work space and phones for public information personnel from the state, counties, NRC and industry-related organizations. Additional information can be found in OPEP-02.6.29, Activation and Operation of the Joint Information Center (JIC).

5.6 OFF-SITE EMERGENCY FACILITIES

5.6.1 North Carolina Emergency Operations Center

The North Carolina Emergency Operations Center (EOC) is located in Raleigh, North Carolina. When necessary, it will be activated and staffed to assist in coordinating emergency operations in support of the Brunswick Nuclear Plant.

5.6.2 Brunswick County Emergency Operations Center

The Brunswick County Emergency Operations Center is located in the Brunswick County Administration Complex in Bolivia, North Carolina, about fifteen miles from the Brunswick site. It provides a location where Brunswick County authorities can direct off-site activities in Brunswick County. If radiological conditions prevent EOF personnel from traveling to the EOF for activation, the Brunswick County Complex in Bolivia, N.C. will serve as a meeting place for personnel until radiological conditions permit travel to the facility. This facility presently has direct communications links with the Brunswick Nuclear Plant TSC and EOF, and will allow free interchange of information between government officials and those persons located in the TSC and EOF responsible for dose projection and management decision making. The Brunswick County Complex may also be used as an alternate reporting location for TSC, OSC, and EOF personnel in the event of a security threat, and function as an alternate EOF, until safe movement of personnel to the plant is assured.

5.6.3 New Hanover County Emergency Operations Center

The New Hanover County Emergency Operations Center is located in the New Hanover County Law Enforcement Center in Wilmington, North Carolina, about 20 miles from the Brunswick site. It provides a location where New Hanover County authorities can direct off-site activities in New Hanover County. This facility presently has direct communications links with the Brunswick Nuclear Plant TSC and EOF, and will allow free interchange of information between government officials and those persons located in the TSC and EOF responsible for dose projection and management decision making.

5.7 ASSESSMENT CAPABILITIES

5.7.1 General

The instrumentation and control systems monitor, provide indication and recording, and 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 at locations convenient to the operator. This instrumentation, in conjunction with projected off-site doses, provides the basis for initiation of protective actions.

5.7.2 Meteorological Instrumentation and Procedures

The Brunswick Nuclear Plant 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 system. The meteorological parameters measured on the tower at the 10-meter and 100-meter levels above ground are listed in Table 5.7-1. In addition, barometric pressure, solar radiation, precipitation and dew point temperature data are recorded at the station to provide supplemental information on local meteorological conditions. This information is remotely interrogatable using a computer or other data access terminal.

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The meteorological sensors used at the BNP meteorological monitoring station are calibrated at least twice during an annual calendar year (approximately six months between calibrations). Meteorological sensors which are removed from service are replaced with a recalibrated unit having met original equipment manufacturer specifications. Between calibrations, an electronic verification of system performance will be made and, if necessary, adjustments to the system will be performed. This electronic verification shall be performed at least once between calibrations. BNP 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 a meteorological service provider, where the data is reviewed by the meteorological staff to determine system performance and the acceptability of the reported information. Historical records and data will be maintained with the Environmental Unit for effluent reporting.

The meteorological instrumentation which Progress Energy uses at the BNP meteorological monitoring station meets the requirements of NRC Regulatory Guide 1.23 (Rev. 0) and provides the meteorological parameters to the locations specified within NRC Regulatory Guide 1.97 (Rev. 2), Table 1 and Table 2. As specified within Section 8.2 of the Supplement Number 1 to NUREG-0737, Progress Energy maintains telephone numbers for voice communications to the nearest National Weather Service, first order observation station (Wilmington, NC) for twenty-four hour per day access to this backup meteorological information should the on-site system fail. This backup source of meteorological data is the closest location which can provide reliable representative meteorological information for the BNP site.

Should the on-site meteorological data collection system exhibit suspect information, loss of data due to computer or instrument failure, or plant personnel require additional technical assistance, meteorologists are available to provide needed expertise. Meteorologists can independently access on-site meteorological data, contact the National Weather Service to obtain additional synoptic scale weather data and compile a site specific atmospheric diffusion assessment for BNP site.

5.7.3 Seismic Monitoring

The Brunswick Seismic Monitoring System senses and records earthquake ground motion received in two areas of the Reactor Building.

The system is comprised of the following components:

1. Two peak shock recorders - remote sensing devices.
2. One multichannel accelograph - Model SMA-3.
3. One magnetic tape play-back unit - Model SMP-1.

The peak shock recorders measure and record the acceleration of the structure, primarily the concrete floors adjacent to the Reactor Building equipment drain tank and at the refueling elevation. Earthquakes produce low frequency accelerations which, when detected by the remote sensing devices, will be recorded at the remote location as well as by the accelograph located in the electronic equipment room. The Seismic Monitoring System remains in a standby condition until an earthquake causes the remote unit(s) to activate the recording circuits and tape transports.

The peak shock recorder senses and permanently records the information defining a response spectrum. It also provides signals for immediate remote indication that specific preset response accelerations have been exceeded.

A considerable array of seismometers is located in the region. A central point of contact to obtain information about a seismic event is the National Earthquake Information Center in Golden, Colorado.

5.7.4 Radiological Monitors

The radiation monitoring system 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 four subsystems:

1. Process radiation monitoring system monitors various fluid streams in operating systems.
2. Area radiation monitors that monitor radiation levels at various locations within the operating area that can be read in the Control Room.
3. Continuous air monitors measure airborne particulate and/or airborne iodine activities at various locations within the operating areas.
4. Radiation monitoring equipment with readouts in various plant locations and the HP office.

The types, ranges, and locations of monitors are listed in Tables 5.7-2 to 5.7-4. Typical portable radiation monitors are listed in Table 5.7-4. The radiation monitors are designed to permit monitoring of activity releases during a broad spectrum of postulated emergency situations.

The locations of the off-site and on-site environmental monitoring stations, and the location of the emergency TLD monitoring stations are contained in plant Environmental and Radiation Control Procedures.

5.7.5 Process Monitors

Instrumentation used to monitor vital plant parameters is described in Section 7 of the Brunswick FSAR. This instrumentation is continuously monitored in the Control Room. Essential process monitoring (Critical Plant Variables) will also be available in the Technical Support Center.

5.7.6 Laboratory Facilities

Support of the radiation monitoring and analysis effort is provided by an on-site laboratory. The on-site 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 (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 Brunswick samples can be provided by laboratory facilities at the Harris Nuclear Plant, including the Harris Energy and Environmental Center (HEEC) located near New Hill, North Carolina, and by the Robinson Nuclear Plant located in Hartsville, South Carolina.

As described in the State of North Carolina Radiological Emergency Response Plan, the Division of Radiation Protection maintains a mobile radiological laboratory.

The NRC mobile laboratory may be made available for site and general emergencies. Parking space for the mobile laboratory is reserved on the southeast corner of the fabrication shop (old firehouse). The building is located on the north side of the plant, west of the Rad Material Container Storage Building. A 120 VAC receptacle box is mounted on the east exterior wall and is reserved for the mobile laboratory. The Radiological Control Director shall coordinate setting up of the mobile laboratory.

5.7.7 Dose Projection

The magnitude of releases of radioactive material can be determined from effluent and process monitors based on OPEP-03.4.7, Automation of Off-Site Dose Projection Procedures. Additionally, an independent confirmation of the magnitude of a release can be obtained by environmental monitoring as described in OPEP-02.6.6, Environmental Monitoring Team Leader and OPEP-03.5.5, Environmental Monitoring and Plume Tracking. Given a source term, or the duration and rate of release to the environment, and meteorological data previously described, the Control Room can make the initial dose projections and is capable of performing this function on a 24-hour-per-day basis. After activation of the EOF, the Radiological Control Manager described in Section 3.5.4 is responsible to the Emergency Response Manager for determining dose projections from readily available data. OPEP-03.4.7, Automation of Dose Projection Procedures, describe computer programs which automate dose projection calculations when used in conjunction with the BNP meteorological systems.

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 annunciator panels. A fire signal initiated by a detector flows through a control panel unit to an annunciator panel. The control panel unit is located in the same building as the detector. The annunciator panel is located in the 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. SD-41 provides a description of detector types, numbers, and locations.

5.9 PROTECTIVE FACILITIES AND EQUIPMENT

OPEP-04.6, Radiological Emergency Kit Inventories, lists emergency equipment that is available for the various Brunswick emergency facilities.

Complete personnel decontamination facilities are included in the Service Building. These facilities include two decontamination showers. Alternate means for decontamination are also available.

5.10 FIRST AID AND MEDICAL FACILITIES

First Aid is located on the first floor of the O&M Building. First aid kits and supplies are also placed at various locations throughout the plant.

Off-site medical facilities which have agreed to accept personnel are described in Appendix E, Medical Treatment and Assistance.

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 insure 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 stockroom and the maintenance shops.

5.12 OFF-SITE ENVIRONMENTAL MONITORING EQUIPMENT AND SUPPLIES

In the event of an emergency, the plant has the capability to deploy two off-site environmental monitoring teams as described in OPEP-02.6.6, Environmental Monitoring Team Leader. Two environmental monitoring kits with the necessary equipment and supplies for off-site radiological monitoring are designated for use in the event of an emergency. Transportation for off-site environmental monitoring teams will be supplied by plant vehicles and other Company trucks as available or private autos at the site.

TABLE 5.0-2

FUNCTIONAL OBJECTIVES OF EMERGENCY FACILITIES

<u>Facility Name</u>	<u>Location</u>	<u>Functional Objectives</u>
Technical Support Center (TSC)	Brunswick TSC/EOF/Training Building	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)	Brunswick Operations and Maintenance Building	1) Reporting place for emergency support personnel. 2) Dispatching location of personnel to support actions as directed by the Site Emergency Coordinator.
Joint Information Center	Located in Brunswick Community College Complex, Bolivia, NC	1) Provide immediate access to accurate emergency related information generated by all involved agencies by media representatives. 2) Provide equipment for document reproduction, telecopying, communications, and television electrical connections.
Emergency Operations Facility (EOF)	Brunswick TSC/EOF/Training Building	1) Provide working space and communication links for the Emergency Response Manager and his staff. 2) Provide primary interface point for Progress Energy and off-site support personnel (Federal and State). 3) Provide point of coordination for off-site radiological and environmental assessment.
New Hanover County Emergency Operations Center (EOC)	Wilmington, North Carolina	1) Direction and coordination of New Hanover County emergency and protective response actions.
Brunswick County Emergency Operations Center (EOC)	Bolivia, North Carolina	1) Direction and coordination of Brunswick County emergency and protective response actions.
North Carolina State Emergency Operations Center (EOC)	Raleigh, North Carolina	1) Direction and coordination of Brunswick and New Hanover County emergency and protective response actions.

TABLE 5.7-1

ON-SITE METEOROLOGICAL INSTRUMENTATION

<u>Approximate Height Above Tower Base (ft)</u>	<u>Recorded Parameter</u>	<u>Instrument</u>
344	Windspeed, direction and direction variance	Threshold less than 1 mph.
35	Windspeed, direction, and direction variance	Threshold less than 1 mph.
344	Temperature difference relative to 35 ft elevation	Resistance thermobulb in aspirated radiation shield at 344 and 35 ft elevation.
35	Ambient temperature	Resistance thermobulb in aspirated radiation shield at 35 ft elevation.

TABLE 5.7-2
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
1-1	0.01 - 100	Control Room Operating Area	Control
1-2	0.01 - 100	U-2 Electronic Equipment Room *	Control
1-3	0.01 - 100	U-1 Electronic Equipment Room *	Control
1-4	0.01 - 100	Stack Filter House	Stack
1-5	0.01 - 100	Service Bldg. Radiochemical Lab.	Service
1-6	0.01 - 100	Service Bldg. Personnel Decon Equipment Room	Service
1-7	0.1 - 10 ³	Hot Machine Shop	Service
1-8	0.01 - 100	Service Bldg. Equipment Room East/West Corridor	Service
1-9	0.01 - 100	U-1 Turb. Hall Control Access Corridor	Turbine
1-10	0.01 - 100	U-1 FW Heater Bay Access Corridor	Turbine
1-11	0.01 - 100	U-1 Turb. Bldg. Sampling Station	Turbine
1-14	0.1 - 10 ³	U-1 Turb. Rotor Washdown Area	Turbine
1-15	0.1 - 10 ³	1A Core Spray Pump Room ESS I	Reactor
1-16	0.1 - 10 ³	1B Core Spray Pump Room ESS II	Reactor

- Detectors are located in mechanical equipment room (Control Building ventilation air intake plenum)

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
1-17	0.1 - 10 ³	1A RHR System Hx and Pump Room ESS I	Reactor
1-18	0.1 - 10 ³	1B RHR System HX and Pump Room ESS II	Reactor
1-19	0.01 - 100	U-1 Rx Bldg. Airlock Area EL 20 ft.	Reactor
1-20	0.01 - 100	U-1 Drywell Entrance	Reactor
1-21	1.0 - 10 ⁴	U-1 TIP Room	Reactor
1-22	0.01 - 100	U-1 Decontam. Room EL 20 ft.	Reactor
1-23	0.01 - 100	U-1 Equipment Entry EL 20 ft.	Reactor
1-24	0.01 - 100	U-1 Rx Bldg. Sampling Station	Reactor
1-25	0.01 - 100	U-1 Rx Bldg. Air Lock EL 50', 8"	Reactor
1-26	0.01 - 100	U-1 New Fuel Vault EL 98', 9"	Reactor
1-27	0.01 - 100	U-1 North of Fuel Storage Pool	Reactor
1-28	10 ² - 10 ⁶	U-1 Between Rx and Fuel Pool EL 117 ft., 4 in.	Reactor
1-29	0.01 - 100	U-1 Cask Wash Area Refuel Floor	Reactor
1-30	0.01 - 100	U-1 Spent Fuel Pool Cooling System	Reactor

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
2-1	0.1 - 10 ³	Radwaste Bldg. EL 3 ft. N MCC and Sump Area	Radwaste
2-2	0.1 - 10 ³	Radwaste Bldg. EL 3 ft. S MCC and Sump Area	Radwaste
2-3	0.1 - 10 ³	U-2 Cond Filter - Demin Aisle	Radwaste
2-4	0.1 - 10 ³	U-1 Cond Filter - Demin Aisle	Radwaste
2-5	0.01 - 100	Radwaste Control Room	Radwaste
2-6	0.01 - 100	Radwaste Sampling Station	Radwaste
2-7	0.01 - 100	Radwaste Drum Capping Station	Radwaste
2-8	1.0 - 10 ⁴	Radwaste Drum Storage	Radwaste
2-9	0.01 - 100	U-2 Turb. Hall Access Corridor	Turbine
2-10	0.01 - 100	U-2 FW Heater Bay Access Corridor	Turbine
2-11	0.01 - 100	U-2 Turb. Bldg. Sampling Station	Turbine
2-14	0.1 - 10 ³	U-2 Turb. Rotor Washdown Area	Turbine
2-15	0.1 - 10 ³	2A Core Spray Pump Room ESS I	Reactor
2-16	0.1 - 10 ³	2B Core Spray Pump Room ESS II	Reactor

TABLE 5.7-2 (Cont'd)
AREA RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Range (mRem/hr)</u>	<u>Designation</u>	<u>Detector Location (Bldg.)</u>
2-17	0.1 - 10 ³	2A RHR System Hx and Pump Room ESS I	Reactor
2-18	0.1 - 10 ³	2B RHR System Hx and Pump Room ESS II	Reactor
2-19	0.01 - 100	U-2 Rx Bldg. Airlock Area EL 20 ft.	Reactor
2-20	0.01 - 100	U-2 Drywell Entrance	Reactor
2-21	1.0 - 10 ⁴	U-2 TIP Room	Reactor
2-22	0.01 - 100	U-2 Decontam. Room EL 20 ft.	Reactor
2-23	0.01 - 100	U-2 Equipment Entry EL 20 ft.	Reactor
2-24	0.01 - 100	U-2 Rx Bldg. Sampling Station	Reactor
2-25	0.01 - 100	U-2 Rx Bldg. Airlock EL 50 ft.	Reactor
2-26	0.01 - 100	U-2 Inside New Fuel Vault EL 98 ft. 8 in.	Reactor
2-27	0.01 - 100	U-2 North of Fuel Storage Pool	Reactor
2-28	10 ² - 10 ⁶	U-2 Between Rx and Fuel Pool EL 117 ft. 4 in.	Reactor
2-29	0.01 - 100	U-2 Cask Wash Area Refuel Floor	Reactor
2-30	0.01 - 100	U-2 Spent Fuel Pool Cooling System	Reactor

TABLE 5.7-3

PROCESS RADIATION MONITORING SYSTEM
CHANNEL IDENTIFICATION & METER RANGES

<u>Channel</u>	<u>Supplier</u>	<u>Range</u>
Main Steam Line Radiation Monitors Channel A (D12-RM-K603A) Channel B (D12-RM-K603B) Channel C (D12-RM-K603C) Channel D (D12-RM-K603D)	GE	1-10 ⁶ mRem/hr
Condenser Off-Gas Radiation Monitors Log Channel A (D12-RM-K601A) Log Channel B (D12-RM-K601B) Linear Channel (D12-RM-K602)	GE	1-10 ⁶ mRem/hr
Main Stack Radiation Monitors	General Atomics	10 ⁻⁷ -10 ⁵ μ Ci/cc (Xe equivalent)
Liquid Process Radiation Monitors Radwaste Effluent (D12-RM-K604) Service Water Discharge (D12-RM-K605) Reactor Bldg Closed Cooling Water (D12-RM-K606)	GE	10 ⁻¹ -10 ⁶ cps
Storm Drain Collector Basin (2-DST-RM-5361)	General Atomics	10 ¹ -10 ⁷ cpm
Reactor Bldg Ventilation Radiation Monitors Channel A (D12-RM-K609A) Channel B (D12-RM-K609B)	GE GE	0.01-100 mRem/hr
Gaseous Analyzer Radiation Monitors Reactor Building Roof Vent (CAC-AQH-1264)	NMC	10-10 ⁶ cpm
Turbine Building Vent (D12-RM-23)	General Atomics	10 ⁻⁷ -10 ⁵ μ Ci/cc (Xe equivalent)
Drywell Primary Containment Atmosphere (CAC-AQH-1260, 1262)	NMC	

TABLE 5.7-3 (Cont'd)

AOG Charcoal Adsorber System Effluent (AOG-R1-103)	General Atomics	10^1 - 10^7 cpm
Hardened Wetwell Vent	General Atomics (Sorrento)	10^{-4} - 10^5 μ Ci/cc

TABLE 5.7-4

TYPICAL PORTABLE SURVEY EQUIPMENT

<u>Type</u>	<u>Range</u>	<u>Type Of Radiation Measured</u>
Teletector	0.1 mRem/hr-1000 Rem/hr	γ
Eberline RM-14 Radiation Monitor	0 - 50,000 cpm	β, γ
Ludlum Model 177	0 - 500,000 cpm	β, γ
R07	1 mr/hr - 20,000 R/hr	β, γ
AMP-100	1 mr/hr - 1000R/hr	γ
AMP-200	100 mr/hr - 18K R/hr	γ
R02	0 - 5000 mr/hr	β, γ
R02A	0 mr/hr - 50 R/hr	β, γ
R020	0 mr/hr - 50 R/hr	β, γ
BICRON Micro Rem	0 - 200,000 μ r/hr	γ
ASP-1 With Neutron Ball	0 - 100 Rem/hr	n
Ludlum Model 12 With Neutron Ball	0 - 10 Rem/hr	n
E530N	0 mrem/hr - 20 R/hr	γ

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

6.0 MAINTAINING EMERGENCY PREPAREDNESS

Emergency preparedness at Brunswick will be maintained by (a) preparing the emergency organization members and the public for proper emergency response actions through training, drills and exercises, and public education programs (Section 6.1); (b) periodic review and update of the Brunswick Radiological Emergency Plan and its implementation procedures (Section 6.2); (c) periodic inventory and calibration of emergency equipment and instrumentation (Section 6.3); and (d) cognizance of the Plant Nuclear Safety Committee over safety-related issues (Section 6.4).

The Supervisor - Emergency Preparedness is the Emergency Planning Coordinator and is responsible for maintaining Emergency Preparedness at the Brunswick Nuclear Plant, as outlined in Section 6.1.3.

Each periodic requirement in this section and elsewhere in the plan and plant emergency procedures shall be performed within the specified time below:

- a. Annually - At least once per 366 days
- b. Monthly - At least once per 31 days
- c. Quarterly - At least once per 92 days
- d. Semiannually - At least once per 184 days

For the above intervals, a maximum allowable extension is permitted subject to the following restrictions:

- The maximum allowable extension shall not exceed 25% of the specified interval.
- The combined time interval for any three consecutive intervals shall not exceed 3.25 times the specified interval.

This definition for periodic requirements applies to all intervals in the emergency plan and plant emergency procedures except for the evaluated exercise which is conducted once every two calendar years, and off-site training which is conducted once per calendar year.

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 retraining of the emergency response organization. Significant changes in the content of this Plan and procedures which implement this Plan are distributed by memorandum to the appropriate plant groups.

6.1.1 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 assigned individuals and their alternates in their duties and responsibilities.
3. When appropriate, train on significant changes in the scope or contents of the Plan or procedures which implement the Plan.
4. Provide annual refresher training and retesting to ensure that Emergency Plan personnel are familiar with their duties and responsibilities assigned by the Plan and procedures which implement the Plan.

Each individual, other than escorted personnel, is provided with initial orientation training on the notification and instruction methods used at the Brunswick plant in the event of an emergency.

Each badged individual, other than escorted personnel, also receives initial orientation on the basic principles of radiological safety including the effects of radiation and the theory and use of radiation detection devices. Appropriate actions for escorted individuals shall be the responsibility of the escort.

The Emergency Plan Training Program described in OPEP-04.3 assures training of those individuals who may be called to respond to an emergency at the Brunswick plant by providing initial training and annual refresher training and retesting on the scope and content of the Plan and procedures which implement the Plan.

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 Staff Personnel
Security Personnel
Fire Brigade Personnel
Dose Projection Personnel
Radiological Emergency Teams
Emergency Communicators
EOF Personnel
OSC Personnel
JIC Personnel
Plant Operators
Off-site groups who may be requested to assist in an emergency.

Training of off-site organizations is described in their radiological emergency plans. Training by Progress Energy for hospital, ambulance, rescue, police, and fire personnel will include the procedures for notification, basic radiation protection, and their expected roles. For those local services support organizations who may enter the site, training by Progress Energy will also include site access procedures and the identity (by position and title) of the individual in the Brunswick organization who will control the organization's support activities. Progress Energy will assist these off-site organizations in performing their radiological emergency response training as related to the Brunswick plant.

Progress Energy, and the public information officials from the state and local governments will jointly make available an annual program to acquaint the news media with the company, state and county emergency plans and procedures. The program also includes information concerning radiation, nuclear plant operations and official points of contact for release of public information.

Severe Accident Management training and drills will be conducted in accordance with Severe Accident Management Program and Training Procedures.

6.1.2 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, off-site 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 observers.

6.1.2.1 Drills

Emergency drills are supervised instruction periods aimed at testing, developing and maintaining skills, and to ensure that adequate emergency response capabilities are maintained during the interval between evaluated exercises. Periodic drills will be conducted, in addition to the evaluated exercise as follows:

1. General: At least one drill shall be conducted during the interval between evaluated exercises involving a combination of some of the principal functional areas of the organization's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as

management and coordination of emergency response, accident assessment, protective action decision making, and plant system repair and corrective actions.

During these drills, activation of all of the emergency response facilities (Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)) is not necessary.

Participants have the opportunity to consider accident management strategies, supervised instruction is permitted, and participants have the opportunity to resolve problems (success paths) rather than have controllers intervene. The drills focus on onsite training objectives.

2. Communications Drills: A system to test the readiness of the communications network between the plant and state and county governments within the ten-mile EPZ and the NRC will be conducted monthly. Communications between the plant, federal emergency response organizations, and states within the 50-mile EPZ will be tested quarterly. Communications between the plant and state and local emergency operation centers and field assessment teams shall be conducted annually.
3. Fire Drills: Fire drills will be conducted in accordance with the Fire Protection Program.
4. Medical Emergency Drills: Medical emergency drills involving a simulated contaminated individual will be conducted annually. The actual off-site portions of these drills may be conducted once per calendar year.
5. Radiological Monitoring Drills: Radiological monitoring drills will be conducted annually. These drills will include collection of the appropriate sample media both on site and off site as the drill scenario requires.

6. 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. This may be held in conjunction with the Radiological Monitoring Drills.
7. Augmentation drills: Augmentation drills requiring travel to the site shall be conducted once every 24 months.
8. SAMG drills: Severe Accident Management Guideline table-top and/or inter-facility mini-drills will be conducted periodically and will involve a combination of some of the principal functional areas of the organization's onsite emergency response capabilities similar to that described in General drills (6.1.2.1.1) above.

The above drills will be evaluated by a drill observer (communication drills will not require an observer). The degree of participation by outside agencies in conducting these drills may vary and their action may actually be simulated. Any state or local government located within the plume exposure pathway EPZ will be allowed to participate in the drills when requested by such State or local government.

6.1.2.2 Exercises

An exercise is an event that tests the integrated capability of major response organizations. An emergency exercise will be conducted once every two calendar years and will be based on a scenario which is ultimately declared at least as a Site Area Emergency. The scenario will be varied from exercise to exercise such that all elements of the plant, county, and state plans and emergency organizations are tested within a 6-year period. Each organization should make provisions to start an exercise between 6:00 p.m. and 4:00 a.m. Every sixth year, the exercise will be expanded to allow involvement of 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.

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

1. Condition recognition and reporting
2. Assessment
3. Off-site notification, including Progress Energy off-site personnel
4. Off-site response
5. Site response coordination, including logistics, center manning, information gathering and analysis, and coordination with off-site agencies
6. Corrective actions
7. Protective actions
8. Record keeping
9. Monitoring
10. Plant operation

Qualified observers 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 Emergency Planning Coordinator, or his designee, following the critique.

Exercise controllers, observers, 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 Planning Coordinator or his designee will determine the corrective actions necessary and the schedules for performing them and will evaluate the corrective actions taken.

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.

6.1.3 Emergency Planning Coordinator

The Supervisor - Emergency Preparedness is the Brunswick Emergency Planning Coordinator. He is responsible for coordinating on-site and off-site radiological emergency response planning. Specific responsibilities include the following:

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 the evaluated exercise and the periodic drills.
4. Identifying off-site training needs of state and local emergency support personnel and arranging for training to meet the identified needs.
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. These corrective actions can be tracked by means of the Corrective Action Program.
6. Maintaining and negotiating agreements with state and county response agencies, federal assistance agencies, and medical and fire support agencies.

6.1.4 Public Education

The North Carolina Department of Crime Control and Public Safety has overall responsibility for maintaining a continuing disaster preparedness public education program. Such a program, prepared by the State of North Carolina, with the cooperation of local governments and Progress Energy, is intended to ensure that members of the public are:

- (1) Aware of the potential threat of a radiological emergency;
- (2) Able to recognize radiological emergency notification; and
- (3) Knowledgeable of the proper, immediate actions (e.g., return to home, close windows, and tune to an Emergency Alert System station) 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 concerning public education can be found in Section 4.4.7.

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.

6.2.1 Plan Updates

The Emergency Planning Coordinator is responsible for coordinating the updating of the Plan and implementing procedures. He schedules an annual review of the Plan by the Plant Nuclear Safety Committee (see Section 6.4). Any proposed changes to the Plan due to regulatory revisions, experiences of drills and exercises, or other requirements are approved by the Supervisor - Emergency Preparedness. Approved changes to the Plan will be distributed to organizations and individuals with responsibility for implementation of the Plan. Phone listings in emergency procedures shall be updated quarterly, if required.

6.2.2 Independent Review

In addition to the reviews conducted at the plant, the Nuclear Assessment Section will conduct an independent review of the Plan either:

At intervals not to exceed 12 months or,

As necessary, based on an assessment by the licensee against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness, but no longer than 12 months after the change. In any case, all elements of the emergency preparedness program must be reviewed at least once every 24 months.

The review will include an evaluation for adequacy of interfaces with State and local governments and of drills, exercises, capabilities, and procedures. The results of the review, along with recommendations for improvements, will be documented, reported to the Corporate office and plant management, and retained for a period of five years. The part of the review involving the evaluation for adequacy of interface with the State and local governments will be available to the appropriate State and local governments. Corrective actions deemed necessary from the review will be implemented similar to the description in Section 6.1.3.5 of this Plan and the site Corrective Action Program.

6.2.3 Off-Site Agreements and Plans

Emergency response plans and agreements with supporting organizations will be reviewed and certified to be current on an annual basis and updated, if necessary. Changes will be incorporated in the annual revision of the Plan.

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.

6.3.1 Emergency Equipment and Supplies

A listing of emergency equipment and supplies to be inventoried is included in OPEP-04.6. This listing provides information on location and availability of emergency equipment and supplies.

An inventory of emergency equipment and supplies is held in accordance with OPEP-04.6. During this inventory, radiation monitoring equipment is checked to verify that required calibration and location are in accordance with the inventory lists. Respiratory protection equipment, maintained for emergency purposes, is also inspected and inventoried.

6.3.2 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 Office 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.

6.4 PLANT NUCLEAR SAFETY COMMITTEE

The Plant Nuclear Safety Committee (PNSC) is a standing committee comprised of Brunswick plant 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 reviews all changes to the plant, or its documentation, that involve unreviewed safety questions. In addition, the PNSC reviews plant operations to detect any potential safety hazards. Each plant supervisor will monitor the activities within his areas of responsibility to detect unsafe practices, trends, or hazards. Also, the PNSC investigates and reports on Technical Specification violations or other situations involving safety.

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

7.0 RECOVERY

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 that recovery activities are initiated and that the Recovery Organization as shown in Figure 7.2.1 will be assembled in the EOF. All recovery actions will be preplanned in order to minimize radiation exposure or other hazards to recovery personnel. Recovery activities are classified as described in Section 7.3.

The overall goals of the recovery effort are to assess the radiological consequences of the emergency and perform cleanup and repair operations necessary to restore normal access to the affected areas or identify and restrict access to those areas that must be controlled. This effort includes marshaling of the Corporate resources and interfacing with outside agencies.

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.

- The Recovery Center at Brunswick will be established in the existing
- TSC/EOF/Training Building. Provisions have been made for expansion into the BNP Technical and Administration Center (TAC Building), if required to support an extensive recovery effort.

Activation of the recovery organization will be initiated by the Vice President - Brunswick Nuclear Plant (or his alternate) after consultation with the Plant General Manager (or his alternate). The recovery organization will then be established at Brunswick 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. A block diagram of the typical recovery organization is presented in Figure 7.2-1.

7.2.1 Recovery Manager

The Recovery Manager is the senior position responsible for all on-site activities during the recovery phase following a radiological emergency. He is also responsible for providing the primary interface with State, local and Federal agencies including the coordination of Progress Energy resources during off-site recovery efforts. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.2 Plant General Manager

The Plant General Manager is responsible to the Recovery Manager for implementation of in-plant activities during the Recovery phase with the objective of maintaining a safe shutdown condition and controlling sources of radioactivity in the plant. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

– 7.2.3 Technical Analysis Manager

The Technical Analysis Manager, is responsible to the Recovery Manager for technical support, specifically in the analysis and development of plans and procedures to support recovery activities 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 specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.4 Engineering Manager

The Engineering Manager, is responsible to the Recovery Manager for directing and administratively controlling the Progress Energy recovery organization engineering staff while providing engineering, including civil, and design support to meet requirements of the recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.5 Administrative and Logistics Manager

The Administrative and Logistics Manager, is responsible to the Recovery Manager for providing administrative, logistic, communications, and personnel support for recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.2.6 Radiological Control Manager

The Radiological Control Manager, is responsible to the Recovery Manager for providing radiation protection and waste disposal plans to support recovery activities. The specific responsibilities of this position are contained in OPEP-02.7, Recovery.

7.3 RECOVERY PLANNING

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

1. On-site recovery
2. Off-site recovery

7.4 ON-SITE RECOVERY ACTIVITIES

On-site recovery activities are performed in accordance with existing plant procedures. Radiation and contamination levels for determining the need for decontamination and for returning areas or items to normal use are included in these procedures. Additional procedures will be developed as appropriate on a case-by-case basis.

7.5 OFF-SITE RECOVERY ACTIVITIES

7.5.1 General

The Progress Energy Recovery Manager will coordinate with and assist off-site agencies in the recovery activities.

The State will be the lead organization for off-site recovery activities 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 reentry to off-site areas will be made by the senior elected official of the area concerned after consultation with the North Carolina Division of Radiation Protection.

7.5.2 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:

- a. Allow health physics teams to survey the contaminated areas,
- b. 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.
- c. Allow emergency operations of utilities and services (power, water, telephone, sewage treatment, etc.) during the cleanup operation, and
- d. 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).

- e. Stabilize the contaminated areas so that the radioactive materials are not spread to other areas or leached 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, and 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.

7.5.3 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:

- a. 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.

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

- b. 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.
- c. Diverting affected products to uses other than human consumption.
- d. Condemning food.
- e. Decontaminating farmland where practical.
- f. Converting farmland to other uses for extended periods of time when decontamination is not practical.
- g. 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.

7.5.4 Monitoring and Dose Assessment

The North Carolina Division of Radiation Protection (DRP), Department of Environment Health and Natural Resources, will be the lead agency in the collection and analysis of radiation monitoring reports and of environmental air, foliage, food, and water samples. The DRP will be assisted by qualified personnel from the BNP, and the General Electric Company Wilmington Manufacturing Division.

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

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

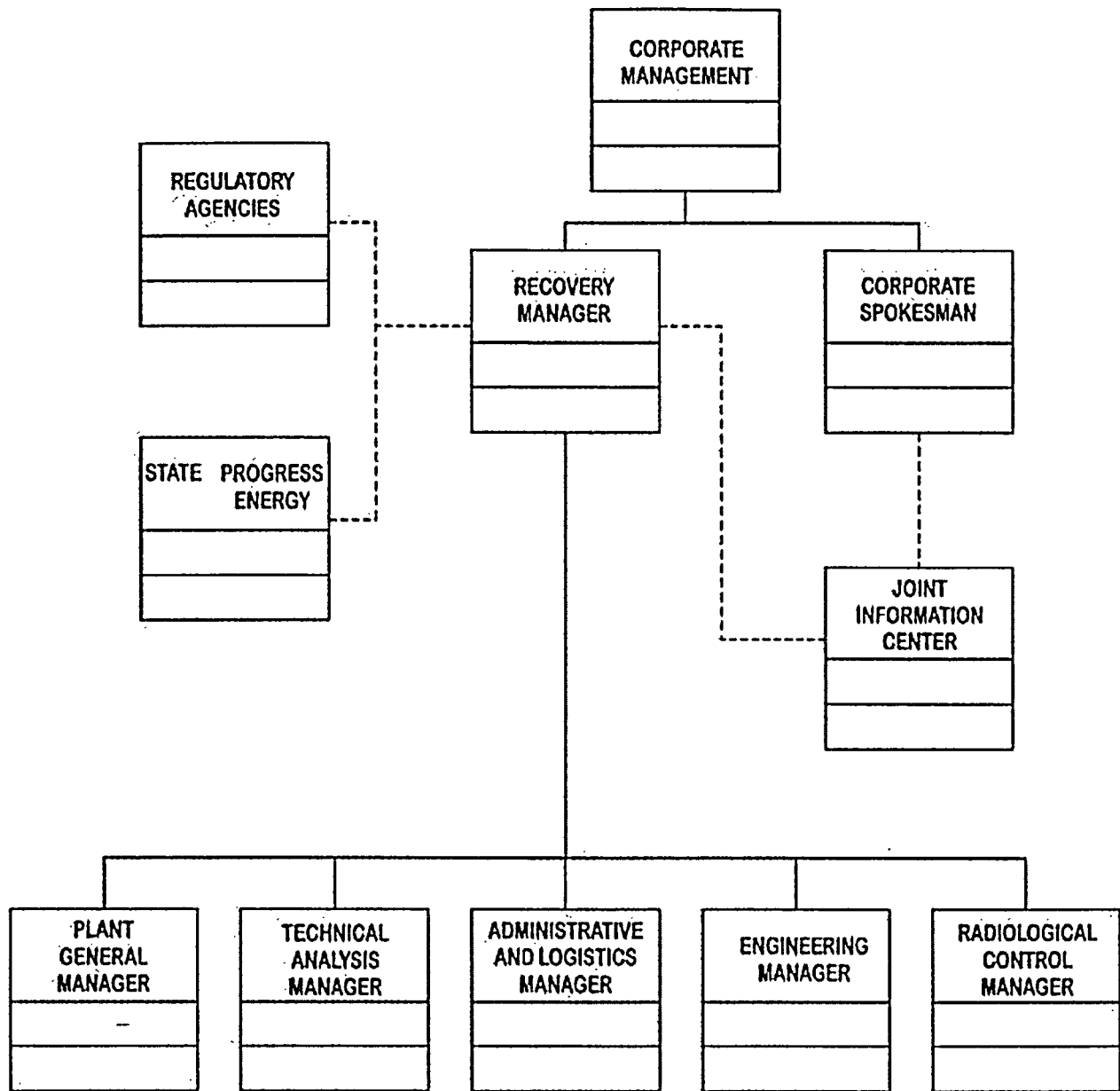


FIGURE 7.2.1 Progress Energy Recovery Organization

BRUNSWICK NUCLEAR PLANT
RADIOLOGICAL EMERGENCY PLAN

8.0 REFERENCES

1. Brunswick Steam Electric Plant Operating Manual, Carolina Power & Light Company, (date varies by volume and by entry).
2. NGGM-PM-0002, Progress Energy Radiation Control and Protection Manual.
3. Updated Final Safety Analysis Report (FSAR), Progress Energy, Brunswick Steam Electric Plant Units 1 and 2.
4. Environmental and Fallout Gamma Radiation Protection Factors Provided By Vehicles, Health Physics, 26, Pg. 41-44, 1974.
5. EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, U. S. Environmental Protection Agency, May 1992.
6. Brunswick Nuclear Power Plant Evacuation Time Estimates Update For The Plume Exposure Pathway Emergency Planning Zone, November 2002. PBS&J.
7. North Carolina Emergency Response Plan in support of the Brunswick Steam Electric Plant.
8. NUREG-0654/FEMA-REP-I, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.
9. – 1990 Census data as reported by the State of North Carolina, Office of State Planning, Center for Geographic Information and Analysis.
10. NUREG-0737, Supplement 1, Clarification of TMI Action Plan Requirements.
11. NUREG/CR-1433, Examination of the Use of Potassium Iodide (KI) as an Emergency Protective Measure for Nuclear Reactor Accidents, March 1990.

12. Title 10, Code of Federal Regulations.
 - a. Part 20, Standards for Protection Against Radiation
 - b. Part 50, Licensing of Production and Utilization Facilities
 - c. Part 50, Appendix E, Emergency Plans for Production and Utilization Facilities
 - d. Part 100, Reactor Site Criteria
13. NEI 91-04, Rev. 1, Severe Accident Issue Closure Guidelines
14. Memo, Warren Dorman to PNSC, dated August 11, 1999 Subject Operations Shift Staffing
15. Brunswick Steam Electric Plant, Units 1 and 2 - Issuance of Amendments No. 226 and 253, Elimination of Requirements for Post Accident Sampling System (Docket Nos. 50-325 and 50-324), February 11, 2003.
16. SOER 02-1, Severe Weather Rec. 3 (12/03/02)

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APPENDIX A

BRUNSWICK COMMUNICATIONS SYSTEM

A.0 INTRODUCTION

Communications systems are designed to facilitate emergency communications within the Brunswick Plant and between Brunswick and emergency facilities. Redundant means of communication are provided to locations which provide a vital emergency response role.

A.1 PLANT COMMUNICATION SYSTEMS

A.1.1 Public Address System

The Brunswick Plant 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.

A.1.2 PBX Telephone System

The Brunswick Site 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 and A.2.2.

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 Brunswick and Vicinity

VHF transceivers are used for point-to-point communications in the plant vicinity using state frequencies. Control stations are located in the TSC and EOF to talk with mobile and portable units. A primary and secondary source of power is provided for fixed base radio, with portable and mobile units powered by battery.

A.1.5 Brunswick Emergency Telephone and Radio System

The Brunswick Site emergency telephone system consists of dedicated telephone lines between emergency facilities at the Brunswick Plant through a switch which is provided with a primary and secondary source of power (ROLM 4000 series). Radio communications with mobile and portable units reserved for an emergency is possible through a repeater on a Progress Energy-assigned frequency as well as a local (UHF) short-distance frequency. A primary and secondary source of power is provided for fixed radio equipment, with mobiles and portables powered by battery.

A.1.6 Plant Security Communications

A portable radio communication system for plant use is available. Specific channel assignments are designated for security force use.

A.1.7 Emergency Response Facility Information System (ERFIS)

During an emergency, this system provides information on a Video Display Terminal simultaneously in the control room, the Technical Support Center, and the Emergency Operations Facility. The data may also be printed out in hard-copy form. Primary and secondary power sources are supplied to this system.

A.1.8 Satellite Telephone Communications

This system consists of a briefcase enclosed portable, AC, DC, or battery powered satellite link telephone. This telephone has the capability to be connected with a fixed remote antenna or use the briefcase portable antenna with access to either of two geosynchronous communication satellites.

A.2 OFF-SITE COMMUNICATIONS SYSTEMS

A.2.1 Corporate Telephone Communications System (Voicenet)

Interconnected through the site PBX and the emergency telephone system, the corporate telephone system provides a means to communicate with other corporate locations with which the plant has a need to communicate. Corporate transmission facilities provide fiber optic, copper-wire, and microwave radio to ensure a high degree of system reliability. In addition to the redundancy provided by the three system options, backup power is provided for the systems.

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A.2.2 Commercial Phone Lines

Commercial telephone lines, which supply public telephone communications, are employed by Progress Energy in three ways: (1) tie-ins through the PBX to any other plant location, (2) lines to plant emergency facilities, and (3) lines to the Joint Information Center for public information purposes. Bell South provides primary and secondary power for their lines at the Central Office.

A.2.3 Dedicated Telephone System to Load Dispatcher

This system provides direct links between the Control Room and the load dispatcher. Transmission facilities are microwave radio. 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 Brunswick as the caller. Primary and secondary power is supplied at both ends.

A.2.4 Emergency Communications Network

The Emergency Communications Network is a system, separate from other communications systems, which provides back-up dedicated telephone and radio facilities between emergency response centers. The purpose of these facilities is to ensure priority communications at any time from Brunswick Plant to emergency response personnel at the federal, state, local governments, and other Progress Energy facilities, and General Electric Company.

A.2.5 Plant Security

A plant security radio control station provides for radio communications to local law enforcement agencies (LLEA). Primary and secondary power is supplied.

A.2.6 Corporate Informational Data Communications

Large central computers are located at the Corporate headquarters. Smaller special purpose computers are located at other Corporate facilities, including the Brunswick Plant. The communications link between the Brunswick Plant and Corporate headquarters allows the interchange, storage, and processing of information.

A.2.7 NRC Emergency Telecommunications System

The NRC uses a Progress Energy dedicated telephone line which allows direct telephone communications from the plant to NRC regional and national offices. The Progress Energy communications line provides a link independent of the local public telephone network. Telephones connected to this network are located in the Brunswick Control Room, Technical Support Center, and Emergency Operations Facility. There are also telephones connected to this system for use by Health Physics personnel. Primary and secondary sources of power are supplied.

Appendix B
AGREEMENTS

NOTE: Existing agreements are included for this submittal. These agreements will be revised as required to be consistent with this revision of the Plan.

City of Southport
201 East Moore Street
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the City of Southport and Southport Fire Department's (hereafter identified as Fire Department) understanding and agreement to provide assistance in the event of an accident or emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. This agreement shall take effect on July 1, 1987. Either party may terminate this agreement at any time upon six months written notice to the other party.
2. The Fire Department shall be available to fight fires at the Brunswick Plant upon request by Progress Energy, including fires where radioactivity may be present. However, in any situation where radioactivity may be present, the BNP Shift Incident Commander shall first consult with the Chief Officer of the Southport Fire Department concerning the situation before sending any of the Fire Department into an area where radioactivity may be present. After consultation the Chief Officer of the Fire Department will comply with the Brunswick Shift Incident Commander's request and shall issue the command to his personnel with respect to his department's safety.
3. In the event that the Fire Department is unavailable to respond to Progress Energy's request due to other calls or fire fighting activities, it will incur no liability to Progress Energy for failure to respond to said call.
4. The Fire Department will be under the direction of the BNP Shift Incident Commander who shall issue commands to the personnel of the Fire Department through its Chief Officer. Should it be necessary for more than one fire company to assist in the fighting of a fire at BNP, the Fire Department will assume responsibility as the lead fire company.
5. In the event of possible radioactive contamination of the Fire Department personnel and/or equipment, qualified Progress Energy personnel will provide Fire Department personnel with appropriate monitoring or protective devices prior to engaging said personnel in a radioactive situation to ensure that the radiation level is not unreasonably dangerous.
6. In the event of a chemical fire at BNP, proper clothing will be provided by Progress Energy to Fire Department personnel prior to engagement in fire fighting.

7. Progress Energy shall provide the Fire Department personnel with all necessary instructions and training to enable the Fire Department personnel to engage in fire fighting at BNP. Fire Department personnel agree to participate in said training and in all training exercises and drills. In addition, Progress Energy shall not request Fire Department personnel to engage in fighting of a chemical fire or in a fire where radioactivity may be present prior to any additional instruction or training of Fire Department personnel necessary to qualify them to engage in such activities. Both Progress Energy and the Fire Department personnel shall cooperate with each other in arranging for the instruction and training of the Fire Department personnel necessary to qualify them to engage in such activities. Both Progress Energy and the Fire Department personnel shall cooperate with each other in arranging for instruction and training exercises.
8. Any contaminated articles belonging to the Fire Department or its personnel, including fire trucks, will be adequately decontaminated or replaced by Progress Energy at its own expense as expeditiously as possible.
9. Progress Energy shall be liable to the Fire Department personnel for any radiation injury sustained by said personnel at BNP and shall provide nuclear insurance to cover the Fire Department personnel while engaged in fire fighting at BNP.
10. Progress Energy shall retain the right to periodically inspect, calibrate, and ensure operability of any equipment that may be furnished the Fire Department in order to enhance the performance of the support functions.
11. The Fire Department shall furnish and make available to the Fire Department personnel a procedure manual for assisting the BNP Fire Brigade.
12. As compensation for services provided herein by the Fire Department, Progress Energy shall pay to the City of Southport the sum of \$12,000 per year payable on or before December 31, 1987, and each year thereafter.

Sincerely,

(Signature on File)

Norman Holden
City of Southport
Mayor

(Signature on File)

Gregg Cumbee
City of Southport
Fire Chief

TG/TG

SPFD LOA

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James R. Forstner, M.D.
4654 Long Beach Road
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges that I, James R. Forstner, M.D., understand and agree to provide medical supervision and care for employees of the Brunswick Nuclear Plant as requested by responsible plant management personnel.

I am familiar with the Brunswick Emergency Plan and appropriate implementing procedures and understand that injuries might involve ionizing radiation.

I will provide said medical supervision and treatment within the limitations of my training.

Sincerely,

(Signature on File)
James R. Forstner, M.D.

TG / TG

JR Forstner MD LOA

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Peter D Almirall, M.D.
307 Yaupon Drive
Yaupon Beach, North Carolina 28465

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges that I, Peter D. Almirall, M.D., understand and agree to provide medical supervision and care for employees of the Brunswick Nuclear Plant as requested by responsible plant management personnel.

I am familiar with the Brunswick Emergency Plan and appropriate implementing procedures and understand that injuries might involve ionizing radiation.

I will provide said medical supervision and treatment within the limitations of my training.

Sincerely,

(Signature on File)
Peter D. Almirall, M.D.

TG / TG

PD Almirall MD LOA

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J.Arthur Doshier Memorial Hospital
924 Howe Street
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Project
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the J. Arthur Doshier Memorial Hospital's understanding of, and agreement with, actions to be taken in the event of an accident or emergency at the Brunswick Nuclear Project (BNP). Specifically, we are familiar with the BNP Emergency Plan and understand that:

1. A specially designed radiological emergency area will be maintained in state of readiness for use in the event that an accident or injury complicated by possible radiation exposure occurs to your employees. The Doshier Memorial Hospital will admit a patient from the specially designated area for further care if recommended by the supervising physician.
2. In the event of a serious radiation accident, the Hospital will assist in the transfer of patients to the New Hanover Regional Medical Center in Wilmington for further treatment.
3. A Progress Energy representative will be responsible for decontamination of the equipment that is used in treating/decontaminating the person(s) and will replace all hospital equipment that cannot be decontaminated.
4. Adequate instruction of the Medical staff to maintain familiarity with the procedure will be provided by Progress Energy.
5. Disposable articles, such as hats, mask, gowns, and floor coverings, will be provided by and disposed of by Progress Energy.

Copies of the Hospital's Plan and Procedures for the care and treatment of radiologically injured or contaminated patients are kept readily available for use by Hospital employees who will direct the necessary actions.

Sincerely, ..

(Signature on File)

Edgar Haywood
Administrator
J. Arthur Doshier Memorial Hospital

TG/TG

JADMII LOA

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City of Southport Rescue Squad
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Southport Rescue Squad understands and agrees to provide medical assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we are familiar with the Brunswick Emergency Plan and understand that:

1. We may be required to transport a patient who is radioactively contaminated.
2. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Southport Rescue Squad personnel with appropriate monitoring or protective devices.
3. Adequate instructions will be provided by Progress Energy to the Southport Rescue Squad staff to maintain familiarity with the necessary procedures.
4. Any contaminated articles belonging to the Southport Rescue Squad, including the ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Copies of the Southport Rescue Squad's procedures for assisting Progress Energy personnel are kept readily available for use by the Southport Rescue Squad personnel.

Sincerely,

(Signature on File)
Douglas A. Ledgett
Chief
Southport Rescue Squad

(Signature on File)
Rob Gandy
City Manager
City of Southport

TG / TG

SRS LOA

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Yaupon Beach Volunteer Fire Department
8500 East Oak Island Drive
Oak Island, North Carolina 28465

February 19, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 2846-0429

Dear Mr. Atkinson,

This letter acknowledges the Yaupon Beach Volunteer Fire Department's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Yaupon Beach Volunteer Fire department will be available to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Yaupon Beach Volunteer Fire department personnel with appropriate monitoring or protective devices
4. Adequate instruction of the Yaupon Beach Volunteer Fire Department staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to the Yaupon Beach Volunteer Fire Department, including the fire truck, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

James C. Criscoe
Fire Chief
Yaupon Beach Volunteer Fire Department

TG / TG

YBVFD LOA

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Boiling Spring Lakes Fire Department
PO Box# 10718
Southport, North Carolina 28461

February 19, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Boiling Spring Lakes Fire Department's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Members of the Boiling Spring Lakes Volunteer Fire Department may be requested to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Boiling Spring Lakes Fire Department personnel with appropriate monitoring or protective devices.
4. Adequate instruction of the Boiling Spring Lakes Fire Department staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to the Boiling Spring Lakes Fire Department, including fire apparatus, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

Gary W. Bullard
Fire Chief
Boiling Spring Lakes Fire Department

TG / TG

BSLFD LOA

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February 25, 2004

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461

Dear Mr. Atkinson:

This letter is to renew the agreement between Brunswick Nuclear Plant (BNP) and the New Hanover Regional Medical Center and New Hanover Regional Emergency Medical Services. We agree that:

1. J. Arthur Doshier Memorial Hospital is the primary hospital to assist BNP in the event of an accident or medical emergency causing injury/illness to your employees. This letter acknowledges that New Hanover Regional Medical Center (NHRMC) and Cape Fear Hospital (CFH) are available to treat your employees who may become injured and/or contaminated with radioactive and/or other hazardous materials and are transported to the hospital(s). It is requested the New Hanover Regional Medical Center, main campus on 17th Street, be utilized as the primary hospital treatment site. A specifically designated radiological decontamination area will be maintained in a state of readiness. NHRMC will hospitalize persons for further care if recommended by the physician in attendance.
2. A Progress Energy trained representative will be responsible for the decontamination of equipment that is used in treating/decontaminating the person(s) and will expeditiously replace all hospital equipment that cannot be decontaminated.

Copies of your emergency response plan are maintained in the Safety Office at New Hanover Regional Medical Center. As previously agreed, please send all updates to these plans to the Safety Office.

If you have questions or need further assistance, please contact Barbara Bissett, the Director of Emergency Response, Safety Management, and Special Police Services at 343-7084.

Sincerely,

(Signature on File)

James S. Green
Interim Executive Vice President/CFO

cc: Ed Woodard, Vice President/Chief Emergency Medical Services
Barbara Bissett, Director of Emergency Response, Safety Mgmt & Special Police Services
Nancy Woolwine, Interim Director of Emergency Services
Fiscal Services - Contract File

New Hanover Regional Medical Center
P.O. Box 9000 / 2131 S. 17th Street / Wilmington, NC 28402-9000
910-343-7000

0ERP	Rev. 64	B-10
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Oak Island Fire/EMS
4601 East Oak Island Drive
Oak Island, North Carolina 28465

February 6, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Oak Island Fire/EMS's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Oak Island Fire/EMS will be available to fight fires where radioactivity may be present.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Oak Island Fire/EMS personnel with appropriate monitoring or protective devices.
4. Adequate instruction of the Oak Island Fire/EMS staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
5. Any contaminated articles belonging to Oak Island Fire/EMS, including the fire truck, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

—
(Signature on File)
Al Essey
Chief
Oak Island Fire/EMS

TG / TG

OIFEMS LOA

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Brunswick County EMS
P. O. Box 249
Boliva, North Carolina 28422

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Brunswick County Emergency Medical Service understands and agrees to provide medical assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we are familiar with the Brunswick Emergency Plan and understand that:

1. We may be required to transport a patient who is radioactively contaminated.
2. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Brunswick County EMS personnel with appropriate monitoring or protective devices.
3. Adequate instructions will be provided by Progress Energy to the Brunswick County EMS staff to maintain familiarity with the necessary procedures.
4. Any contaminated articles belonging to the Brunswick County EMS, including the ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Copies of the Brunswick County EMS procedures for assisting Progress Energy personnel are kept readily available for use by the Brunswick County EMS personnel.

Sincerely,

(Signature on File)
B.A.Watts EMS Division Head
Director
Brunswick County Emergency Services

TG/TG

BCEMS LOA

0ERP	Rev. 64	B-12
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Sunny Point Fire Department
Military Ocean Terminal - Sunny Point
Southport, North Carolina 28461

February 4, 2003

Mr. Gene Atkinson
Supervisor, Emergency Preparedness
Brunswick Nuclear Plant
PO Box 10429
Southport, North Carolina 28461-0429

Dear Mr. Atkinson,

This letter acknowledges the Sunny Point Fire Department/EMS's understanding and agreement to provide assistance in the event of an emergency at the Brunswick Nuclear Plant. Specifically, we agree to be familiar with the Brunswick Emergency Plan and understand that:

1. Sunny Point Fire Department will be available to fight fires where radioactivity may be present as requested by the Southport Fire Department for assistance.
2. Should it be necessary for more than one fire department to assist in the fighting of a fire at Brunswick, the Southport Fire Department will assume responsibility as lead fire company under the direction of the Brunswick Site Incident Commander.
3. We may be required to transport a patient who is radioactively contaminated.
4. In the event of possible radioactive contamination, qualified Progress Energy personnel will provide Sunny Point Fire Department/EMS personnel with appropriate monitoring or protective devices.
5. Adequate instruction of the Sunny Point Fire Department/EMS staff to maintain familiarity with the necessary procedures will be provided by Progress Energy.
6. Any contaminated articles belonging to the Sunny Point Fire Department/EMS, including the fire truck and ambulance, will be adequately decontaminated or replaced by Progress Energy as expeditiously as possible.

Sincerely,

(Signature on File)

Scott Brown
Chief
Sunny Point Fire Department

TG/TG

SPEMS LOA

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Brunswick Community College
50 College Road NE Bolivia
Supply, NC 28462-0030

Brunswick County Office of Emergency Management
PO Box 9
Bolivia, NC 28422

Progress Energy
Brunswick Nuclear Plant
PO Box 10429
Southport, NC 28461-0429

February 23, 2004

LETTER OF AGREEMENT

The Joint Information Center is a central location used by various emergency agencies to coordinate information to the public and the press in the event of an emergency at the Brunswick Nuclear Plant. The Joint Information Center is staffed by Progress Energy, the State of North Carolina, Brunswick and New Hanover County Emergency Management, the Nuclear Regulatory Commission, and the Federal Emergency Management Agency, as well as other agencies.

This letter delineates the understanding and agreement of Brunswick Community College, Brunswick County, and Progress Energy to provide assistance during drills or exercises and in the event of an accident or emergency at the Brunswick Nuclear Plant requiring activation of the Joint Information Center (hereafter identified as the JIC).

For consideration of the mutual promises stated below, Brunswick Community College (hereafter identified as BCC), Brunswick County Emergency Management, and Progress Energy Brunswick Nuclear Plant (hereafter identified as Progress Energy) agree as follows:

1. BCC shall allow the use of the college facilities and furniture for the JIC. During an emergency, BCC shall allow the use of any facilities needed to meet the needs of the JIC. The primary locations needed for the JIC (for drills or exercises) shall be the Administration Building Multipurpose Room, Classrooms 161 and 162, and the Teaching Auditorium, the first floor rest rooms, and the back entrance to the building. The layout for the JIC can be found on the attached drawings. (JIC layout on file and in accordance with OPEP-02.6.29).
2. Agencies using the JIC and not affiliated with BCC shall carry their own insurance coverage at an adequate level or provide evidence of self-insurance that is acceptable to BCC.
3. Progress Energy shall assume liability for negligent damage to college property or personal injury due to negligence in connection with the use of the JIC.
4. No liability shall be assumed by the BCC Board of Trustees or faculty/staff, individually or collectively, for personal or property injury or loss suffered by reason of using college property.
5. BCC shall provide secure storage areas for JIC equipment needed for a rapid setup of the JIC. Progress Energy agrees to pay all reasonable expenses for installation of cabinets for said equipment.

6. Progress Energy shall provide all telephone equipment needed for the JIC as well as all reasonable telephone installation fees and monthly service charges in connection with JIC telephone services. BCC agrees to allow telephone switching equipment needed for the JIC to be placed in the telephone equipment room and shall allow telephone service to be wired into the primary JIC locations listed above.
7. Progress Energy shall provide electronic equipment (computers, fax machines, small copy machines, etc.) needed for the JIC. BCC equipment may be used but is not guaranteed to be available or in working order. BCC shall allow use of tables, chairs, lighting, heating and cooling, etc., as needed for the JIC. BCC shall allow Progress Energy the use of any large copy machines owned or leased by BCC for use by the JIC in drills and emergencies.
8. BCC shall allow Progress Energy to use radio equipment available to the Campus Security. Should Progress Energy deem necessary, BCC shall allow Progress Energy to install additional radio equipment to allow a backup communications link with the Progress Energy Brunswick Plant. Progress Energy agrees to pay all reasonable expenses for installation of radio equipment.
9. Progress Energy should provide Visitor Parking identification to personnel in the JIC to assist BCC with parking control.
10. BCC shall provide keys to be maintained by Brunswick County Emergency Management that will allow access to the college by Progress Energy and other government agencies should an emergency occur at the Brunswick Plant requiring activation of the JIC.
11. BCC agrees to provide campus police coverage during drills and exercises. BCC agrees to allow Brunswick County Sheriff's Department personnel and the North Carolina Highway Patrol to control access to the college during an emergency that requires activation of the JIC.
12. In the event of an emergency requiring the activation of the JIC, BCC shall provide what manpower is available to help set up the JIC in as short a time as possible.
13. BCC agrees to provide cafeteria services for the JIC during normal college hours and to bill Progress Energy for the reasonable cost of services provided. In an emergency, food service shall be provided as best as possible by BCC depending on the nature of the event. In an emergency, if BCC is unable to provide food services, BCC shall allow the cafeteria to be freely used by the JIC and shall not hinder other vendors from providing food services.
14. BCC agrees to provide maintenance and/or janitorial services for the JIC following use.
15. Reasonable costs incurred by BCC in connection with the JIC for labor provided by employees of the college or personnel associated with the college may be billed to the Progress Energy Brunswick Plant Emergency Preparedness Unit.
16. BCC agrees that Progress Energy shall not be charged for the use of these facilities in support of Brunswick County Emergency Management. Regularly scheduled drills and exercise dates and times shall be provided to BCC as far in advance as possible. This will allow the primary locations to be placed on the college schedule to minimize conflicts with normally scheduled classes.
17. This agreement may not be altered or amended except by a written instrument signed by all parties hereto.
18. This agreement shall remain in place until either party gives a one year notice in writing to the other party that the agreement will be terminated. It is expected that this agreement shall be effective until the Nuclear Regulatory Commission license for the Brunswick Plant expires.

(Signature on File)
Progress Energy
Vice President - Brunswick Nuclear Plant

(Signature on File)
Brunswick Community College
President

(Signature on File)
Brunswick County
County Manager

(Signature on File)
Brunswick County
Emergency Management Director

February 26, 2004

Mr. Randy Thompson
Brunswick County Emergency Management
3325 Old Ocean Highway
PO Box#9
Bolivia, North Carolina 28422

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Memorandum of Understanding Concerning Use of the Brunswick County
EOC Complex for an Alternate Emergency Operations Facility (EOF)

Dear Mr. Thompson:

In response to recent terrorist events, the Nuclear Regulatory Commission and Brunswick Nuclear Plant Emergency Preparedness Organization identified a need to establish an Alternate Emergency Operations Facility (EOF) that is remote from the plant site. The purpose of this memorandum is to document an agreement with you to allow our use of County-approved locations inside the Brunswick County EOC Complex for this purpose.

If needed, we plan to assemble selected members of our Technical Support Center, Operations Support Center, and Emergency Operations Facility at your facility in the Garage Area and Conference Room 113. Brunswick Plant personnel will require access during normal daytime hours and off-hours, using their Progress Energy ID badges. Brunswick County 911 personnel will allow entry of personnel after hours. Personnel will require use of the Garage Area of the EOC Complex as an assembly location, and selected personnel will set up and use Conference Room 113 as the Alternate EOF. They will use basic county-owned equipment in the Conference Room and specialized equipment which has been installed by Progress Energy, including additional supplies located in a storage closet. Note: Activation of our facility will not require relocation of your EOC staff.

Additionally, we intend to periodically use the facility for drill purposes and will coordinate our drill schedule with you in advance.

(Signature on File)

Ed O'Neil
Manager, Support Services
Brunswick Steam Electric Plant
Unit Nos. 1 and 2

(Signature on File)

Randy Thompson
Emergency Management Director
Brunswick County, North Carolina

APPENDIX C
BRUNSWICK NUCLEAR PLANT (BNP)
OFF-SITE AGENCY SUPPORT SUMMARY

<u>Function (NUREG-0654, II.A)</u>	<u>Primary Responsibility</u>	<u>Support Responsibility</u>
1. <u>Command and Control</u>		
a. Onsite	BNP	NRC
b. Offsite	State, County	FEMA Progress Energy Corp
2. <u>Accident Classification</u>		
a. Onsite	BNP	NRC
b. Offsite	N/A	N/A
3. <u>Warning</u>		
a. Onsite	BNP	Local
b. Offsite	County	State, USCG
4. <u>Notification</u>		
a. Onsite	BNP	Local
b. Offsite	BNP	State, Local, Media
5. <u>Communications</u>		
a. Onsite	BNP	NRC
b. Offsite	State, County	Progress Energy Corp. Commercial Phone Co., Progress Energy
6. <u>Transportation</u>		
a. Onsite	BNP/Employees	Local
b. Offsite	Local/Residents	FEMA, State, County
7. <u>Traffic Control Security</u>		
a. Onsite	BNP Security	County
b. Offsite	County	State
8. <u>Accident Assessment</u>		
a. Onsite	BNP	HEEC, HNP, RNP,
b. Offsite	State	NRC, GE, County, Progress Energy Corp., FEMA, EPA, DOE, CAP

APPENDIX C

BRUNSWICK NUCLEAR PLANT (BNP) OFF-SITE AGENCY SUPPORT SUMMARY

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

APPENDIX C
BRUNSWICK NUCLEAR PLANT (BNP)
OFF-SITE AGENCY SUPPORT SUMMARY

17. Exercises
- | | | | |
|----|---------|-------|--|
| a. | Onsite | BNP | Progress Energy Corp.,
NRC |
| b. | Offsite | State | State, County, Progress
Energy Corp., BNP |
18. Recovery/Reentry
- | | | | |
|----|---------|-------|--|
| a. | Onsite | BNP | BNP, RNP, HNP,
Progress Energy Corp.,
NRC, GE, FEMA, |
| b. | Offsite | State | Local, Progress Energy,
DOE, EPA, U.S. DHHS,
USDA |

Note:

BSEP	Brunswick Steam Electric Plant
CAP	Civil Air Patrol
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FEMA	U.S. Federal Emergency Management Agency
GE	General Electric
RNP	Robinson Nuclear Plant
HEEC	Harris Energy & Environmental Center
NRC	U.S. Nuclear Regulatory Commission
USCG	United States Coast Guard
USDA	U.S. Department of Agriculture
US DHHS	U.S. Department of Health & Human Services
HNP	Harris Nuclear Plant

APPENDIX D

This Appendix has been superseded by the BNP Emergency Procedures.

APPENDIX E
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 on site in the plant First Aid Office, if possible. In this facility, initial evaluation of the severity of the injury will be made by first-aid and medical personnel, 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 Doshier Memorial Hospital where special facilities for treatment of contaminated patients have been provided (see Section E.2.2).

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 his alternate senior physician.

E.2. MEDICAL EMERGENCIES

E.2.1 ON-SITE 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 at the Plant First Aid Office located in the O&M Building (if possible) by site medical personnel. This includes all injuries thought not to require immediate hospitalization.

E.2.2 HOSPITALIZATION

If emergency medical treatment can best be given at Doshier Memorial Hospital in Southport (or another facility as may be advised by a competent medical authority), the injured person may be transported to Doshier Memorial Hospital. Doshier Memorial Hospital is the primary hospital for treating medical emergencies occurring at the Brunswick Plant, with New Hanover Regional Medical Center being the backup. OPEP-03.9.3, Transport of Contaminated Injured Personnel, will be followed to prevent the spread of radioactive contamination to off-site areas and facilities. If possible, contaminated clothing and equipment should be removed from the patient, or he should be wrapped in clean sheets or clothing to prevent contamination of the transporting personnel and vehicle.

Medical assistance is immediately available at the Southport area from two general practitioners, both of whom are on the staff of Doshier Memorial Hospital, and who have agreed to provide medical assistance for contaminated patients. Also, the U. S. Department of Energy Radiological Assistance Team will provide medical assistance, if required.

E.2.3 TREATMENT FACILITY

A specially designated emergency area is maintained in readiness at Doshier Memorial 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 ON-SITE MEDICAL SERVICES

Agreement has been reached with doctors in Southport who will provide medical services at the plant site when required. Personnel who are contaminated and who require medical treatment may be treated by a doctor in the Plant's First Aid Office.

E.2.5 EMERGENCY EQUIPMENT

An emergency kit is maintained at Doshier Memorial 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 City of Southport Rescue Squad has agreed to respond to all emergency calls from the plant, just as they respond to other calls from the Southport area.

APPENDIX F
TECHNICAL BASIS FOR SOURCE TERM MIXES

NUREG-1228, Table 2.2 describes the core inventory and coolant concentrations (BWR).

Source Term Categories

Source terms are based upon the core melt sequences, four categories of core damage: 1) normal coolant leakage, 2) spiked coolant leakage, 3) gap release, and 4) in-vessel core melt. 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 mix matrix that is dependent on two parameters, whether or not the fuel is uncovered, and the length of time that the fuel is uncovered. A separate isotopic release fraction is developed for each accident sequence. The major isotopic release fractions are those fractions of core inventory that are released either through failure of the fuel cladding and melting of the core within 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 into account to the extent consistent with the failures that led to the particular accident sequence. To make the results manageable, the accident sequence and the accident isotopic release are grouped. NUREG-1465 is utilized 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.

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 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. RTM-96, Table C-5 lists the reduction factors, and Table C-6 escape fractions are used in developing source term categories that account for removal process. In order to select the proper mix, a release pathway and estimated time duration of core uncover is determined. Reduction factors are applied as scaling factors, as described in NUREG-1228.

There remain three source term special cases of accident mixes which are handled separately in the dose assessment process. 1) Fuel stored in a pool, and the fuel is uncovered; 2) Fuel stored in a pool that is damaged underwater; and 3) Damage to fuel cladding stored in a dry storage cask. Fuel release fractions used in these accidents are derived from NUREG/CR-6451.

OERP	Rev. 64	F-1
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References

1. NUREG-1465, Accident Source Terms for Light Water Nuclear Power Plants, Draft Report for Comment, U.S. Nuclear Regulatory Commission, Washington, DC, June 1992
2. RTM-96, Response Technical Manual, Vol. 1, Rev. 4, U.S. Nuclear Regulatory Commission, Washington, DC, October 1996-NUREG/BR 0150
3. NUREG-1741, RASCAL 3.0: Description of Models and Methods
4. NUREG-1228, Source Term Estimation during Incident Response to Severe Nuclear Power Plant Accidents. 1988
5. BNP Calc. 0B21-0556, Rev. 0

APPENDIX G
MINIMUM PROCEDURES REQUIRED TO IMPLEMENT THE
SECTIONS OF THE PLAN

<u>PLAN</u>	<u>PROCEDURES</u>	
Section 1: Introduction	N/A	
Section 2: Emergency Classifications	0PEP-02.1	Initial Emergency Actions
	0PEP-02.1.1	Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency
Section 3: Emergency Response Organization	0PEP-02.6.6	Environmental Monitoring Team Leader
	0PEP-02.6.12	Activation and Operation of the Operational Support Center
	0PEP-04.7	Brunswick Emergency Notification (Automated Telephone) System
	0PEP-02.6.26	Activation and Operation of the Technical Support Center (TSC)
	0PEP-02.6.27	Activation and Operation of Emergency Operations Facility (EOF)
	0PEP-02.6.28	Off-Site Protective Action Recommendations
	0PEP-02.6.20	Dose Projection Coordinator
	0PEP-02.6.21	Emergency Communicator
	0PEP-02.1.1	Emergency Control - Notification of Unusual Event, Alert, Site Area Emergency, General Emergency
	0PEP-02.6.29	Activation and Operation of the Joint Information Center (JIC)

APPENDIX G (cont'd)

PLAN

Section 4: Emergency
Measures

PROCEDURES

- 0PEP-02.1 Initial Emergency Actions
- 0PEP-02.1.1 Emergency Control - Notification of
Unusual Event, Alert, Site Area
Emergency, General Emergency
- 0PEP-03.1.3 Use of Communication Equipment
- 0PEP-03.4.7 Automation of Off-Site Dose
Projection Procedure
- 0PEP-03.8.2 Personnel Accountability and
Evacuation
- 0PEP-03.9.2 First Aid and Medical Care
- 0PEP-03.9.3 Transport of Contaminated Injured
Personnel
- 0PEP-03.9.6 Search and Rescue
- 0PEP-04.5 Public Education and Information
- 0PEP-03.7.6 Emergency Exposure Controls
- 0PEP-03.7.7 Onsite Radiological Controls

APPENDIX G (cont'd)

PLAN

PROCEDURES

Section 5: Emergency
Facilities and
Equipment

0PEP-03.4.7 Automation of Off-site Dose
Projection Procedure

0PEP-03.5.5 Environmental Monitoring and Plume
Tracking

0PEP-04.7 Brunswick Emergency Notification
(Automated Telephone) System

0PEP-04.2 Emergency Facilities and Equipment

Section 6: Maintaining
Emergency
Preparedness

0PEP-04.1 Record Keeping and Documentation

0PEP-04.2 Emergency Facilities and Equipment
0PEP-04.3 Performance of Training, Exercises,
and Drills

0PEP-04.5 Public Education and Information

0PEP-04.6 Radiological Emergency Kit
Inventories

Section 7: Recovery

0PEP-02.7 Recovery

APPENDIX H

CROSS-REFERENCE BETWEEN NUREG-0654 EVALUATION CRITERIA AND BRUNSWICK RADIOLOGICAL EMERGENCY RESPONSE PLAN

<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
A.1.a	3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8 Appendix C
A.1.b	3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
A.1.c	Figures 3.1-1, 3.2-1, 3.4-1
A.1.d	3.0, 3.2.1
A.1.e	3.2, 3.9
A.2.a	N/A
A.2.b	N/A
A.3	Appendix B
A.4	3.0, 3.2, 3.3, 3.4, 3.5
B.1	3.0, 3.1, 3.2
B.2	3.0, 3.2.1
B.3	3.0, 3.2.1
B.4	3.0, 3.2.1
B.5	3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8
B.6	Section 3 Appendices A, B, C, E Figure 3.2-1

APPENDIX H (Cont'd)

<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
B.7	Section 3
B.7.a	3.3.5, 3.5.2
B.7.b	3.3.1, 3.3.3, Section 7.0
B.7.c	3.2.1, 3.5
B.7.d	3.6
B.8	3.7.1, Table 3.5-1
B.9	3.7.2, Appendix B, Appendix C, Appendix E
C.1.a	3.8.4.1
C.1.b	3.8.4
C.1.c	3.8
C.2.a	N/A
C.2.b	3.3.1.1, 3.5.8, Figure 3.2-1
C.3	5.7.6, 3.7.1, 3.8
C.4	3.7, 3.8, Appendix B, Appendix C, Table 3.5-1
D.1	Section 2.0
D.2	Section 2.0
D.3	N/A
D.4	N/A

APPENDIX H (Cont'd)

<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
E.1	3.9, 4.1, 4.4.1
E.2	3.2, 3.5, 3.9
E.3	3.9
E.4.a-n	OPEP-02.6.21
E.5	N/A
E.6	3.9, 4.4.6, OPEP-02.6.21
E.7	3.9, 4.4.7
F.1.a	3.9, OPEP-02.6.21
F.1.b	3.9, EPL-001, OPEP-02.6.21
F.1.c	3.9, EPL-001, OPEP-02.6.21
F.1.d	3.9, EPL-001, OPEP-02.6.21, OPEP-03.1.3
F.1.e	3.2, 3.9, EPL-001 OPEP-02.6.21, OPEP-04.7
F.1.f	3.9, EPL-001, OPEP-02.6.21
F.2	EPL-001, Table 3.5-1
F.3	6.1.2.1

APPENDIX H (Cont'd)

<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
G.1	4.4.7.1, 6.1.4
G.2	4.4.7.1, 6.1.4
G.3.a	3.6, 5.5
G.3.b	5.4, 5.5
G.4.a	3.6
G.4.b	3.6
G.4.c	3.6, 4.4.7.1
G.5	6.1.4
H.1	5.2, 5.3
H.2	5.4
H.3	N/A
H.4	3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.9 Table 3.5-1
H.5	5.7
H.5.a	5.7
H.5.b	5.7.4
H.5.c	5.7.5
H.5.d	5.8

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
H.6.a	5.7
H.6.b	5.7
H.6.c	5.7.6
H.7	5.7.4, 5.12
H.8	5.7.2
H.9	5.3, Table 5.0-2
H.10	Procedure OPEP-04.6
H.11	Procedure OPEP-04.6 EPL-001
H.12	5.0, 5.7.6
I.1	Section 2, OPEP-02.1, Section 5.0
I.2	4.2, Section 5.0
I.3.a	4.2.2, PEP-03.6.1, PEP 03.6.3, Appendix F
I.3.b	4.2.2, 4.2.3, OPEP-03.4.7, PEP-03.5.5
I.4	4.2.2, OPEP-03.4.7, OPEP-03.6.1
I.5	5.7.2
I.6	4.2.2.3

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
I.7	4.2.4
I.8	4.2.1, 4.2.2, 4.2.3, 4.2.4
I.9	4.2
I.10	4.2
J.1.a	4.4.2, 6.1.1, EPL-001
J.1.b	4.4.2, 6.1.1, EPL-001
J.1.c	4.4.2, 6.1.1
J.1.d	4.4.2, 4.4.6
J.2	4.4.2
J.3	4.4.2.2, 4.4.4.1, 4.4.4.2
J.4	4.4.2.2
J.5	4.4.2.2
J.6.a	4.4.3, 5.9
-- J.6.b	4.4.3, 5.9
J.6.c	4.4.3
J.7	4.1.5, 4.4.7
J.8	4.4.7.3
J.9	N/A

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
J.10.a	4.4.7.3, Figures 1.1-1, 4.4-1, Figure 1.1-2
J.10.b	Figures 1.1-1, 1.1-2, 1.1-6
J.10.c	3.9, 4.4.6
J.10.d	N/A
J.10.e	N/A
J.10.f	N/A
J.10.g	N/A
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
J.11	N/A
J.12	N/A
K.1.a-g	4.4.3
K.2	4.4.3
K.3.a	4.4
K.3.b	4.4
K.4	N/A

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<u>NUREG-0654 Criterion</u>	<u>Brunswick Section(s)</u>
K.5.a	4.4.4
K.5.b	4.4.4.1, 4.4.4.2, 4.4.5
K.6.a	4.4.4
K.6.b	4.4.4
K.6.c	4.4.4
K.7	4.4.4, 4.4.5
L.1	Appendix B, Appendix E, 5.10
L.2	4.4.5, 5.10, Appendix B, Appendix E
L.3	N/A
L.4	3.7.2.1, 3.7.2.2, 4.4.5, Appendix B, Appendix E
M.1	OPEP-02.7, Section 7.0
M.2	7.2, Figure 7.2.1, Table 7.2-1, OPEP-02.7
M.3	7.2, OPEP-02.7
M.4	Figure 1.1-6
N.1.a	6.1.2.2
N.1.b	6.1.2.2
N.2.a	6.1.2.1
N.2.b	6.1.2.1

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NUREG-0654 <u>Criterion</u>	Brunswick <u>Section(s)</u>
N.2.c	6.1.2.1
N.2.d	6.1.2.1
N.2.e	6.1.2.1
N.3.a-f	6.1.2
N.4	6.1.2.2
N.5	6.1.2.2
O.1	6.1.1
O.1.a	6.1.1
O.1.b	N/A
O.2	6.1.1
O.3	6.1.1
O.4.a-j	6.1.1
O.5	6.0, 6.1, 6.1.1
P.1	6.1.3
P.2	6.1.3
P.3	6.1.3
P.4	6.2.1
P.5	6.2.1
P.6	6.2.3

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