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SOUTHERN COMPANY

October 18, 2010

Docket Nos.: 50-348
50-364

NL-10-1987

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

Joseph M. Farley Nuclear Plant
Emergency Plan Revision 51

Ladies and Gentlemen:

In accordance with 10CFR50.54(q) and 10CFR50.4(b)(5), Southern Nuclear Operating Company hereby submits Revision 51 to the Joseph M. Farley Nuclear Plant (FNP) -Units 1 and 2 Emergency Plan.

Revision 51 revises the FNP Emergency Plan to update procedure references and update the Facility Organization to reflect the recent organization changes for Engineering.

If you have any questions regarding this submittal, please contact this office or Mr. Chris Boone, Emergency Planning Manager, at (205) 992-6635.

This letter contains no NRC commitments.

Sincerely,

Mark J Ajluni

M. J. Ajluni
Director Nuclear Licensing

MJA/LWW/lac

Enclosures:

1. Justification for Changes for Revision 51 to the FNP-Emergency Plan
2. Joseph M. Farley-Units 1 and 2 Emergency Plan Revision 51

AX45
NRR

cc: <u>Southern Nuclear Operating Company</u>
Mr. J. T. Gasser, Executive Vice President
Mr. J. R. Johnson, Vice President – Farley
Ms. P. M. Marino, Vice President – Engineering
RTYPE: CFA04.054

<u>U. S. Nuclear Regulatory Commission</u>
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. E. L. Crowe, Senior Resident Inspector – Farley
Mr. P. Boyle, NRR Project Manager

Joseph M. Farley Nuclear Plant
Emergency Plan Revision 51

Enclosure 1

Justification for Changes for Revision 51 to the FNP Emergency Plan

JUSTIFICATION FOR CHANGES FOR REVISION 51 TO THE FNP EMERGENCY PLAN

FNP-0-EP-0	50	51
Procedure Number	Current Revision/Version	New Revision/Version

Page #	Description of Change	Reason for Change
Index of effective pages page 1 and 2	Updated page specific revision numbers	Revised to reflect current revision changes for affected pages
Main body of Plan page 6	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2 and NMP-EP-112 has superseded NMP-EP-109
Main body of Plan page 19	Updated Figure 1	Updated Figure 1 Facility Organization to reflect the recent fleet organization change for Engineering
Main body of Plan page 52	Updated Figure 19	Updated to reflect onsite road infrastructure changes resulting from 10 CFR 73 changes.
Main body of Plan page 58	Deleted procedure reference	NMP-EP-110/111has superseded FNP-0-EIP-9.0 and new NMPs do not contain evacuation and accountability details
Main body of Plan page 62	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2 and NMP-EP-112 has superseded NMP-EP-109
Main body of Plan page 66	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2
Main body of Plan page 67	Added TSC Manager to the list of minimum TSC staff	Align minimum staffing to met the necessary roles and responsibilities for NMP-EP-110/111 per fleet standards
Main body of Plan page 70	Updated note associated with off-site notifications	Updated to reflect personnel performing notifications per new NMPs
Main body of Plan page 73	Revised emergency notification protocols and updated procedure references	• Notification protocols revised per current MOUs with state and local agencies • NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2
Page D-1	Updated procedure references and titles	• NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2 • FNP-0-EIP-28.0 and 28.1 combined
Page D-2	Updated procedure references and titles	• NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2 • Various procedure titles have changed • Add NMP-EP-402 not previously listed
Page D-3	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2
Page D-4	Updated procedure references	FNP-0-EIP-28.0 and 28.1 combined
Page D-5	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2

Page #	Description of Change	Reason for Change
Page D-6	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2
Page D-7	Updated procedure references	NMP-EP-110/111has superseded FNP-0-EIP-9.0/9.2
Page D-8	Updated procedure references	FNP-0-EIP-28.0 and 28.1 combined

Attachment 3
Transmittal Summary and Concurrence Sheet

NL Letter Number: NL-10-1987 Response Due Date (if applicable): 10/22/10

Subject: Joseph M. Farley Nuclear Plant Emergency Plan Revision 51

RLE / Extension: Leann W. Walker / 8-992-5404

SECTION I – CORRESPONDENCE SCREENING (to be completed by RLE)

	YES	NO
Does this letter contain commitments?	*	X
*If YES, has the NL Principal Licensing Engineer been notified?		X
Does this letter affect the FSAR or any other License Basis Documents? If YES, ensure actions are assigned, as appropriate to update the documents, as required. If unsure, obtain peer review from 10 CFR 50.59 qualified individual.		X
Does this letter require posting per 10 CFR 19? If YES, ensure posting after submittal.		X
Does this letter contain Safeguards Information? If YES, do NOT scan to SNC Intranet, and ensure appropriate handling.		X
Does this letter contain information to be withheld from public disclosure (e.g., Proprietary or Non-Safeguards Security-Related Information)? If YES, do NOT scan to SNC Intranet, and ensure appropriate marking and handling. If Proprietary, include appropriate affidavit.		X
Does this letter contain sensitive, limited access or distribution items? If YES, fill in the special handling box with applicable instructions and review with the AA.		X
Oath or Affirmation Required?		X
Licensing Verification Required?		X
Office of External Affairs and General Counsel Consultation Required?		X
Engineering Independent Technical Review (ITR) Required?	**	X
Challenge Board Required?	***	X

Special Handling Instructions

RLE Signature: [signature] Date: 10-13-10

Licensing Peer Checker Signature: [signature] Date: 10-15-10

Signature: N/A Date:
Office of External Affairs and General Counsel

**Signature: N/A Date:
Independent Technical Reviewer

***Signature: N/A Date:
Challenge Board Manager

Attachment 3 (cont'd)
Transmittal Summary and Concurrence Sheet

SECTION II - DEPARTMENTAL REVIEW – Letter Concurrence and AGREEMENT to Perform Action(s) Required to Meet Any Commitments (See Section III). The Purpose Of This Concurrence Sheet Is To Assure The Accuracy And Completeness Of SNC Submittals To The NRC.

A concurrence signature reflects that the signatory has assured that the submittal is appropriate and consistent with SNC Policy, applicable commitments are approved for implementation and supporting documentation for submittal completeness and accuracy has been prepared.

Department/Group	Reviewer Name (Print) Reviewer (Signature) / Date	Statements Verified (list numbers)	Reference Documents	Attached Documents
EMERGENCY PLANNING	JUDITH D. GRANT 10-13-2010		FNP EPLAN REV 51	NL-10-1987

Section III – ACTION ITEMS

REQUIRED ACTION ITEM NUMBER	DUE DATE	PRIORITY*	RESPONSIBLE DEPARTMENT / MANAGER INITIALS
N/A			/
			/
			/
			/
			/

* Actions to meet firm commitments are Priority 3. Actions to meet non-firm commitments are Priority 4.

Attachment 3 (cont'd)
Transmittal Summary and Concurrence Sheet

FINAL REVIEW AND APPROVAL
(Mark "NA" for signatures that are not required, including individual signing letter)

NL Manager or Supervisor: ______________________ Date: 10/15/10

NL Manager: ______________________ Date: 10/15/10

FNP Vice President: N/A ______________________ Date: ____________

HNP Vice President: N/A ______________________ Date: ____________

VEGP Vice President: N/A ______________________ Date: ____________

Vice President: N/A ______________________ Date: ____________
Engineering

Vice President: ______________________ Date: ____________
Fleet Operations

Executive Vice President: N/A ______________________ Date: ____________

RLE Final Review: ______________________ Date: 10-18-10

Admin (date and distribution): ______________________ Date: 10-18-10

Attachment 3 (cont'd)
Transmittal Summary and Concurrence Sheet

EXPLANATION OF SIGNATURES ASSOCIATED WITH ATTACHMENT 3

PREPARER or Responsible Licensing Engineer (RLE): The individual within Licensing responsible for preparing the letter package. This individual is responsible for ensuring that necessary letter package elements are present and included and all items are properly addressed on the concurrence form.

OATH & AFFIRMATION (O&A) is required for submittals that involve License Applications or Amendments per 10 CFR 50.30(b), FSAR Amendments per 10 CFR 50.71(e)(2), or any response to NRC that the staff invokes 10 CFR 50.54(f). Methods for O&A are discussed in Appendix C of this procedure.

VERIFICATION: The RLE is responsible for determining whether a response requires verification in accordance with Appendix D. Appendix D of this procedure provides details on how to assemble an appropriate Verification Package. The department that has been designated as the technical lead for developing input for the response is responsible for providing the supporting documents (objective evidence) for the verifiable statements contained in the response.

COMMITMENTS are identified, assigned as appropriate, and processed in accordance with existing individual site procedures. If no commitments are made, the RLE should state in the cover letter that this letter made no new regulatory commitments.

POSTING REQUIREMENT for incoming and outgoing correspondence must be met in accordance with 10 CFR 19, (i.e., Notices of Violation, proposed imposition of Civil Penalties, and Orders, any of which relate to radiological working conditions).

FSAR IMPACT: The RLE is responsible for determining whether the submittal involves or requires a change to the plant licensing basis and ensuring that an amendment request, if appropriate, is generated in accordance with NMP-AD-009 "Licensing Document Change Requests."

OFFICE OF EXTERNAL AFFAIRS AND GENERAL COUNSEL: The RLE is required to consult with General Counsel on correspondence regarding escalated enforcement, denials of notices of violation, exemptions or exceptions to regulatory requirements or guidelines, comments on proposed legislation or rules, programmatic issues of major significance, and other items as designated by licensing management.

INDEPENDENT TECHNICAL REVIEW (ITR): The RLE is responsible for determining if Engineering ITR is required for a License Amendment or Technical Specification (TS) change (Refer to Section 6.2.1.24 in this procedure for specific process information). If the change is covered by a design change or other qualified input, then listing the engineering document number in lieu of the ITR review is acceptable.

PEER CHECK is a review of the correspondence package prior to issuance of the letter to NRC. Peer Checkers use their licensing institutional knowledge and the guidance in Attachment 2 of this procedure to ensure appropriate submittal quality. A Peer Checker's signature also means that the signatory has confirmed that all licensing aspects of the concurrence sheet are complete and accurate.

Attachment 3 (cont'd)
Transmittal Summary and Concurrence Sheet

CONCURRENCE signatures are obtained from managers of affected departments providing input to the submittal and from departments that may be impacted by the results of the submittal. Signatures indicate that the intent of the submittal is appropriate as it concerns that department and is consistent with SNC policy, applicable commitments are approved for implementation, and documentation to support submittal completeness and accuracy is present and reasonable. Concurrence signatures should include signatures of management reviewers responsible for ensuring technical accuracy of the submittal, subject to confidentiality constraints (e.g., drug test reports, employee allegations, personal information such as name and social security number, EP scenarios, etc.). In lieu of an actual signature, concurrence may be obtained electronically via an e-mail from the management reviewers. The e-mail must clearly indicate management's approval of the submittal. A printed version of the e-mail shall be maintained in the letter package as an attachment to the concurrence sheet.

Joseph M. Farley Nuclear Plant
Emergency Plan Revision 51

Enclosure 2

Joseph M. Farley-Units 1 and 2
Emergency Plan Revision 5

SOUTHERN NUCLEAR OPERATING COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT

UNITS 1 & 2

EMERGENCY PLAN

SAFETY RELATED

APPROVED:

J. R. Johnson
VICE PRESIDENT

9-24-10
Date Approved

Date Issued: 27 Sep 2010

Rev. 51

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JOSEPH M. FARLEY NUCLEAR PLANT
EMERGENCY PLAN

PART I. SITE PLAN

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JOSEPH M. FARLEY NUCLEAR PLANT

EMERGENCY PLAN

I. INTRODUCTION

A. PURPOSE

The purpose of the Joseph M. Farley Nuclear Plant (FNP) Emergency Plan is to protect the health and safety of the general public, persons temporarily visiting or assigned to the plant, and plant employees in accordance with the requirements set forth in Appendix E, "Emergency Plans for Production and Utilization Facilities", of 10CFR50, "Licensing of Production and Utilization Facilities".

Detailed procedures concerning the implementation of the Emergency Plan are not included here but are included in the Emergency Plan Implementing Procedures. These procedures, listed in Appendix 4(D), describe the duties of individuals and groups in the event of an emergency and they also serve as an interface of the Emergency Plan to plant operations, security and radiological control. Supporting emergency plans, which include the emergency plans for the states of Alabama, Georgia, and Florida, are listed in Appendix 6(F).

Information submitted in this plan was developed in accordance with the elements outlined in NUREG-0654, FEMA-REP-1, Rev. 1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants". Information that describes the Emergency Operations Facility (EOF) for Southern Nuclear is outlined in Appendix 7(G).

B. SUMMARY

Southern Nuclear Operating Company corporate management has overall responsibility for maintaining a state of readiness to implement emergency plans for the protection of plant personnel, the general public and property from hazards associated with ionizing radiation originating within a company facility. The authority for planning, developing, and coordinating emergency control measures is discussed in Appendix 9 (I), Responsibility For The Planning Effort.

The Farley Plant Emergency Plan describes the organization and facilities both onsite and offsite that will be used to deal with a spectrum of accidents ranging from minor onsite incidents to those that could affect the general public.

There are three phases of responsive action contained within the Farley Plant Emergency Plan. The first phase includes initial actions directed toward the protection of personnel and the elimination of the potential for further exposure to the hazard.

The second phase includes immediate and planned action directed toward termination of the incident, containment of the effluent, establishment of incident boundaries, establishment of control, channeling of information and protection of the facility and equipment. The third phase is to restore the facility to its normal operating condition. To respond effectively utilizing these phases, emergencies are classified according to increasing severity as Notification of Unusual Event, Alert, Site Area Emergency or General Emergency.

C. GENERAL INFORMATION

1. Definitions

a. Affected Persons

Individuals who have been radiologically exposed or physically injured as a result of an accident to a degree requiring special attention, e.g., decontamination, first aid, or medical services.

b. Assessment Actions

Those actions taken during or after an accident which are collectively necessary to make decisions to implement specific emergency measures.

c. Controlled Area

The Controlled Area is the fenced area immediately surrounding the nuclear plant, access to which is controlled for industrial security purposes.

d. Corrective Action

Those emergency measures taken to terminate an emergency situation at or near the source of the problem.

e. Emergency Action Levels

Radiological dose rates; specific contamination levels of airborne, waterborne or surface deposited concentrations of radioactive materials; or specific instrument indications (including their rates of change) that may be used as thresholds for initiating such specific emergency measures as designating a particular class of emergency, initiating a notification procedure or initiating a particular protective action.

f. EOF Manager

The EOF Manager is responsible for the activation of the corporate emergency organization and for providing corporate emergency support prior to and following Emergency Operations Facility activation.

g. Emergency Director

The Plant Manager or designated alternate as the Emergency Director is charged with the responsibility of overall direction of the plant emergency activity and with initial interfacing with offsite groups.

h. HOSTILE ACTION

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

i. HOSTILE FORCE

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

j. Offsite

All land and water areas outside the site property lines are considered to be offsite.

k. Onsite

All land and water areas inside the site property lines, use of which must be authorized by SNC, is referred to as onsite.

l. Population at Risk

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

m. Protected Area

The Protected Area is the fenced area immediately surrounding the plant Vital Areas, access to which is limited to those individuals with good cause for entry.

n. Protective Action Guides

Projected radiological dose or dose commitment values to individuals in the general population that warrant protective action following a release of radioactive material.

o. Protective Actions

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

p. Radiation Controlled Area

The containment and the potentially contaminated portion of the Auxiliary Building and other areas onsite such as High Radiation Area, Radiation Area, Radioactive Materials Area, Airborne Radioactivity Area or Contaminated Area.

q. Recovery Actions

Those actions taken after the emergency to restore the plant as nearly as possible to its pre-emergency condition.

r. Vital Area

The Vital Areas are those plant areas which enclose major systems, equipment and components necessary to prevent or mitigate the consequences of an accident.

2. Emergency Ingress and Egress

a. Emergency Ingress

Ingress to any area of the plant can be obtained by the use of keys which are maintained by the Shift Supervisor and the Senior Security Force Member. In the case of electrically locked doors, keys will override the locking device. The necessary keys will be issued as required to combat the emergency.

b. Emergency Egress

Egress from any area of the plant is assured without keys, electrical power or other devices.

II. ORGANIZATION

The organization, responsibilities and functions of Southern Nuclear Operating Company onsite and offsite resources are individually discussed below. The onsite and offsite organizations provide emergency response during the activation, emergency, and recovery phases of accident response. Principal federal, state, local and private agencies are also discussed. Figures 12 and 13 illustrate the interrelationships of these organizations before and after Emergency Operations Facility activation respectively.

A. ONSITE

The normal onsite organization for Farley Nuclear Plant is shown on Figure 1. Management positions in the onsite organization meet the qualification requirements of ANSI N18.1-1971.

The qualifications for the professional-technical level positions also meet the requirements of ANSI N18.1-1971.

1. Technical Support Center (TSC)

The emergency onsite organization implemented for events requiring activation of the TSC is described in FNP-0-EIP-0 and is shown in Figure 2. Responsibilities and authorities of personnel in the TSC emergency organization are as follows:

a. Emergency Director (ED)

The ED is charged with the responsibility of overall direction of onsite emergency activity including near-site field monitoring team dispatch and control and interfacing with offsite organizations and agencies until the Emergency Operations Facility (EOF) is activated. After the EOF is functional, the ED is responsible for overall direction of all in-plant emergency activity. The ED shall supervise the TSC and manage the in plant recovery efforts and the in plant recovery organization. The ED shall communicate directly with the EOF Manager when the EOF is activated and shall have full authority to direct the onsite recovery efforts without further consultation when the situation demands such action. Following EOF activation when time permits the ED will consult with EOF personnel prior to initiating major evolutions or changes in plant configuration. The ED's general responsibilities include:

1) Staffing the TSC. The TSC will be staffed by plant supervisory personnel supplemented by plant engineering, technical and administrative personnel as necessary to staff the TSC 24 hours a day and discharge the responsibilities discussed below.

2) Evaluating the classification of the emergency and amending as appropriate. Terminating an emergency level will not be delegated to other elements of the emergency organization and will be performed in accordance with approved procedures.

3) Verifying correct control room response to the emergency classification.

4) Determining radiological status and initiating notifications to state agencies (and local agencies for General Emergencies). The decision to notify offsite government agencies may not be delegated to any other element of the emergency organization.

5) Initiating, on initial or upgrade emergency notifications, recommendations to state agencies on advisability of evacuations. Recommendations to local agencies when state authorities cannot be contacted for immediate evacuation may not be delegated to any other element of the emergency organization.

6) Initiating rescue or emergency repair operations as appropriate.

7) Maintaining plant security.

8) Establishing communications with and providing information to the EOF Manager.

In fulfilling the above listed responsibilities the Emergency Director (ED) is guided by the procedures listed below:

FNP-0-EIP-3	Duties of the Emergency Director
FNP-0-EIP-8.1	Emergency Phone Directory
FNP-0-EIP-8.3	Communication Equipment Operating Procedures
FNP-0-EIP-9.3	Personal Computer-Automated Dose Assessment Method
NMP-EP-110	Emergency Classification Determination and Initial Action
NMP-EP-111	Emergency Notifications
NMP-EP-112	Protective Action Recommendations

The ED position is initially filled by the Shift Manager until relieved by the on-call ED. It is the intent of SNC that the ED will be transferred from the Control Room as soon as practicable.

The line of succession of individuals who may serve as the ED is as follows:

Vice President - Farley

Plant Manager

Site Support Manager

Operations Manager

On-call Operations Supervisor

Shift Manager

Shift Supervisor

Other Managers or staff designated by the Plant Manager

The above line of succession does not preclude higher level management from assuming the role of Emergency Director (ED)in any circumstance which, in the judgment of the manager, is appropriate or necessary to protect the health and safety of the public. This designation also does not relieve higher level management from the responsibility to be aware of those circumstances that may initiate this action. These individuals will be trained as ED's.

b. TSC Manager

The on-call TSC Manager reports to the Technical Support Center (TSC) and is responsible for implementing FNP-0-EIP-6, "TSC Setup and Activation", which includes coordination of communications between the TSC and other locations and coordination of engineering support and log maintenance.

c. Operations Supervisor

The on-call Operations Supervisor reports to the Technical Support Center (TSC) and is responsible for coordinating the efforts of the operating crew, advising the ED on emergency operations and facilitating communications between the ED and Shift Supervisor. Supervisory personnel designated by the Plant Manager and holding a Senior Reactor Operator License rotate as the on-call Operations Supervisor.

d. Maintenance Supervisor

The on-call Maintenance Supervisor reports to the TSC and is responsible for implementing FNP-0-EIP-5, "Maintenance Support to the Emergency Plan", including coordination of the efforts of Emergency Repair Parties and advising the ED on proposed modifications, alterations or repair to plant systems and on specifics of plant systems and equipment. Supervisory I&C and Maintenance personnel designated by the Plant Manager rotate as the on-call Maintenance Supervisor.

e. Health Physics Supervisor

The Health Physics Supervisor reports to the TSC and is responsible for implementation of FNP-0-EIP-4, "Health Physics Support to the Emergency Plan", including coordination of the efforts of in-plant Field Monitoring Teams, decontamination activities, Health Physics and ALARA support, and advising the ED on the status of onsite and offsite radiation protection activities. This individual is also responsible for coordination of out-of-plant and SNC offsite Field Monitoring Teams until relieved by the Emergency Operations Facility (EOF) staff. The Health Physics Supervisor and other supervisory personnel designated by the Plant Manager and, to the maximum extent possible, meeting the requirements of Regulatory Guide 1.8, September 1975, rotate as the on-call Health Physics Supervisor.

f. Security

Security supervision is responsible for implementing FNP-0-EIP-7, "Security Support to the Emergency Plan", maintaining site security and advising the ED.

g. Engineering Supervisor

The on-call Engineering Supervisor coordinates offsite dose projections until relieved by the Emergency Operations Facility (EOF) staff. Until relieved by the EOF staff, the Technical Support Center (TSC) is responsible for communications with the Nuclear Regulatory Commission (NRC), state and local government agencies and other offsite authorities. During that period, the Engineering Supervisor is responsible for supervising collection of pre-identified information for transmittal to offsite authorities, responding to requests from offsite agencies for information, coordinating approval by the Emergency Director or his designee of all information transmitted to offsite authorities and for routing incoming information to the appropriate personnel. This position will be filled by a qualified individual designated by the Plant Manager.

h. Shift Manager

The Shift Manager is responsible for directing operational activities to classify and combat the emergency as delineated in FNP-0-EIP-3, "Duties of the Emergency Director". The Shift Manager acts as the Emergency Director (ED) until relieved by the on-call ED and until relieved has the authority and responsibility to immediately and unilaterally initiate any necessary emergency actions, including providing protective action recommendations to authorities responsible for implementing offsite emergency measures.

i. Emergency Repair Party

The Emergency Repair Party, as shown in Figure 2, is a group of personnel competent in operations and repair work who will be used during an emergency situation to make temporary repairs to systems/components in order to mitigate the effects of the emergency. An Emergency Repair Party for initial re-entry and repair will consist of individuals as required from the following personnel groups:

Operations Personnel
Maintenance Personnel
Instrumentation and Control Personnel
Health Physics Personnel
Chemistry Personnel

j. Field Monitoring Team (FMT)

The Field Monitoring Teams, as shown in Figure 2, consisting of permanent plant employees and/or qualified vendor personnel, will perform onsite and offsite monitoring. They will provide radiation protection support at the Southeast Alabama Medical Center, during transport of potentially irradiated and/or contaminated casualties, and at the Assembly areas, and at any other location onsite or offsite as instructed by the Emergency Director (ED) or EOF Manager.

To perform these functions a number of teams will be designated consisting of a Team Leader and an Assistant.

Team Leader - A Health Physics Technician or qualified vendor technician.
Assistant - Any qualified plant employee or vendor personnel.

k. Dose Assessment Staff

The Shift Supervisor is responsible for offsite dose projections until relieved by the Technical Support Center (TSC) staff. Personnel reporting to the Engineering Supervisor are responsible for making dose projections until the Emergency Operations Facility (EOF) is activated, at which time EOF dose assessment personnel become responsible for making offsite dose projections. These projections may initially be made automatically by a computerized dose projection program described in FNP-0-M-007 Emergency Dose Calculation Manual using guidance found in FNP-0-EIP-9.1"Automated Dose Assessment Method". A manual personal computer methodology is provided in FNP-0-EIP-9.3, "Personal Computer Automated Dose Assessment Method" for long term dose assessment or in the event that the automatic computerized system is inoperable. Normally, dose projections are transmitted to appropriate state authorities by telecopy, commercial telephone, the Emergency Notification Network (ENN) or by posting dose projections on the SNC Integrated Data Display System. The Emergency Notification System (ENS), Health Physics Network (HPN), and commercial telephone lines are available for transmission of dose assessment data to the NRC. Data will be provided as directed by the NRC at the time of need.

l. Additional Plant Staff Assignments

1) Operations Support Center (OSC) Manager

The OSC Manager will be considered to be the senior individual in the OSC and will report to the Maintenance Supervisor. The OSC Manager will take the lead in coordinating the activities of the OSC or other location directed by the Emergency Director per FNP-0-EIP-5.0. The senior individual at each of the Assembly Areas will become the supervisor at that location. The Assembly Area senior individual will take the lead in coordinating the activities of the Assembly Area in support of OSC operations as directed by the OSC Manager.

2) Radiological monitoring

The Health Physics Group is responsible for all aspects of applied health physics. Emergency monitoring will be provided by a Health Physics Technician on shift, a qualified/trained vendor technician, or qualified member of the plant staff. Health Physics supervision will be responsible for relocation of access control to both units as necessary, and for implementing procedures for handling highly radioactive samples.

3) Fire Fighting and Rescue

The plant fire brigade and rescue team on all shifts will be composed of personnel described in FNP-0-AP-37. The fire brigade will be directed by the Fire Brigade Chief with the aid of FNP-0-EIP-13.

4) First Aid

At least one person on each shift will be qualified to perform first aid.

5) Decontamination

Personnel decontamination is the responsibility of the Health Physics Group and during an emergency the responsibility of the Field Monitoring Team.

Area and equipment decontamination onsite as the result of an accident will be a joint effort of personnel from the Operations, Maintenance, Chemistry and Health Physics Groups.

6) Personnel Accountability

Personnel accountability is the responsibility of each plant supervisor or senior individual onsite in the group. That is, each supervisor is responsible for accounting for each person onsite in his group or visiting his group. Details for personnel accountability are provided by FNP-0-EIP-10, "Evacuation and Personnel Accountability". Information pertinent to personnel accountability will be kept by security guards at each access control point.

7) Record Keeping

A record of all significant events that occur will be kept by the operating crew in the Plant Operator's Logbook. A log will be kept by a designated plant staff member who will be responsible for maintaining communications with the corporate headquarters, and offsite authorities as directed by the Emergency Director. Radiological information such as radiological survey data, personnel exposures, decontamination activities and information from onsite groups will be maintained by the Health Physics Supervisor.

8) Communications

Responsibility for initial offsite communications will be handled by the Shift Supervisor or Emergency Director. After the emergency organization is activated, designated plant staff member(s) may be assigned to maintain communications with the Emergency Operations Facility (EOF)and with offsite authorities. If the Emergency Director is not located in the control room he may maintain communications with the control room through an assigned individual. When the Emergency Operations Facility (EOF) is activated, the EOF staff may handle communication with offsite authorities. Communications interfaces are shown in Figure 3.

B. OFFSITE

The normal Alabama Power Company (APC) offsite company organization is shown in Figure 5. The normal Southern Nuclear Company Corporate organization and its relationship to the onsite organization is shown in Figure 6. The Emergency Communication Organization is shown and described in the Emergency Communications Plan in Appendix 10(J).

The offsite emergency organizations and their duties and responsibilities are described below:

1. Emergency Operations Facility (EOF)

   The Emergency Operations Facility (EOF) Emergency Response Organization (ERO) and its relationship to the Technical Support Center (TSC) emergency organization is described in Appendix 7(G).

2. Corporate Organization

   In the event of an emergency condition at FNP that requires activation of the Corporate Emergency Response Organization (ERO) the organization will be activated to notify Emergency Organization personnel and to provide corporate support from SNC.

   a. Corporate Duty Manager

      The Duty Manager is responsible for the overall management of emergency support at FNP. The Duty Manager is the primary contact for support from off-site agencies, and provides assistance, and advice to the EOF Manager and Emergency Director in decisions involving the overall effect of the event. The Duty Manager will serve as the corporate spokesperson until such time as an alternate Duty Manager or other trained individual is available to assume the role of spokesperson. This position will be filled by a qualified individual designated by the Executive Vice President.

3. Emergency Communication Organization

   The Emergency Communication Organization (ECO) is discussed in Appendix 10(J).

4. Recovery Phase Organization

Upon termination of the emergency condition and at the discretion of the Emergency Director, the SNC Emergency Organization will shift to the Recovery Phase Organization shown in Figure 10. The Recovery Manager has authority to modify the organization as deemed necessary.

Responsibilities and authorities are:

a. Recovery Manager

The Recovery Manager shall direct the overall recovery effort.
He has the full authority and responsibility to make decisions regarding plant recovery and return to operation. This position will be filled by the Vice President – Farley or designee.

b. Recovery Support Director

The Recovery Support Director is responsible for all administrative aspects of recovery activity. The line of succession for the Recovery Support Director shall be designated by the Vice President –Farley should the Recovery Organization be required.

c. Technical Support Director

The Technical Support Director is responsible for managing all supplemental engineering, technical and licensing support resources needed in the recovery effort. The line of succession for the Technical Support Director shall be designated by the Vice President –Farley should the Recovery Organization be required.

d. Recovery Support Supervisor

The Recovery Support Supervisor is responsible for coordinating or monitoring operational support recovery activities as directed by the Recovery Support Director. This position will be filled by a qualified individual designated by the Recovery Support Director.

e. Administrative Support Supervisor

The Administrative Support Supervisor is responsible for supervising EOF recovery phase administrative activities including:

1) Special communications needs

2) Manpower augmentation

3) Personnel Affairs for temporarily assigned personnel

4) Special Budget Activities

5) Clerical Support

6) Other activities as assigned by the Recovery Support Director

This position will be filled by a qualified individual designated by the Recovery Support Director.

f. Engineering Supervisor

The Engineering Supervisor is responsible for offsite engineering resources directed toward design modification, major repair and engineering evaluations associated with recovery and return to operation. Responsibilities include:

1) Coordination of offsite engineering and technical support for design changes and repairs

2) Interfacing with Architect/Engineering firms for detailed technical support

3) Interfacing with NSSS supplier for detailed analyses and technical support

4) Coordinating and expediting procurement activities.

This position will be filled by a qualified individual designated by the Technical Support Director.

g. Licensing Supervisor

The Licensing Supervisor is responsible for all recovery phase licensing activities. His responsibilities include:

1) Interfacing with the NRC to resolve license issues

2) Interfacing with Architect/Engineer firms or NSSS supplier to obtain technical and engineering analyses as necessary to resolve licensing issues

3) Coordinating with the Engineering Supervisor on design changes resulting from licensing issue resolution

4) Preparation of NRC required reports associated with the accident or recovery effort.

This position will be filled by a qualified individual designated by the Technical Support Director.

C. OUTSIDE ORGANIZATIONS

Coordination with Governmental agencies is discussed in Appendix 7(G), section E. The following provides additional site specific details to the Appendix 7(G) discussion.

1. Government Agencies

The Nuclear Regulatory Commission has published its incident response plan in NUREG-0728, specifying NRC actions, responsibilities, functions and authorities during an emergency. Written agreements have been reached with the other offsite agencies listed below with regard to the type of support that will be furnished to the Joseph M. Farley Nuclear Plant in the event of an emergency. These agreements have been developed to ensure that there is a clear understanding of assigned responsibilities and that there will be proper coordination of activities in the event of an emergency. Letters of Agreement on File with offsite support groups are given in Part I, Appendix 2(B).

Corporate and/or plant personnel will be dispatched to principal government agencies on an as needed basis.

Anticipated offsite federal assistance is discussed in the individual state plans.

a. Department of Energy Savannah River Operations Office

In the event of a General Emergency, the DOE Savannah River Operations Office has agreed to provide a DOE Radiological Assistance Team. This assistance team will be limited to advisory assistance in handling radiological emergencies. The Emergency Director is authorized to request this assistance.

b. Nuclear Regulatory Commission

Upon notification of an emergency condition, the NRC will implement the incident response plan described in NUREG-0728. In addition to fulfilling its regulatory responsibilities, it is expected that the NRC will provide technical assistance and recommendations. For Site Area and General Emergencies, dispatch to SNC facilities of a NRC Region II site team is anticipated with arrival expected 2 to 6 hours following notification. As described in Section III, office space, telephones, etc. have been provided for NRC personnel at the Technical Support Center and Emergency Operations Facility.

c. State of Alabama

The Alabama Radiation Control Division of the State of Alabama Department of Public Health is responsible for initiating the "Alabama Radiological Response Plan for Nuclear Power Plants" in support of an emergency at the Farley Nuclear Plant. This plan provides a detailed description of the notification procedures and responsibilities and duties of the local and state agencies involved. Since the primary concern of the Alabama Radiation Control Division is for the welfare and safety of the general public, they will have primary responsibility and authority for handling the offsite aspects of the emergency in Alabama.

d. State of Georgia

Upon notification of an emergency condition, the Georgia Emergency Management Agency will implement the "State of Georgia Radiological Emergency Plan". The Georgia Emergency Management Agency has the authority and responsibility for coordinating the efforts of local and state agencies in Georgia to provide for the health and safety of the general public in the event of a radiological incident.

e. State of Florida

Upon notification of an emergency condition by SNC or the Alabama Emergency Management Agency, the Florida Department of Community Affairs, Division of Emergency Management, State Warning Point will implement the "State of Florida Radiological Emergency Management Plan for Nuclear Power Plants". The Department of Community Affairs, Division of Emergency Management has the authority and responsibility for coordinating the efforts of local and state agencies in Florida to provide for the health and safety of the general public in the event of a radiological incident. The Department of Health-Bureau of Radiation Control will provide support to the Company in matters related to the Florida ingestion pathway radiological emergency response.

f. Houston County, Alabama

The Chairman of the Houston County Commission has the overall responsibility for emergency preparedness and local response in Houston County. Houston County has also accepted responsibility for evacuations in Henry County out to the 10 mile EPZ. The Houston County Emergency Management Agency coordinates planning and operations of all local agencies in support of an incident at Farley Nuclear Plant. A detailed emergency plan is maintained in case of an emergency at the Farley Nuclear Plant. This plan is Part I of the "Alabama Radiological Response Plan for Nuclear Power Plants".

g. Early County, Georgia

The Chairman, Early County Board of Commissioners, has responsibility for overall radiological emergency response planning. The actual plan development and coordination of emergency actions is carried out by the Blakely-Early County Emergency Management Agency. The "Blakely-Early County Emergency Management Agency Radiological Emergency Plan for Nuclear Incidents/Accidents Involving Joseph M. Farley Nuclear Power Plant" is given as part of the "State of Georgia Radiological Emergency Plan".

h. City of Dothan, Alabama - Fire Department

In the event an emergency (Section IV) is declared as a result of a fire at Farley Nuclear Plant, the Dothan Fire Department has agreed to provide support to help combat the fire. The Dothan Fire Department resources are listed in FNP-0-EIP-13, "Fire Emergencies". The estimated response time to Farley Nuclear Plant is 30 minutes. The Emergency Director is authorized to request this assistance.

2. Contractor and Private Offsite Organizations

a. Southern Nuclear/Southern Company Services

Southern Company Services, Incorporated (SCS), an affiliated service company, served as the original architect-engineer. As a result of the consolidation of SCS and SNC nuclear expertise, and in addition to being the licensee, SNC also serves as its own architect-engineer and performs functions previously performed by SCS to include design, licensing, and fuel management support during normal operation.

b. Bechtel Power Corporation

Bechtel is the architect/engineer for portions of Unit 1 and for Unit 2. Bechtel provides support in the areas of new concept design (including drawings, specifications, safety reviews, etc.); modification design; engineering support for licensing issues; and as advisor on component and system operation. The Engineering Support Manager (Emergency Support Phase) and the Technical Support Director (Recovery Phase) interface directly with Bechtel.

c. Westinghouse

Westinghouse is the NSSS supplier for both Farley units. Their support activities associated with the NSSS include installation, testing, and corrective action assistance in their scope of supply; engineering support for licensing issues; new concepts design and modification design; advisor on components and systems; and engineering support related to operation, maintenance, and corrective action. The Engineering Support Manager (Emergency Support Phase) and the Technical Support Director (Recovery Phase) provide interface with Westinghouse either directly or through SCSI.

d. Institute of Nuclear Power Operations (INPO), Nuclear Energy Institute (NEI)and Electric Power Research Institute (EPRI).

Southern Nuclear Operating Company is a participating member of INPO and as such will have available technical expertise from this organization in areas of nuclear power plant operation in accordance with established agreements (Letter of Agreement - Appendix 2(B)). Also, INPO and EPRI have a plan describing their combined emergency information response capabilities. Their assistance is available to Southern Nuclear Operating Company (Letter of Agreement - Appendix 2(B)).

e. Maintenance Assistance

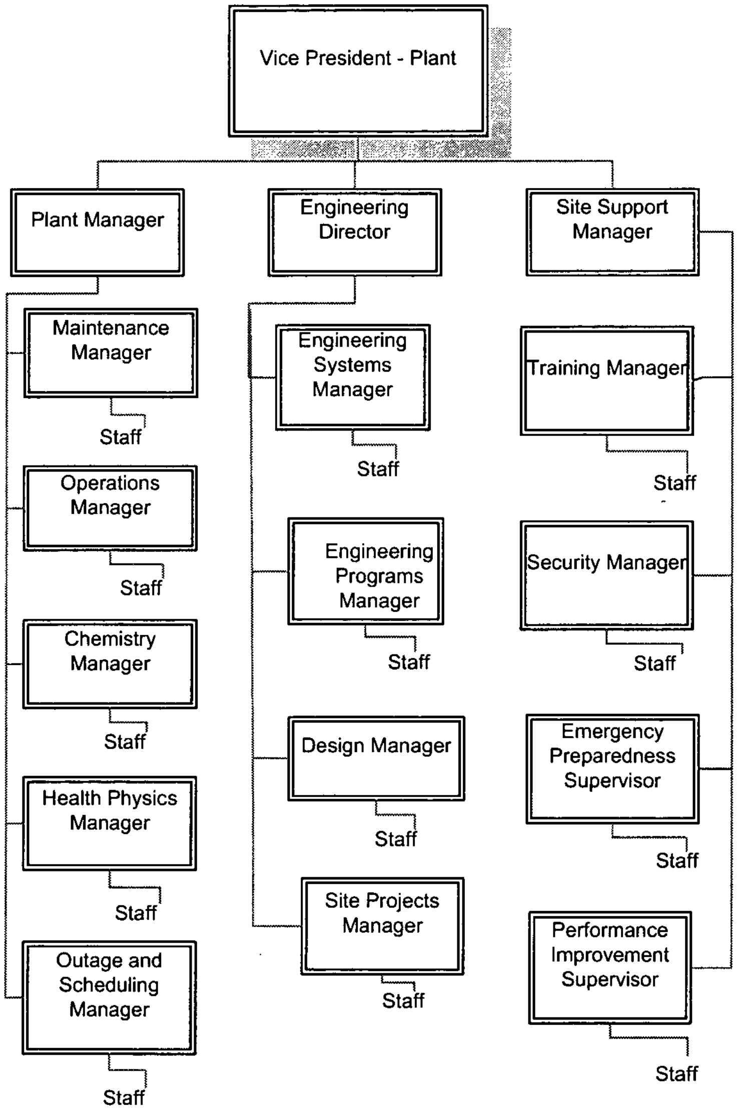
Assistance in the area of maintenance and repair is made available by contractor organizations.

f. Radiological Monitoring Assistance.

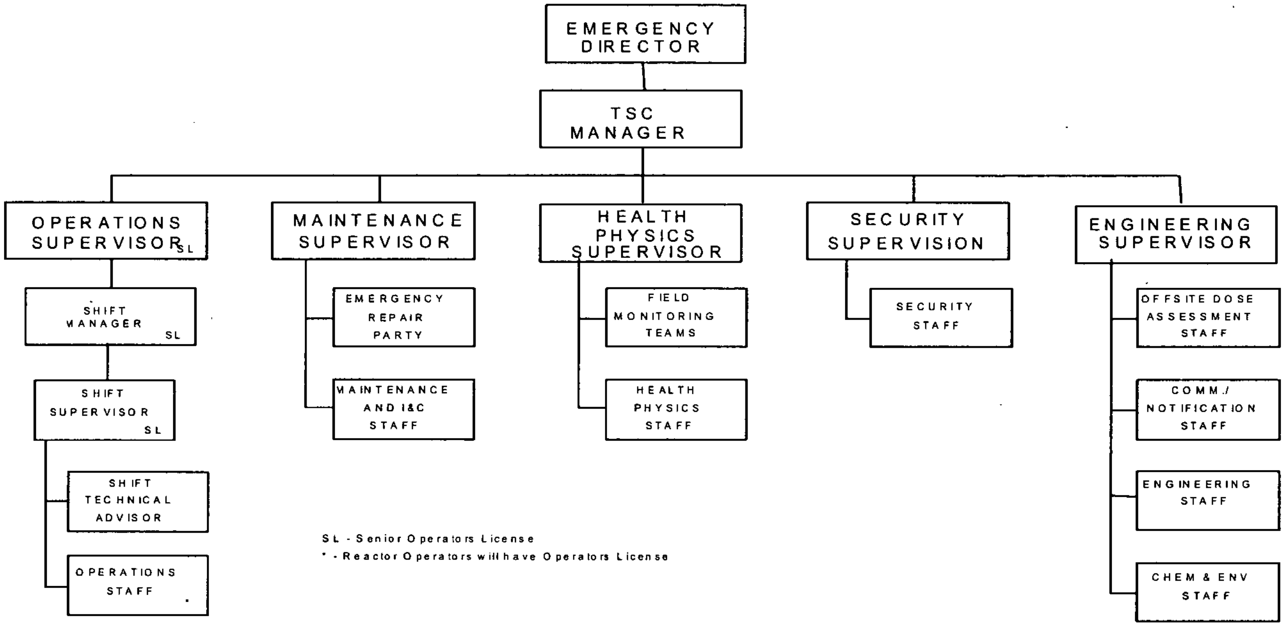
Radiological monitoring in the plant and in the environs both onsite and offsite will be augmented by outside vendors
as necessary. Initial radiological monitoring will be performed by available Southern Company resources, (e.g., Georgia Power Company (GPC) Central Laboratory).

g. Other Utilities

Southern Nuclear Operating Company is a signatory to the "Voluntary Assistance Agreement By and Among Electric Utilities Involved in Transportation of Nuclear Materials" and a signatory to the "Nuclear Power Plant Emergency Response Voluntary Assistance Agreement" (see Appendix 2(B)). Although these agreements do not impose an obligation on any signatory to provide assistance, they establish the contractual framework by which assistance may be requested and provided expeditiously.

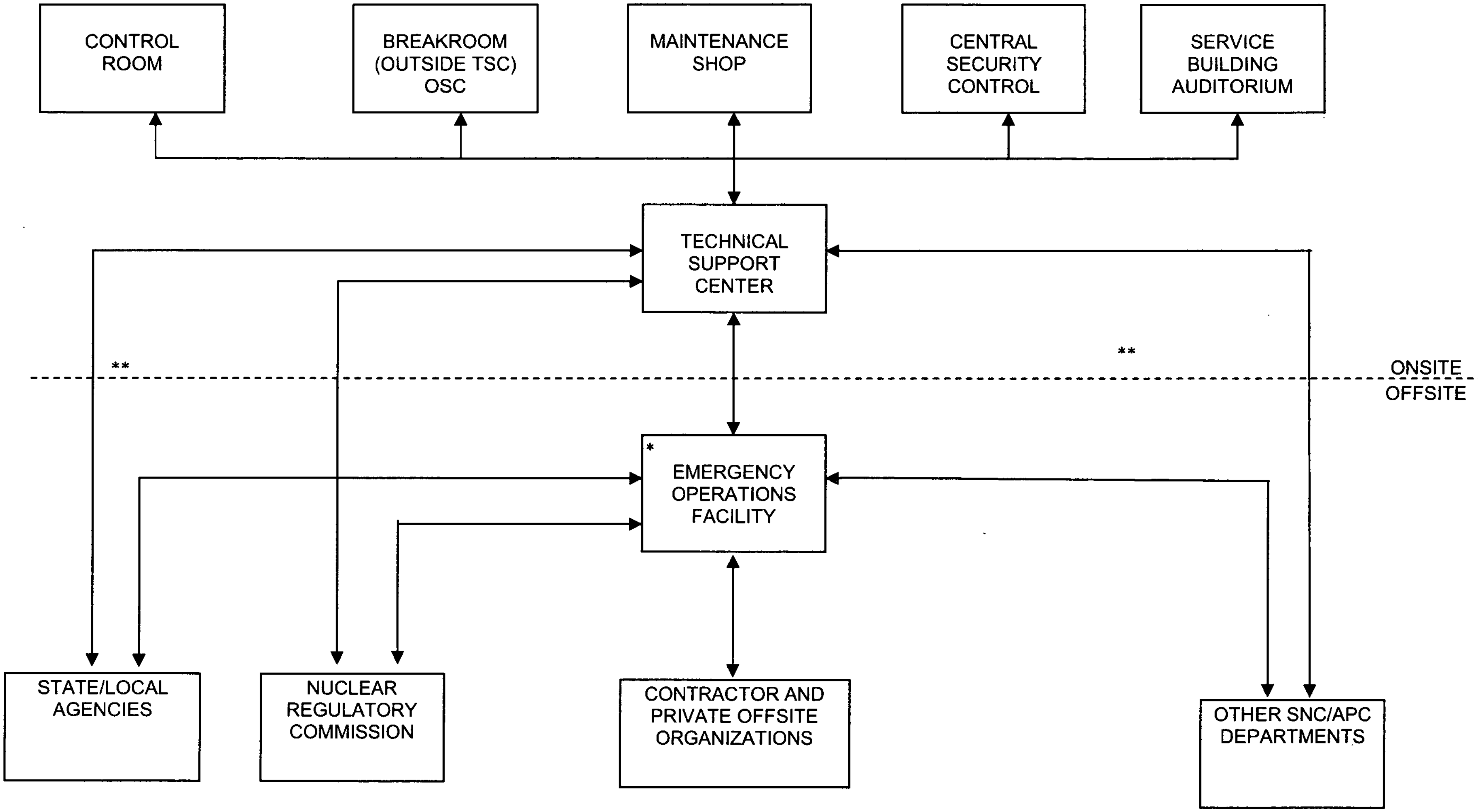


FACILITY ORGANIZATION
Figure 1



TECHNICAL SUPPORT CENTER EMERGENCY RESPONSE ORGANIZATION

Figure 2



*When Activated
**Prior To EOF Activated

COMMUNICATIONS INTERFACES
Figure 3

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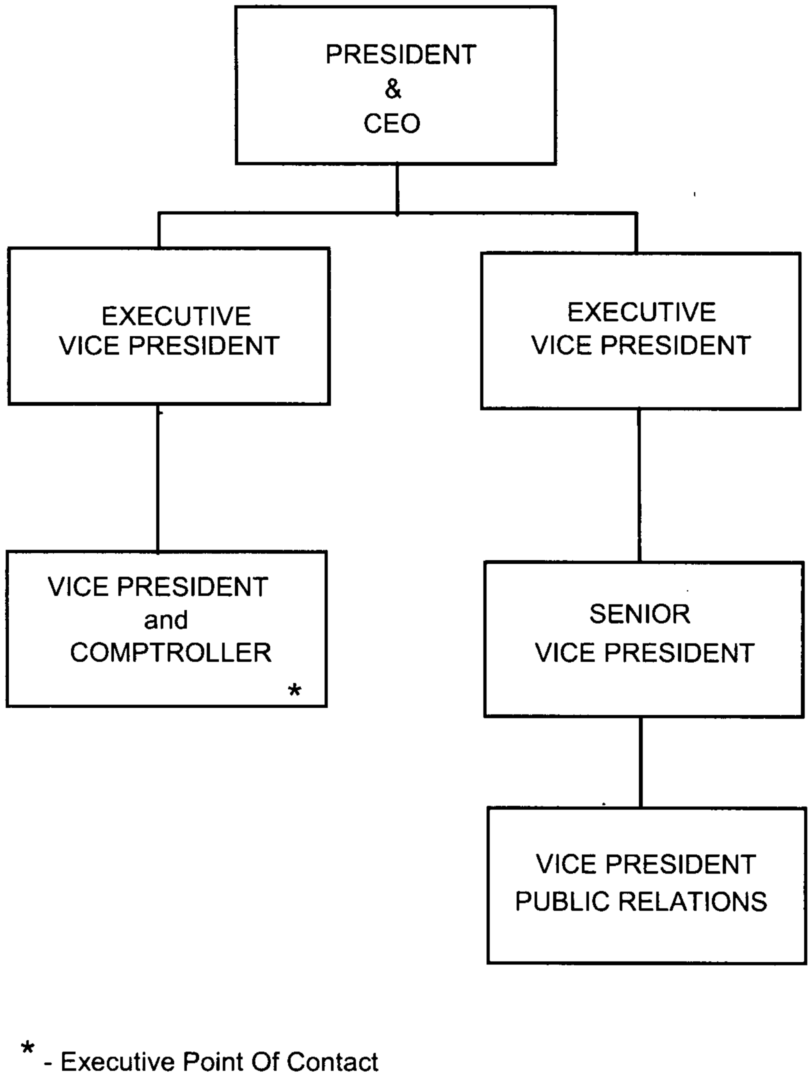
Figure 4



APC NORMAL OFFSITE CORPORATE ORGANIZATION

FIGURE 5

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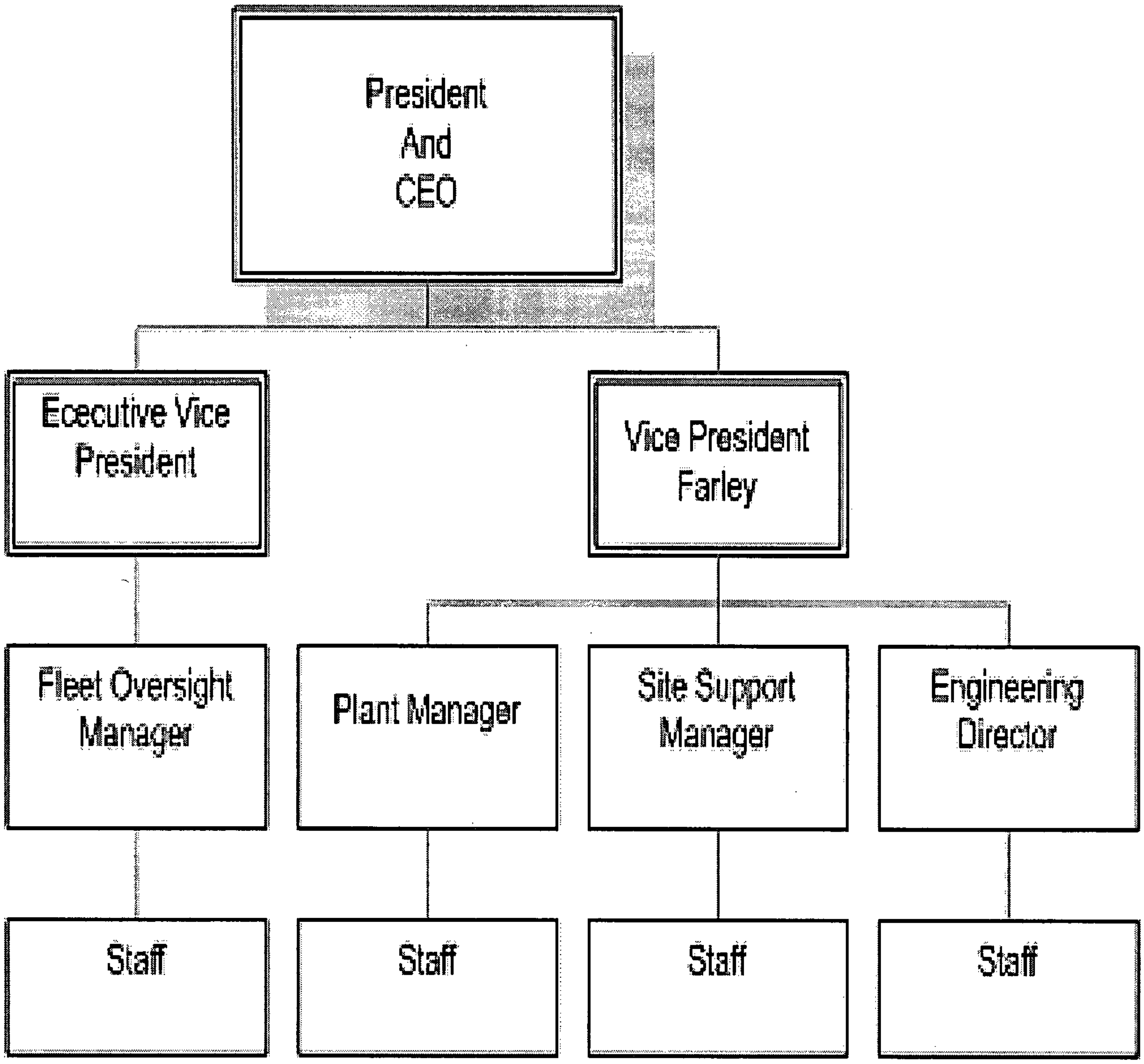

FARLEY NORMAL ORGANIZATION

FIGURE 6

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Figure 7

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FIGURE 8

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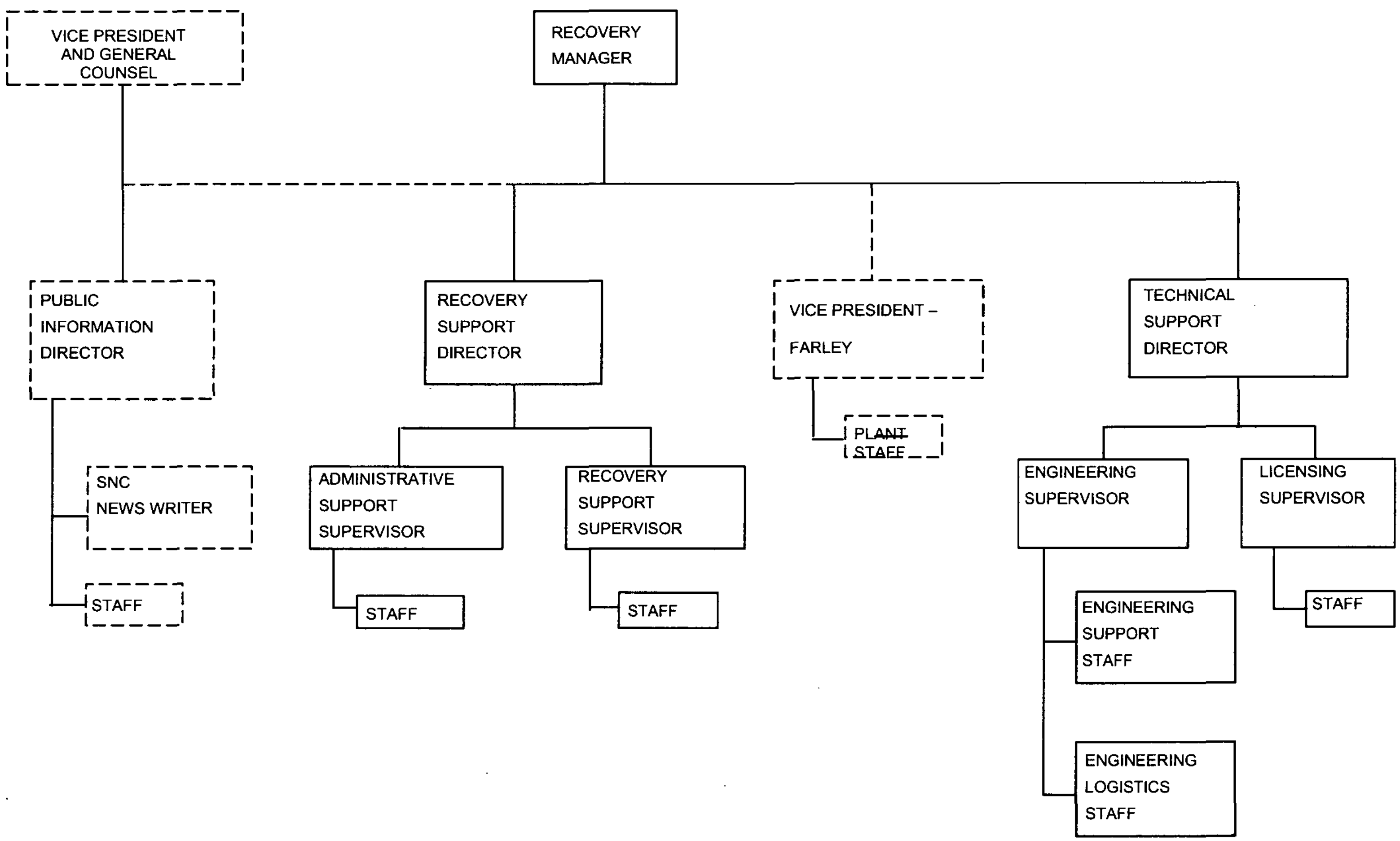
Figure 9



EMERGENCY OPERATIONS FACILITY RECOVERY ORGANIZATION

Figure 10

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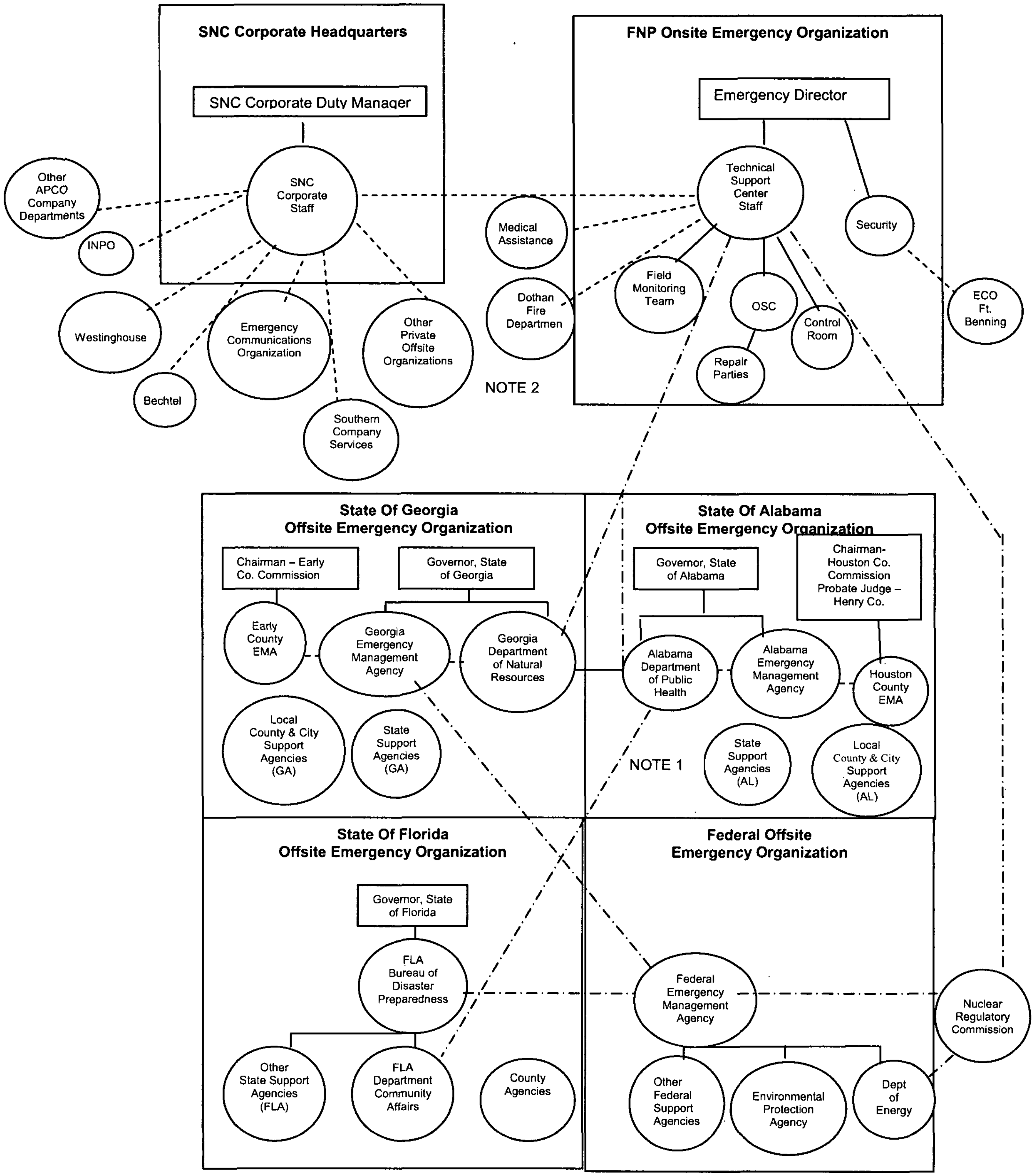
Figure 11



LEGEND:

Individual

Organization

Control

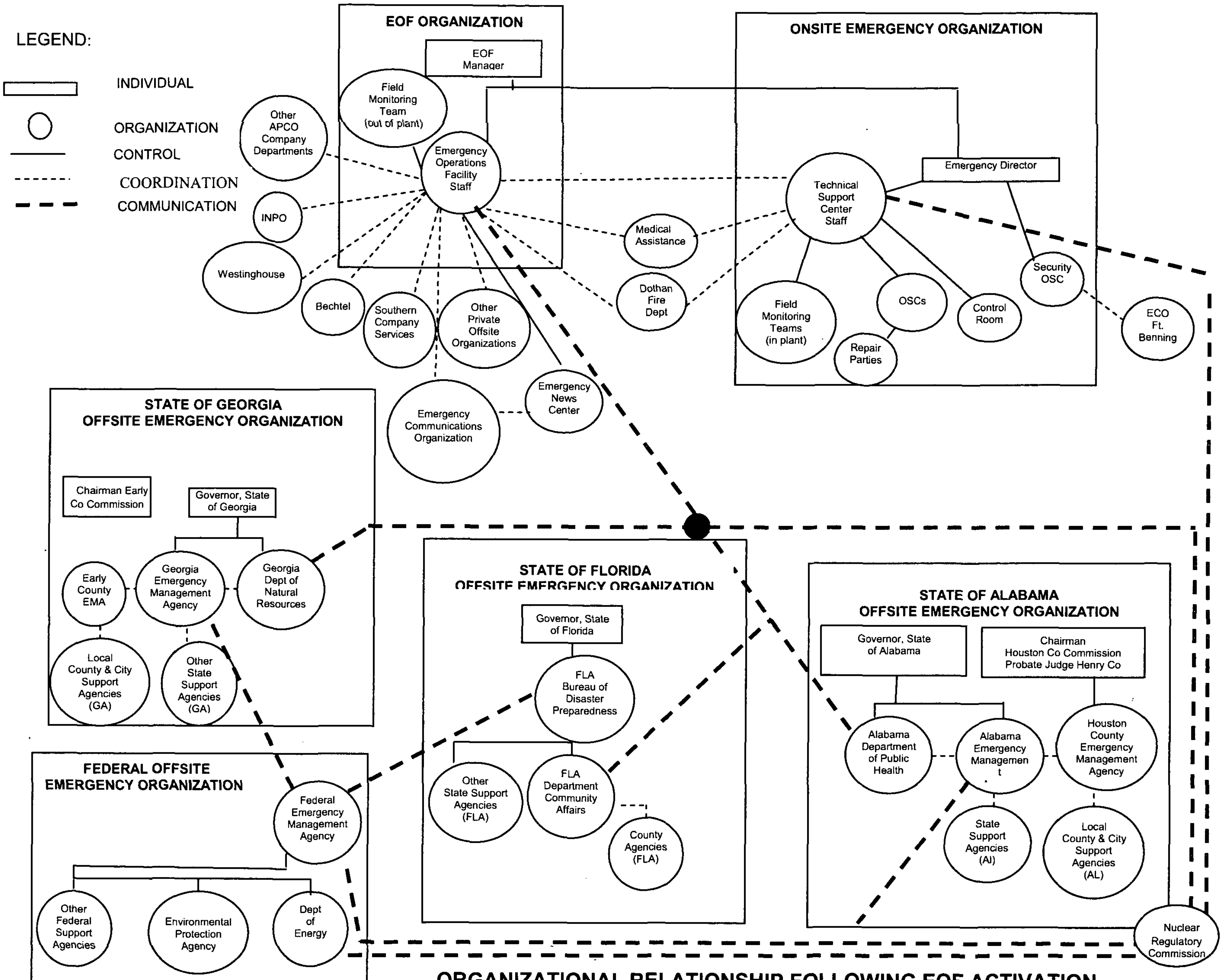
Coordination

Communication

Note 1: By mutual agreement, Alabama Department of Public Health communicates with Fla. Department of Community affairs (see V.I.A.). If appropriate, communication will be made directly to all ENN locations (see 11.B.11)

Note 2: Onsite emergency organization will communicate directly with private support organizations if deemed necessary by Emergency Director.

ORGANIZATONAL RELATIONSHIP PRIOR TO EOF ACTIVATION
Figure 12



ORGANIZATIONAL RELATIONSHIP FOLLOWING EOF ACTIVATION

Figure 13

III. FACILITIES AND EQUIPMENT

A. CONTROL CENTERS

Principal Southern Nuclear Operating Company emergency facilities and their functions are described individually below. Figures 12 and 13 illustrate the interfaces between the functional activities associated with each facility and state, local, federal and private organizations.

1. Technical Support Center (TSC)

During any emergency condition the center for coordinating all in-plant activities will be the TSC.

Located immediately north of the Unit 2 control room area, the TSC is designed to accommodate up to 25 people for the evaluation of plant status, coordination of damage assessment and emergency actions, and interface with the NRC, Emergency Operations Facility (EOF) and Operations Support Center (OSC). Provision is also made for control and coordination of communications with offsite agencies and of out-of-plant radiation monitoring activities until the EOF is activated and assumes these functions. The TSC when activated will normally maintain the function of offsite communications for initial and upgrade notifications to federal, state, and local authorities. An overall space of 22 feet x 65 feet, with a 9-foot ceiling height, has been provided. Room layout is as follows:

a. Monitoring Area - Two dedicated Integrated Plant Computer (IPC) terminals are provided for the TSC staff to obtain detailed operational information from either the Unit 1 or Unit 2 IPC to include various plant parameters, radiological data, meteorological data and automated dose assessment as well as providing the ability to activate ERDS. In addition to the dedicated IPC terminals the monitoring area includes numerous LAN based personal computers which can also provide the TSC staff with Unit 1 or Unit 2 IPC access as well as providing access to the web based manual dose assessment program.

b. Planning and Coordination Area - Includes desks, reference tables, and files for plant procedures and manuals. Phones are provided for full communication capability. Two tables and FTS communication systems are designated for NRC use.

c. Document Room - Includes files, drawings, data sheets, and indexes.

d. Conference Area - Includes a conference table and chalk board/projection screen. Communications cabinets contain two-way radio, telephone, Emergency Notification Network and NRC Emergency Notification System/NRC HPN phone facilities. An intercom, sound powered headphones and a telecopier are also provided.

Figure 14 shows the above layout.

The TSC is designed to be habitable to the same extent as the control room for postulated radiological accidents. Its ventilation system includes a deep-bed charcoal filter to remove air-borne contamination, and it has the capability of pressurizing the TSC area and recirculating the room air through the charcoal filter. A permanent radiation monitor is provided to continuously indicate radiation dose rates and airborne activity. A radiation alarm in the main control room make-up air supply duct automatically initiates room pressurization and recirculation. Electrical power sources are such that the HVAC, wall outlets and lighting can be powered from the diesel generators if offsite power is lost.

The TSC contains a set of piping and instrumentation drawings for each unit and technical manuals on selected major equipment. Other technical data are readily available from the document control facility in the plant Service Building which may be reached by intra-plant phone from the TSC. Also available in the TSC are the Emergency Plan, Emergency Plan Implementing Procedures, Abnormal Operating Procedures, Emergency Response Procedures, Severe Accident Management Guidelines, and Unit Operating Procedures along with other general reference material. Should the emergency situation so dictate, the Emergency Director may shift the staff to other locations as designated by the Emergency Director.

2. Emergency Operations Facility (EOF)

The EOF facilities and equipment are described in Appendix 7(G).

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3. NRC Support Facilities

Support facilities for the NRC have been provided at the Site Training Facility. Adequate functional working space and telecommunication capability for up to 10 people (approximately 750 ft^2) has been provided in this near-site facility.

4. Operations Support Center (OSC)

The Breakroom (outside the Technical Support Center) will serve as the Operations Support Center (Figure 19), from which emergency operations support will be provided. In the event that the Operations Support Center becomes untenable, it will be relocated onsite or to offsite company facilities in Headland, Webb or Ashford, Alabama (Figure 17) at the discretion of the Emergency Director.

5. Emergency News Center

The Houston County Juvenile Court Services Building (Figure 17) will serve as a working and briefing center for local, state and national news media (Lease Agreement – Appendix 2(B)). All official information released by SNC and APC regarding the emergency will be released from the Emergency News Center once it has been activated.

6. APC Corporate Media Center (CMC)

The APC Corporate Media Center will be staffed by the Emergency Communication Organization and serve as the coordination point for APC corporate public information support.

B. COMMUNICATIONS SYSTEMS

Several modes of communication are available, during both normal and emergency conditions, to transmit and receive information within the plant and at locations onsite and offsite.

1. Commercial Telephones

The commercial telephone lines consist of several lines connected through local exchanges to the Bell Telephone system. Access to these lines is available through selected private automatic exchange (PAX) telephones located throughout the plant, including the control room, TSC, and Emergency News Center. Commercial telephone lines servicing the Corporate Office may be accessed through off-premises extensions (OPX) of the Corporate Office PAX which are located in selected plant locations, including the TSC, and in the EOF. Availability of OPX and PAX telephones capable of accessing commercial telephone lines is tabulated in Table 1 Commercial telephone.

lines are also available at the Birmingham EOF and the Birmingham Corporate Communication Offices. A facility minimum of thirty (30) commercial telephone lines are available at the Emergency News Center.

2. Private Automatic Exchange

The plant private automatic exchange (PAX) consists of a network of telephones located strategically throughout the plant, at various stations on the site (including the Control Room, TSC and OSC) and at selected offsite locations Emergency News Center, the State of Alabama Forward Emergency Operations Center in Houston County, the State of Georgia Forward Emergency Operations Center in Early County, the AEMA EOC in Clanton, Alabama, the ARCD EOC in Montgomery, Alabama, and the GEMA EOC in Atlanta, Georgia. Selected PAX phones are capable of communication with similar private automatic exchanges at the Corporate Office, other APC/SNC facilities, and facilities of Southern Company affiliates (e.g. Southern Company Services and Georgia Power Company).

In addition to the PAX network, selected phones operate as off-premises extensions (OPX) of the APC Corporate Headquarters private automatic exchange and operate independently of the plant PAX system. These phones may be used for calling APC/SNC facilities and offices connected to the APC Corporate Headquarters PAX system or for accessing Bell Telephone System commercial lines in Birmingham. OPX and PAX phone availability is tabulated in Table 1.

3. Microwave

APC's microwave system provides telephone circuits to all of the company's power plants and major offices including the Alabama Power Office in Headland, Alabama. All primary microwave routes are provided with standby RF equipment with automatic switchover. The microwave telephone circuits available may be used by dialing through the PAX system.

4. Alabama Control Center (ACC) Link

A computer link to the Alabama Control Center network is located in the Switchhouse. The link provides for communications with the ACC for purposes of load dispatch and coordination with the Southern Company Power Control Center and other APC plants.

5. Two-Way Radio

Two-way radios and base stations are available at the site as follows:

a. Plant operations frequency -

This radio frequency provides communication between the Control Room, TSC, EOF, and personnel in the plant equipped with operations frequency radios. This frequency may be used as a backup frequency for communicating with offsite/onsite field monitoring teams.

b. Plant security frequency -

This radio frequency provides communication between the Control Room, TSC, EOF, Security Offices, mobile units in security vehicles and other selected company owned vehicles and personnel equipped with security frequency walkie-talkies.

c. Plant field monitoring frequency -

This radio frequency provides communication between the TSC, EOF, and personnel in the plant equipped with FMT frequency radios. This frequency may be used as a backup for communicating with offsite/onsite field monitoring teams.

d. Digital radio system (multi frequency) -

This radio system provides both onsite/offsite group and private radio communication. This radio system will be the normal communication system for the field monitoring teams.

6. Public Address and Party Lines

A plant wide public address system consisting of six separate and independent communications lines (one page and five party lines) exists to provide quick communications between two or more locations, even in high noise level areas. The page channel is used to call personnel over the speakers, issue plant-wide instructions or to communicate between two or more hand-sets. The party lines are used to carry on communication after the paged party has answered. One of the party lines will be dedicated as an emergency communications channel during emergency conditions.

7. Sound Powered Telephone

Sound powered telephone lines are located between critical points in the plant and are normally used primarily for communications during maintenance and refueling.

8. Plant Emergency Alarm

The Plant Emergency Alarm is a variable tone alarm. The warble tone may be used to alert plant personnel, contractors, and visitors onsite in the event of a Site Area Emergency or General Emergency or other condition requiring all personnel to report to their emergency assembly areas. The siren tone may be used to muster the fire brigade or at the discretion of the Shift Supervisor in order to alert personnel. Blue beacon lights located in high noise areas or other locations where the alarms may not be audible are also activated to provide a visual emergency notification.

9. NRC Emergency Notification System (ENS)

This dedicated Federal Telephone System (FTS) communications line provides a dialup communications link to the NRC operations office in Bethesda, MD and would be used for continuous communications in the event of an emergency. Phones are located in the control room, TSC, EOF, and in the Shift Foreman's office adjacent to the Control Room.

10. NRC Health Physics Network (HPN)

This dedicated Federal Telephone System (FTS) communications line provides a dialup communications link with the NRC to provide radiological information. Phones are located in the TSC and in the EOF.

11. State/Local Agency Emergency Notification Network (ENN)

This communications system provides an immediate communications link with the State of Alabama, the State of Georgia and local county personnel in Alabama and Georgia who would possibly be notified in the event of an emergency. Telephones with speakers on this communication network are located at the EOF; TSC; Shift Foreman's Office adjacent to the control room; Alabama Radiation Control Division; Alabama Emergency Management Agency; State of Alabama Department of Public Safety; Houston County (AL) Sheriff's Dispatcher; Houston County Office of Radiological Health; Georgia Emergency Management Agency (GEMA); Early County (GA) Sheriff's Dispatcher; Early County Emergency Management Agency; and GEMA Forward Emergency Operations Center (Early County). The communications system locations listed above for the FNP Shift Support Supervisor's Office; the Alabama Department of Public Safety, the Georgia Emergency Management Agency, the Houston County Sheriff's Dispatcher's Office, and the Early County Sheriff's Dispatcher's Office are staffed 24 hours a day.

12. NRC Reactor Safety Counterpart Link (RSCL)

This dedicated FTS communications line provides a dialup communications link for the NRC to conduct internal NRC discussions on plant equipment conditions separate from the licensee. Phones are located in the TSC and EOF.

13. Protective Measures Counterpart Link (PMCL)

This dedicated FTS communications line provides a dialup communications link for the NRC to conduct internal NRC discussions on radiological releases, meteorological conditions, and the need for protective actions. Phones are located in the TSC and EOF.

14. Management Counterpart Link (MCL)

This dedicated FTS communications line provides a dialup communications link for any NRC internal discussions between the NRC Executive Team Director or Executive Team members and the NRC Director of Site Operations or top level licensee management at the site. Phones are located in the TSC and EOF.

15. Local Area Network (LAN) Access

This dedicated FTS communications line provides the NRC site team with access to the NRC Operations Center's LAN. Connections are provided in the TSC and EOF.

16. Telecopier

Telecopiers are located at the TSC, EOF, Alabama Radiation Control Division, Alabama Emergency Management Agency, GEMA, Houston County Emergency Management Agency, and Early County Emergency Management Agency.

17. SNC Integrated Data Display System

This system provides a direct data link via the internet between Farley Nuclear Plant and at Houston County Emergency Management Agency (EMA), Alabama Radiation Control Division in Montgomery, Georgia EMA in Atlanta, Early County EMA, and the EOF. It may be used to rapidly transmit information on current emergency classification, radiological conditions, and meteorological conditions.

18. Emergency Response Data System (ERDS)

These dedicated FTS communications lines provide channels by which raw reactor parametric data is transmitted from the site to the NRC. The affected Unit ERDS will be activated within one hour following the declaration of an Alert emergency or above.

19. Other Communication Systems

A cellular phone is provided for use by the EOF Manager while in transit to the EOF.

C. ASSESSMENT FACILITIES

In order to carry out the assessment actions described in Section IV, facilities must be available for initial as well as continuous evaluation of emergency conditions.

1. Onsite Systems and Equipment

a. Natural Phenomena Monitors

The plant is equipped with both primary and backup meteorological towers instrumented as shown in Table 2. The primary tower provides input to a recorder in the control room which records wind speed (35 ft. or 150 ft. elevation), wind direction (35 ft. or 150 ft. elevation) and lapse rate (selectable between redundant 200 ft. - 35 ft. channels). The primary tower feeds lapse rate data and both towers feed wind speed, wind direction, sigma theta and sigma phi data to the plant computer utilized for dose calculations. Computer terminals in the TSC and EOF can be utilized to obtain real time or 15 minute average readouts of meteorological data. Should the plant's meteorological equipment become inoperable, information is available from the approved Flight Service, from the Georgia Pacific Paper Company or from the regional National Weather Service offices.

Various types of seismic instrumentation are located on vital pieces of equipment and structures throughout the site, a number of which have readout and/or annunciation in the control room. A complete discussion of these monitors is given in FSAR Section 3.7.4. Seismic information may also be obtained from the National Earthquake Center in Golden, Colorado.

The plant is equipped with hydrologic monitors to monitor river water level and service water pond level. These monitors have readout and annunciation in the control room. Redundant river water level monitors provide control room indication from 65 to 130 feet MSL river level. A discussion of service water pond level monitors is given in FSAR Section 9.2.1.5.

b. Radiological Monitors

Portable monitors and sampling equipment used during normal plant operations are available in the Health Physics Instrument Issue Room on elevation 155 of the auxiliary building for use during emergencies. Portable monitors and/or sampling equipment designated for emergency use are located in various areas of the plant. A general category listing of emergency supplies and equipment is included in Appendix 1(A) and an itemized listing can be found in FNP-0-EIP-16, "Emergency Equipment and Supplies".

Process, area and effluent monitors that may be used for emergency assessment are described in Appendix 3(C). A complete discussion of these monitors is given in FSAR Sections 11.4 and 12.1.4. Monitors on gaseous effluent release points provide input signals to a plant computer utilized for offsite dose calculations; computer terminals in the TSC and EOF can be utilized to obtain one minute or 15 minute average effluent activity data. FNP-0-EIP-30, "Post Accident Core Damage Assessment", provides correlations between containment high range area monitor readings and core damage.

c. Post Accident Sampling Facilities

Facilities are provided for obtaining highly radioactive samples while minimizing personnel exposure. Reactor coolant samples, both pressurized (RCS) and unpressurized (RHR/containment sump) may be obtained utilizing a remotely operated sampling panel. The panel provides for obtaining samples of both liquid phase and non-condensable gas phase components. Particulate, iodine and noble gas samples may be obtained from the containment atmosphere or the plant vent stack utilizing remotely operated valves. All systems provide for collection of small aliquots of the sampled media. Sampling capability also exists for the steam generators and steam jet air ejectors. Shielded containers, portable shielding and remote handling apparati allow analysis with minimum exposure.

d. Fire Detection

Fire and smoke detection monitors are located in all vital buildings on the plant site with extensive coverage in the Auxiliary Building, Containment and Turbine Building. A complete description of the fire protection and detection systems is given in FSAR Section 9.5, and fire protection re-evaluation report entitled, "Farley Nuclear Plant Fire Protection Program Re-evaluation".

2. Environs Monitoring Facilities and Equipment

A comprehensive environmental monitoring program is established for the Farley Plant covering both onsite and offsite areas. Equipment used in this program that may be used for emergency assessment is as follows:

a. TLDs

b. Air particulate and iodine monitors

c. Portable radiation survey instruments

Although the TLDs and the air particulate and iodine samples may be evaluated by an outside vendor, the capability for evaluating the air particulate and iodine samples exists at the plant. FNP-0-RCP-25 provides methodology for utilizing available air sampling and monitoring equipment to measure radioiodine concentrations in air in the plume exposure EPZ as low as 10-7 uCi/ml under field conditions. Interference from noble gas and background radiation will not decrease the minimum detectable activity. A detailed description of the minimum portable and fixed health physics equipment available at the site is given in FSAR Section 12.3. Predesignated monitoring and sampling points are listed in FNP-0-EIP-4, "Health Physics Support to the Emergency Plan".

The states of Georgia and Florida have mobile laboratory facilities that could be used in case of emergencies. All field monitoring data will be transmitted to and analyzed at the EOF (the TSC until the EOF is staffed). The University of Georgia and Oak Ridge National Laboratories have fixed radiological laboratories in the general geographic area that can aid in radiological analysis. It is estimated that the response time for these organizations will range from 2 to 4 hours.

The plant is equipped with a computer which utilizes automatically input meteorological data, effluent monitor data and selected plant parameter data (e.g. steam generator pressure, plant vent stack flow rate, etc.) to calculate estimated and projected offsite dose. The system automatically actuates when effluent monitors indicate abnormal release point activity and continues until manually terminated. Calculational results are available at computer terminals located at the TSC, EOF and other selected locations.

In the event that the above computer is not available and for long term dose assessment, a manual personal computer method is provided in FNP-0-EIP-9.3, "Personal Computer - Automated Dose Assessment Method". The system calculates estimated and projected offsite dose, and plume dimensions, location and arrival times out to 50 miles from the plant site. Meteorological data, effluent monitor data and plant parameter data utilized in the manual calculations will usually be obtained from local data systems. In the event that the local data systems are not available then data may be obtained from the control room meteorological data recorder, effluent monitor instruments and control room indicators.

A detailed discussion of the automatic offsite dose assessment method is provided in FNP-0-M-007, "Emergency Dose Calculation Manual". A detailed discussion of the manual offsite dose assessment method is provided in the MIDAS (Meteorological Information and Dose Assessment System) Technical Manual.

Results of dose estimates and projections are provided to off-site agencies responsible for initiating protective actions using the SNC Integrated Data Display System, telecopy system, ENN, ENS and/or commercial telephones.

3. Personnel Monitoring Equipment

In addition to the portable radiological monitors discussed in Section III.C.1.b external dosimetry equipment is available for personnel monitoring and dose assessment. Digital alarming dosimeters (DADs) provide immediate dose assessment for emergency personnel. Dose assessment will also be provided by plant TLDs and vendor TLDs which can be processed on an emergency basis within 24 hours. All dose results will be retained in permanent records for each individual.

D. PROTECTION, DECONTAMINATION AND FIRST AID FACILITIES

1. Protective Facilities and Equipment

The Plant Assembly Areas are designated as the Control Room, Technical Support Center (TSC), Operations Support Center (Breakroom outside TSC), Service Building Auditorium, Service Building Maintenance Shop, Central Security Control (CSC) Building, Training Center Breakroom, Switchhouse, Fabrication Shop, and Warehouse Receiving Area (Figure 19). All personnel on the plant site will report to one of these designated assembly areas when the Plant Emergency Alarm is sounded. All personnel will be instructed in advance as to which assembly area to report in the event that the Plant Emergency Alarm is sounded.

Alternate Assembly Areas designated for use at the discretion of the Emergency Director are the Parking Lot South of Service Building, Contractor Parking Lot, Switchhouse Parking Lot, an area between the Unit #2, 2A, and 2B Cooling Towers, the Utility Building, the Southeast corner of the Control Room, the Employee Parking Lot, the Breakroom near the Primary Access Point (PAP), the Health Physics (HP) Office, and Outage Support Building (OSB)(Figure 19).

The Plant Assembly Areas shall serve as the protective facilities. The control room will provide protection for Operations personnel, and is designed to 10CFR50 Appendix 1(A), criteria 19 as described in FSAR section 3.1.15. Control room protective equipment is listed in Appendix 1(A) of the plan.

The Operations Support Center will provide protection for emergency Operations, Health Physics and Repair Party personnel. An emergency cabinet is provided which contains emergency supplies.

The Maintenance Shop will provide protection for Emergency Repair Party personnel. An emergency cabinet is provided which contains emergency supplies.

Central Security Control will provide protection for the security support personnel. An emergency cabinet is provided which contains emergency supplies.

The Service Building Auditorium will provide for assembly of engineering and administrative personnel. No protective equipment is provided for this facility; however, if required, all non-essential personnel will be evacuated to a safe location.

Contractor personnel assigned to Plant Modification and Maintenance Support (PMMS), Support Building administrative/engineering personnel, and PMMS personnel will assemble in the Fabrication Shop. After accountability, these personnel will be evacuated if necessary.

Training Center personnel and personnel in training will assemble in the break area.

If necessary, Alternate Assembly Areas will be utilized to conduct accountability and non-essential personnel will be evacuated from the plant site. In the event that the Maintenance Shop, Service Building, and CSC become untenable due to accident conditions, the Switchhouse and/or Training Center will become the alternate shelter(s). Protective equipment for these locations is listed in Appendix 1(A). Under extreme conditions, APCo facilities that may be used as a personnel staging area are available approximately eight miles from the plant site.

2. Decontamination and First Aid

A first aid station and a decontamination area are located on the plant site. The decontamination area is located in the Auxiliary Building at elevation 155 near the Health Physics Office. The first aid station is located in the Auxiliary Building at elevation 155 and a Nurses Station is located in the Training/Visitors Center. Personnel decontamination and first aid supplies are provided for each of the two areas. Stretchers and first aid kits are located strategically throughout the plant. There is at least one person on each shift qualified to perform first aid. Plant employees are considered to be first aid qualified upon successful completion of the Company's First Aid Course and are required to be requalified within three years.

3. Medical Transportation

a. Local Rescue Squads

Ashford Rescue Squad has agreed to transport contaminated and/or irradiated casualties from the plant site to Southeast Alabama Medical Center (SAMC) in Dothan, Alabama.

Columbia Rescue Squad has agreed to transport contaminated and/or irradiated casualties from the plant site to Southeast Alabama Medical Center (SAMC).

b. Dothan Ambulance Service (Pilchers Ambulance Service), Inc.

Dothan Ambulance Service, Inc. has agreed to transport contaminated and/or irradiated casualties from the plant site to SAMC, University of Alabama Hospital in Birmingham, Alabama or Radiation Emergency Assistance Center Training Site (REAC/TS) of Oak Ridge Institute for Science and Education (ORISE) in Oak Ridge, Tennessee.

c. American Medical Response Ambulance Service

The American Medical Response in Birmingham, Alabama, has agreed to transport contaminated and/or irradiated casualties once they arrive in Birmingham to the University of Alabama
Hospital.

4.Medical Treatment:

The detailed plans for the handling and care of injured personnel potentially contaminated and/or highly irradiated are contained in Part II, Medical Plan and FNP-0-EIP-11, "Handling of Injured Personnel". A brief description of the facilities and services available for medical support is given below. Letters of agreement on file from these facilities are found in Part II, Appendix 2(B).

a. Southeast Alabama Medical Center

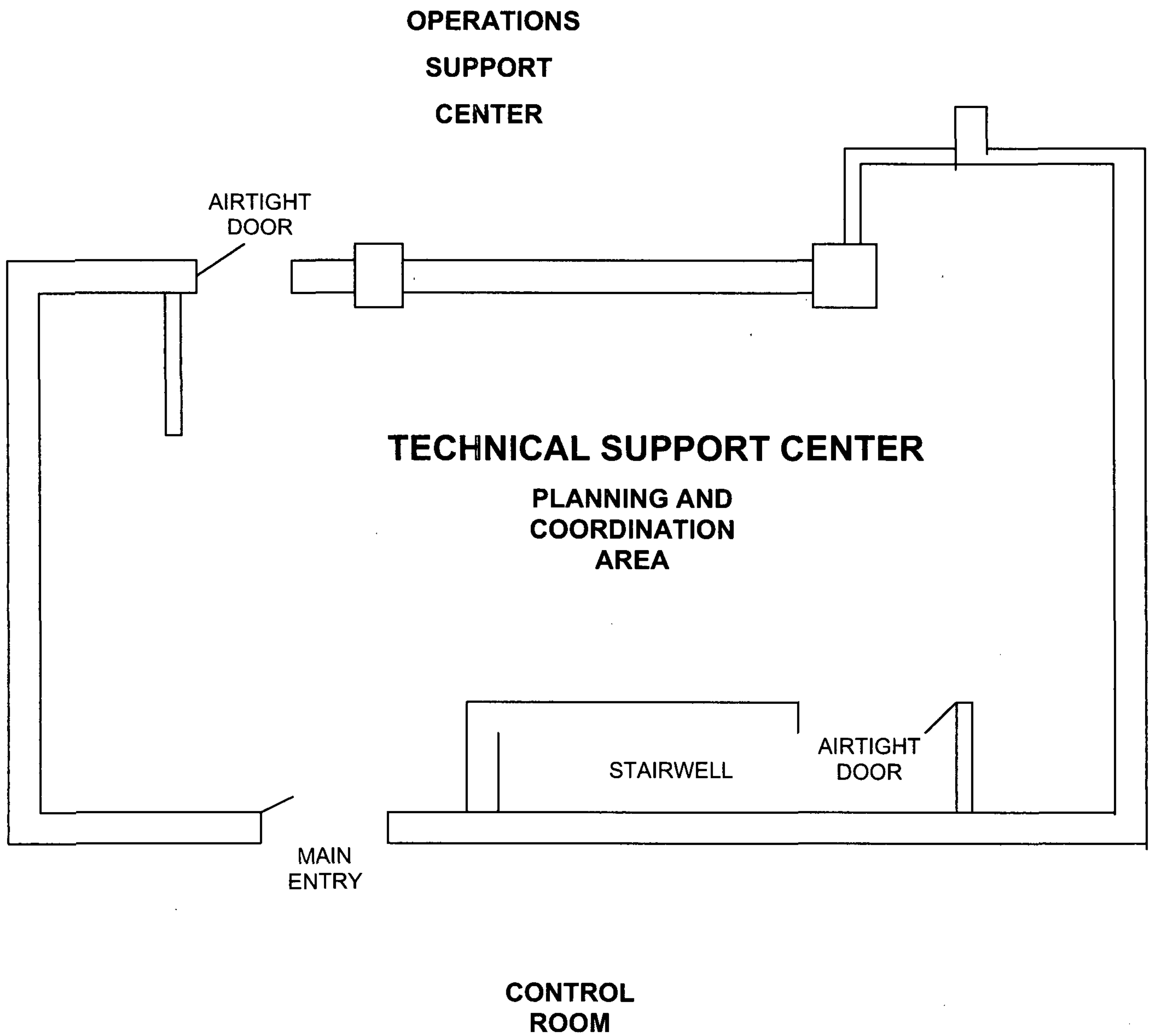
The Southeast Alabama Medical Center in Dothan, Alabama, has agreed to receive and care for injured personnel that may be contaminated or irradiated. In addition to routine medical care, space has been provided for a decontamination and emergency treatment facility and for storage of emergency medical equipment, monitoring equipment and dosimeters. Entrance to this facility will not affect the use of the hospital emergency room.

b. University of Alabama Hospital

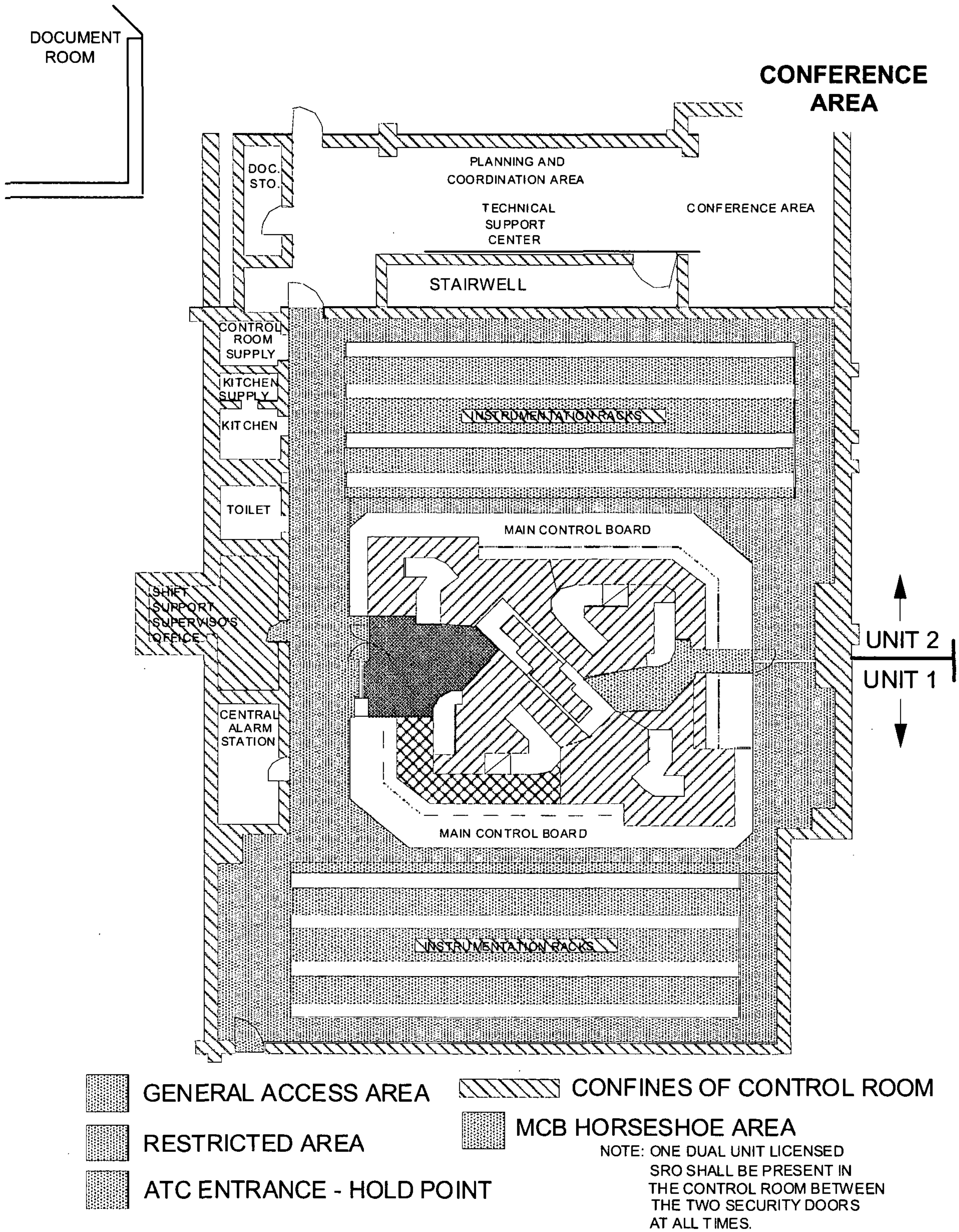
The Division of Oncology of the University of Alabama Hospital in Birmingham, Alabama, has agreed to provide, on a priority basis, definitive care for irradiated and/or contaminated casualties. An area of the hospital has been modified to provide for such radiological emergencies. At the physicians discretion, persons who have been exposed may be sent to the University of Alabama Medical Center after receiving treatment at the Southeast Alabama Medical Center.

c. Oak Ridge Institute for Science and Education - REAC/TS

The Oak Ridge Institute for Science and Education-REAC/TS team at Oak Ridge, Tennessee, has agreed to accept any type of radiation accident victim in need of hospitalization. At the physicians
discretion, persons who have been exposed may be sent to ORISE-REAC/TS after receiving treatment at the Southeast Alabama Medical Center.



TECHNICAL SUPPORT CENTER
Figure 14



CONTROL ROOM AND TECHNICAL SUPPORT CENTER

FIGURE 15

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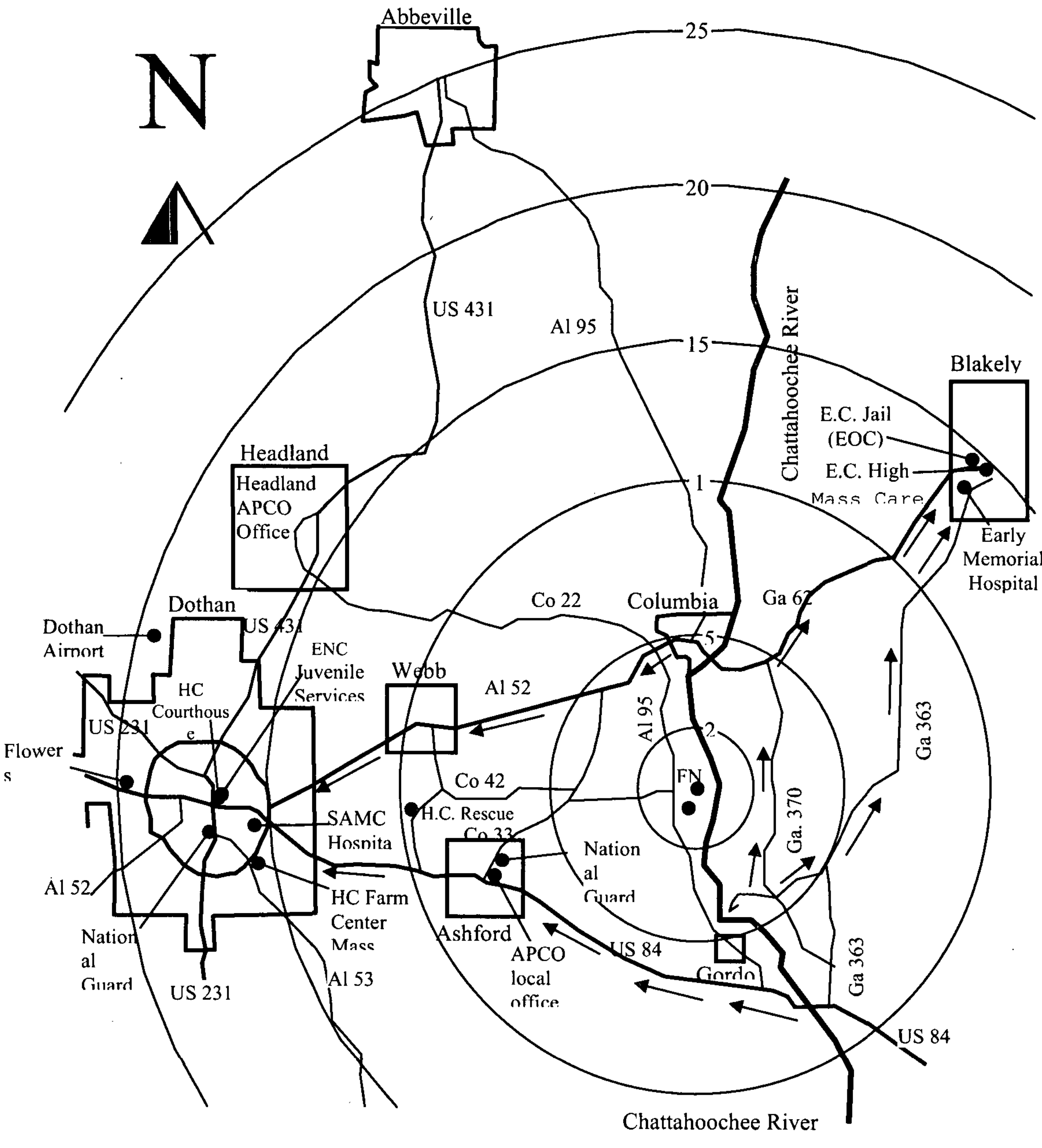
FIGURE 16



SITE AREA EMERGENCY FACILITIES, GENERAL POPULATION SUPPORT SERVICES AND EVACUATION ROUTES

Figure 17

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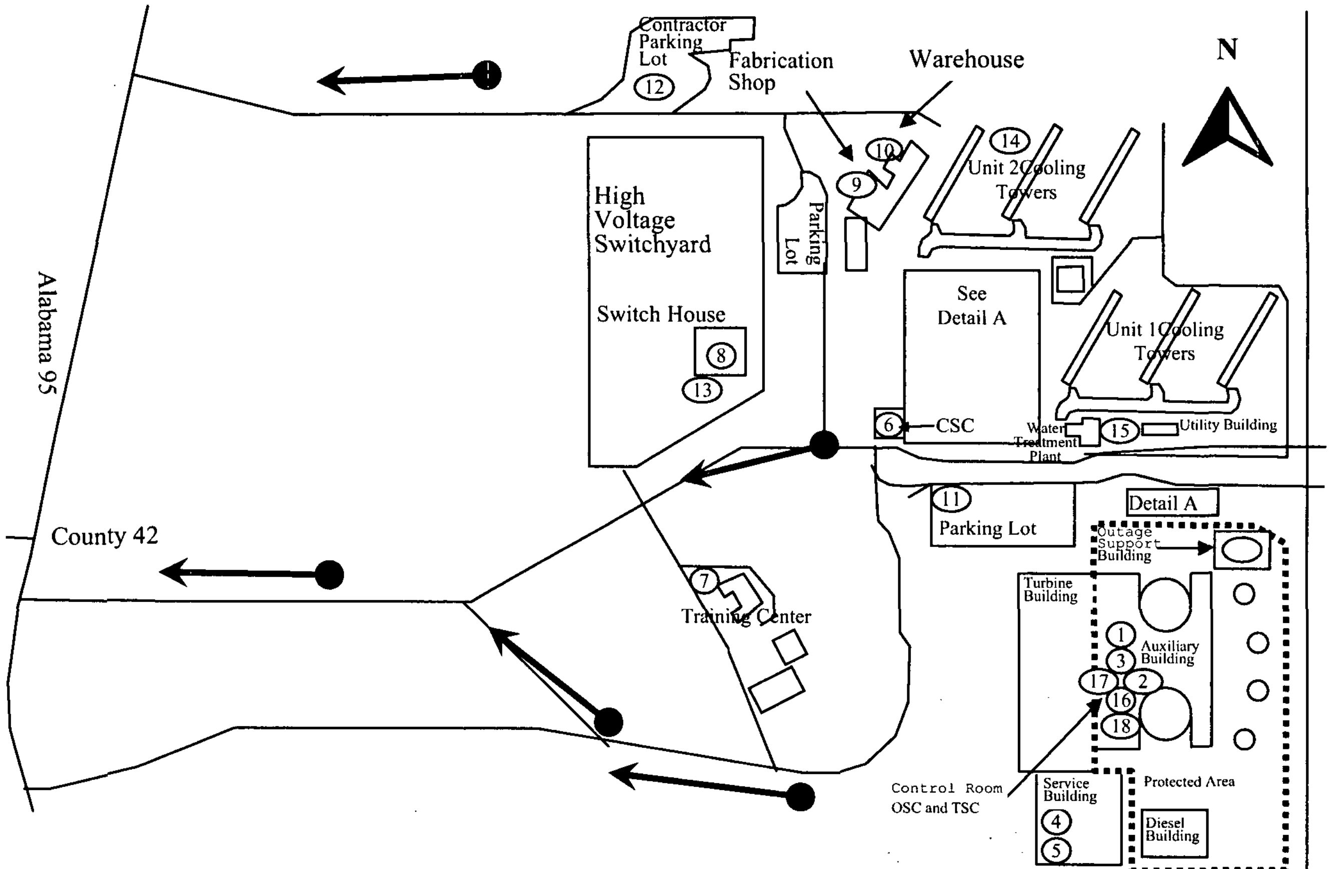
Figure 18



LEGEND

OPERATION SUPPORT CENTER

1 BREAKROOM OUTSIDE TSC

ASSEMBLY AREAS

2 CONTROL ROOM
3 TECHNICAL SUPPORT CENTER (TSC)
4 SERVICE BUILDING AUDITORIUM
5 MAINTENANCE SHOP
6 CENTRAL SECURITY CONTROL (CSC)
7 TRAINING CENTER BREAKROOM
8 SWITCH HOUSE
9 FABRICATION SHOP
10 WAREHOUSE RECEIVING AREA

ALTERNATE ASSEMBLY AREAS

11 PARKING LOT SOUTH OF S.B.
12 CONTRACTOR PARKING LOT
13 SWITCHHOUSE PARKING LOT
14 BETWEEN 2A & 2B COOLING TOWERS

15 UTILITY BUILDING
16 SE CORNER OF CONTROL ROOM
17 OPS READY ROOM
18 HP OFFICE AREA

EVACUATION ROUTES

ONSITE EVACUATION ROUTES, ASSEMBLY AREAS AND OPERATIONS SUPPORT CENTER

FIGURE 19

COMMUNICATIONS EQUIPMENT AVAILABILITY

LOCATION	Commercial Telephone Lines	PAX Telephone	General Office Lines	Plant Intercom	TSC – EOF- OSC Bridge	Security Two-Way Radio	Operations Two-Way Radio	ENN – Emergency Notification Network	NRC-(ENS) Emergency Notification System	NRC-(HPN) HP Network	NRC – RSCL, PMCL, MCL, LAN	RMT Two-Way Radio
Technical Support Center	*	X	X *	X	X	X	X	X	X	X	X	X
Shift Foremans Office	*	X	*	X	X		X	X	X			
Control Room	*	X	*	X	X	X	X		X			
Emergency Operations Facility	X		X		X	X	X	X	X	X	X	X
Emergency News Center	X * +	X	* +		X							
Assembly Areas	*	X	*	*	X							
Operations Support Center	*	X	*	X	X							

X Directly available
* Accessible through the FNP PAX system
+ Accessible through the District Office PAX system

TABLE 1

EMERGENCY FACILITY COMMUNICATIONS CAPABILITY

METEOROLOGICAL INSTRUMENTATION AT THE FARLEY SITE
PRIMARY TOWER

Approximate Height Above Tower Base (ft.)	Sensed Parameter	Recorded Parameter
Ground	Rainfall	Rainfall
Ground	Solar radiation	Solar radiation
35'	Wind speed	Wind speed (0-50 mph)
35'	Wind direction	Wind direction
35'	Horizontal and Vertical Angle	Horizontal and Vertical Wind Angle (Bivane)
35'	Dew Point	Dew Point
35'	Temperature	ΔT (T200-T35) Primary
35'	Temperature	ΔT (T200-T35) Secondary
35'	Temperature	ΔT (T200-T35) Tertiary
150'	Horizontal and Vertical Angle	Horizontal and Vertical Wind Angle (Bivane)
150'	Wind direction	Wind direction
150'	Wind speed	Wind speed (0-150 mph)
200'	Temperature	ΔT (T200-T35) Primary
200'	Temperature	ΔT (T200-T35) Secondary
200'	Temperature	ΔT (T200-T35) Tertiary

TABLE 2
PAGE 1 OF 2

BACKUP TOWER

Approximate Height Above Tower Base (ft.)	Sensed Parameter	Recorded Parameter
35'	Wind speed	Wind speed (0-25 mph)
35'	Wind direction	Wind direction
35'	Horizontal and Vertical Angle	Horizontal and Vertical Wind Angle (Bivane)
35'	Ambient Temperature	Temperature (-50 C - +50 C)

TABLE 2
PAGE 2 OF 2

IV. ASSESSMENT ACTIONS AND PROTECTIVE MEASURES

A. CLASSIFICATION OF EMERGENCIES

CLASSIFICATION OF EMERGENCIES IS DESCRIBED IN APPENDIX 11(k)

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B. POST ACCIDENT ASSESSMENT ACTIONS

Effective coordination and direction of all elements of the emergency organization require continuing assessment through the duration of the emergency situation. In addition to continued monitoring of control room instrumentation and plant parameters, some special assessment actions are, initiated if appropriate. These assessment functions are identified below:

1. Reactor Coolant Sampling, Containment Atmosphere Sampling and Plant Vent Stack Sampling.

   RCS, containment atmosphere and/or plant vent stack samples will be taken and analyzed to assess the severity of core damage and the potential radiological consequences. The detailed sampling procedures for each area are provided in FNP-0-CCP-1300, "Chemistry and Environmental Activities During a Radiological Accident". FNP-0-EIP-30 "Post Accident Core Damage Assessment" provides a method to estimate the extent of core damage utilizing various plant monitor readings.

2. Surveillance of Control Room Monitors

   Surveillance of radiological and meteorological monitors in the control room is primarily the responsibility of operations personnel. However, in the event that offsite assessments based on this data are necessary, an individual designated by the Emergency Director will maintain surveillance over effluent monitor readings and dose projections, periodically reporting them to those designated in FNP-0-EIP-6, "TSC Setup and Activation". If the dose assessment computer is inoperable, the designated individual will periodically log the monitor values.

3. In-Plant and Site Surveys

   During emergency conditions in-plant, site and site boundary surveys will be performed as appropriate by the Field Monitoring Team as described in FNP-0-EIP-4, "Health Physics Support to the Emergency Plan". The Field Monitoring Team will be capable of sampling under field conditions and will be capable of measuring radioiodine in the presence of noble gas and background radiation to as low as 5×10^{-8} uCi/cc.

4. Population Exposure

Exposure projections shall be periodically estimated in the affected sectors utilizing projected dose and measured dose rates. The Dose Assessment Supervisor will work with the state/local agency representatives to determine the Total Effective Dose Equivalent (TEDE) exposure (resulting from external exposure and inhalation of the plume and external exposure from deposition) and thyroid Committed Dose Equivalent (CDE) exposure (resulting from the inhalation of radio-iodines).

5. Environs Surveys and Monitoring

   a. Short Term Assessment

      Short term assessment will involve the use of the estimates and projections provided by the emergency dose calculation computer programs performed in accordance with FNP-0-EIP-9, "Emergency Actions" and FNP-0-EIP-9.3 "Personal Computer-Automated Dose Assessment Methods". Onsite and offsite surveys will be performed as necessary to verify release information or as a backup assessment method should the instrumentation used for dose assessment go off-scale or become inoperable. Monitoring teams will normally be dispatched in vehicles and will be equipped with two-way radios for communication with the TSC or EOF. Teams will be equipped with liquid sampling equipment, a GM instrument, an ion chamber instrument, and/or an air sampler as deemed appropriate by the Emergency Director, Health Physics Supervisor or Dose Assessment Supervisor. An environs survey team could be in the field within one hour. Radiological survey and sampling points will be identified by sector as shown in Figure 20. The correlation of various measured parameters (contamination levels, water and air activities) to dose rates for key isotopes and gross radioactivity levels is provided by FNP-0-RCP-25.

   b. Long Term Assessment

      The long term aspects involving offsite assessments of contamination involving analysis of soil, vegetation, food, milk and water will be primarily handled by the states of Alabama, Georgia, and Florida as discussed in their Radiological Emergency Plans. The response of SNC would be to increase the sampling frequency of its established environmental monitoring program.

C. PROTECTIVE ACTIONS AND EMERGENCY ACTION LEVELS

The nature of protective actions to be implemented, the criteria for application, and the area involved or groups of persons for whom the protective actions would be taken are given here.

1. Onsite Protective Action

   a. Evacuation

      In the event of a Notification of Unusual Event an area of the turbine building, auxiliary building, or containment may have to be evacuated. Personnel would be notified to evacuate the affected area via the public address system as directed by the Emergency Plan Implementing Procedures.

      Should a Site Area Emergency, General Emergency, or an Alert be declared, immediate notification of all persons onsite may be accomplished by sounding the Plant Emergency Alarm and announcing the condition over the plant public address system. Personnel onsite would report to their pre-assigned assembly area and preparations for evacuation of nonessential persons from the site would begin. Depending on the severity of the emergency condition, these individuals will be held in an assembly area, evacuated, or returned to work.

      If a site evacuation is warranted, personnel will be advised as to which routes should be used. The normal routes are State Highway 95 North or South and County Road 42 West (Figures 17 and 19). All personnel being evacuated from the site will be monitored before being released. Personnel leaving the site would then proceed, in their own vehicles, on one of these major routes, to their residences. Transportation for persons without vehicles will be arranged.

      The details for evacuation and personnel accountability of all categories of personnel listed above are given in FNP-0-EIP-10, "Evacuation and Personnel Accountability" and FNP-0-EIP-14 "Personnel Movement, Relocation, Re-Entry and Site Evacuation".

   b. Personnel Accountability

      Each plant supervisor or the senior individual onsite from his group is responsible for accounting for all persons working in or visiting his group. Accountability within the Protected Area will be determined by the senior individual at the assembly area coordinating with the Primary Access Point (PAP) and then will be reported to the Emergency Director by the senior plant security force member at the PAP. Accountability within the Controlled Area will be determined by the senior individual at each assembly area coordinating with the Central Security Control (CSC) Building Staff and then will be reported to the Emergency Director by the senior individual in the CSC. Contractor personnel assigned to Plant Modification and Maintenance Support (PMMS) report to the Fabrication Shop and will assemble by individual craft. Fitness for Duty Facility personnel outside the Protected Area report to the Training Center Break Room. No public access areas pass through or are within the owner controlled area. The owner controlled area is fenced and/or posted. Security patrols are conducted at random intervals as a part of daily routine. Detailed procedures for determining and reporting accountability are given in FNP-0-EIP-10, "Evacuation and Personnel Accountability". Responsibilities for accountability during local evacuations are also listed in FNP-0-EIP-10, "Evacuations and Personnel Accountability".

Following accountability initiation, security personnel will control site access and egress for the duration of the emergency, maintaining entry/exit logs to allow accountability of all personnel onsite.

c. Contamination and Exposure Control Measures

The limits for personnel exposure set forth in 10CFR20 shall not be exceeded without approval of the Emergency Director or his designee. Emergency exposure criteria are:

1) Farley Nuclear Plant personnel who have completed the onsite radiation protection training, may receive

   o 10 Rem

When emergency onsite action is required to eliminate a source or potential source that represents a hazard to the general public or to prevent a substantial loss in property and a lower dose is not practicable.

   o 25 Rem

For life-saving operations such as rescue and search for known missing persons or for protection of large populations when a lower dose is not practicable.

   o >25 Rem but not to exceed 100 Rem

For lifesaving or protection of large populations only on a voluntary basis. The volunteer worker should do so with full awareness of the associated risks for the radiation dose to be incurred.

2) Hospital and Ambulance Service Personnel, may receive

   o 3 Rem

If there is an adequate number of attendants such that rotation may be accomplished without further endangering the patient(s).

   o 5 Rem

If the number of attendants is limited such that personnel cannot be rotated.

   o 25 Rem

   To save a life.

Dosimetry, respiratory protection equipment and protective clothing will be issued for use in accordance with established Radiological Control Procedures. A supply of radio protective drugs (potassium iodide) is available onsite and, if necessary, will be issued at the direction of the Emergency Director to emergency personnel remaining or arriving onsite.

The levels of permissible radioactive contamination for personnel and equipment to be released from an RCA during an emergency are as follows:

Personnel	Equipment	
<5,000 dpm/100 cm^2	ND GMT/100 cm^2	(smearable)
	and	
	< .25 mR/hr	(fixed)

However, the Emergency Director may authorize higher levels based on plant conditions and recommendations from the HP Supervisor. When levels above these values are encountered, decontamination will be initiated. Facilities, supplies and waste disposal capability exists to provide for both personnel (emergency or onsite relocated) and equipment decontamination. Methods for equipment decontamination are discussed in FNP-0-RCP-862, "Area and Equipment Decontamination Guidelines" and for personnel in FNP-0-RCP-29.1, "Guidelines for Personnel Decon and Response to Personnel Contamination Events" with particular attention being given to radioiodine contamination of the skin. Extra clothing for personnel will be provided in the event personal clothing is confiscated. Information on personnel decontamination facilities is contained in Section III.

To prevent or minimize direct or subsequent ingestion exposure to radioactive materials deposited on the ground or other surfaces, access into the exclusion area will be controlled by security personnel. Additionally, if conditions warrant, the site drinking water will be sampled and analyzed for radioactivity and quarantined, if necessary. If a quarantine is placed on the water, it will not be returned to use until the activity has returned to within acceptable limits as dictated by the State of Alabama Board of Health "Regulations Governing Public Water Supplies".

Personnel which are found to be contaminated when monitored during evacuation will be returned to the plant for deconning if possible. If the plant is not accessible, the personnel will be transported to the nearest decontamination facility.

Offsite contamination controls are described in the states of Alabama, Georgia, and Florida plans.

2. Offsite Protective Action

The states of Alabama, Georgia, and Florida are responsible, in their respective state, for handling the offsite radiological aspects of any emergency that should develop at the Farley Nuclear Plant. The Emergency Plans for Alabama, Georgia, and Florida are given in each states Radiological Emergency Plan.

The criteria to be used for offsite protective action recommendations is given below. The basis for protective action guides is the "Manual of Protective Action Guides and Protective Action for Nuclear Incidents", EPA-400-R-92-001. It should be noted that these levels are quite low and are used as guidelines for protective action rather than rigid levels of action. Recommendation of sheltering in residences shall be considered when there is radiological puff release that exceeds the projected dosage for a general emergency listed in section a below or there are hazards on or off-site that would make an evacuation dangerous. Areas within a ten mile radius in which protective action is deemed necessary will be referred to by Evacuation Zone as shown in Figure 21. The population distribution within this ten-mile radius has been predicted for the life of the plant and is summarized graphically in Figure 22.

a. Classification of Offsite Incidents

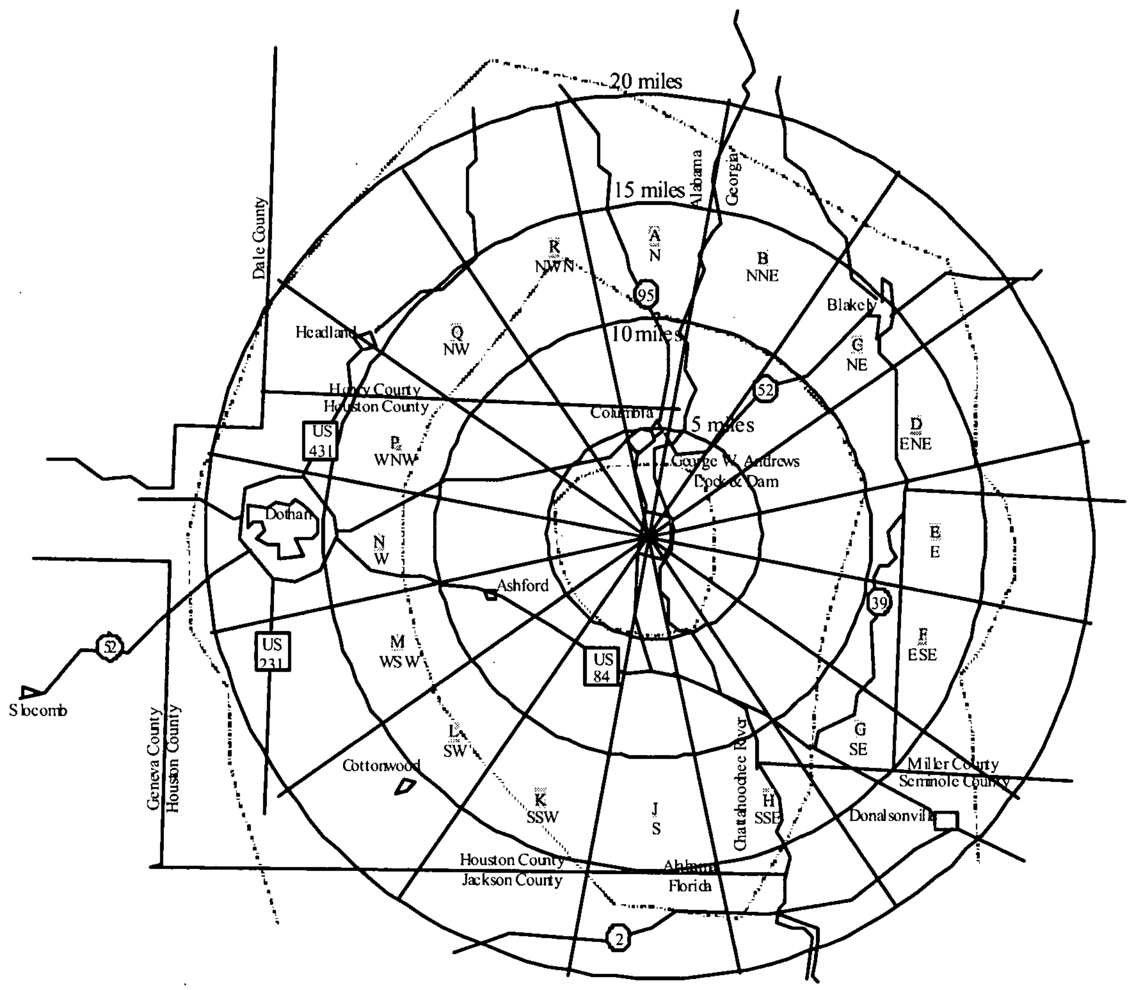
SNC Classification	Projected Dosage	Organ or Media Involved
GENERAL	1.0 Rem	TEDE
	5.0 Rem	Thyroid CDE
SITE AREA	0.1 Rem	TEDE
	0.5 Rem	Thyroid CDE

b. Response

Classification	Protective Actions to be Recommended to State Authorities
GENERAL	Recommendations based on plant conditions or projected dose: 1.) PAR 1 – Shelter to 2 miles and 5 mile downwind zones. Used when there is radiological puff release that exceeds the projected dosage for a general emergency listed in section a above or there are hazards on or off-site that would make an evacuation dangerous. 2.) PAR 2 – Evacuate to 2 miles and 5 mile downwind zones. Used when a general emergency has been declared but the projected dosage for a general emergency listed in section a above has not been exceeded. 3). PAR 3 – Evacuate to 5 miles and 10 mile downwind zones Used when a general emergency has been declared and the projected dosage for a general emergency listed in section a above has been exceeded. 4) Distribution of potassium iodide (KI) in accordance with State plans. 5) Advise Remainder of EPZ to Monitor Local Radio/TV Stations and TARs for Additional Information.

Classification	Protective Actions to be Recommended to State Authorities
SITE AREA	No Protective Action Recommendations are to be made at the Site Area emergency level. The Emergency Director should upgrade to a General Emergency if PARs are determined to be needed and not already in a General Emergency.
ALERT	No Protective Action Recommendations are to be made at the Alert level. The Emergency Director should upgrade to a General Emergency if PARs are determined to be needed and not already in a General Emergency.

The authority for initiation or relaxation of protective action recommendations is vested solely with the Emergency Director and may not be delegated to any other member of the emergency organization. Processes for development, approval, and notification of protective action recommendations are described in NMP-EP-111, "Emergency Notifications" and NMP-EP-112 "Protective Action Recommendations".



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RADIOLOGICAL SURVEY AND SAMPLING REPORTING SECTORS

FIGURE 20

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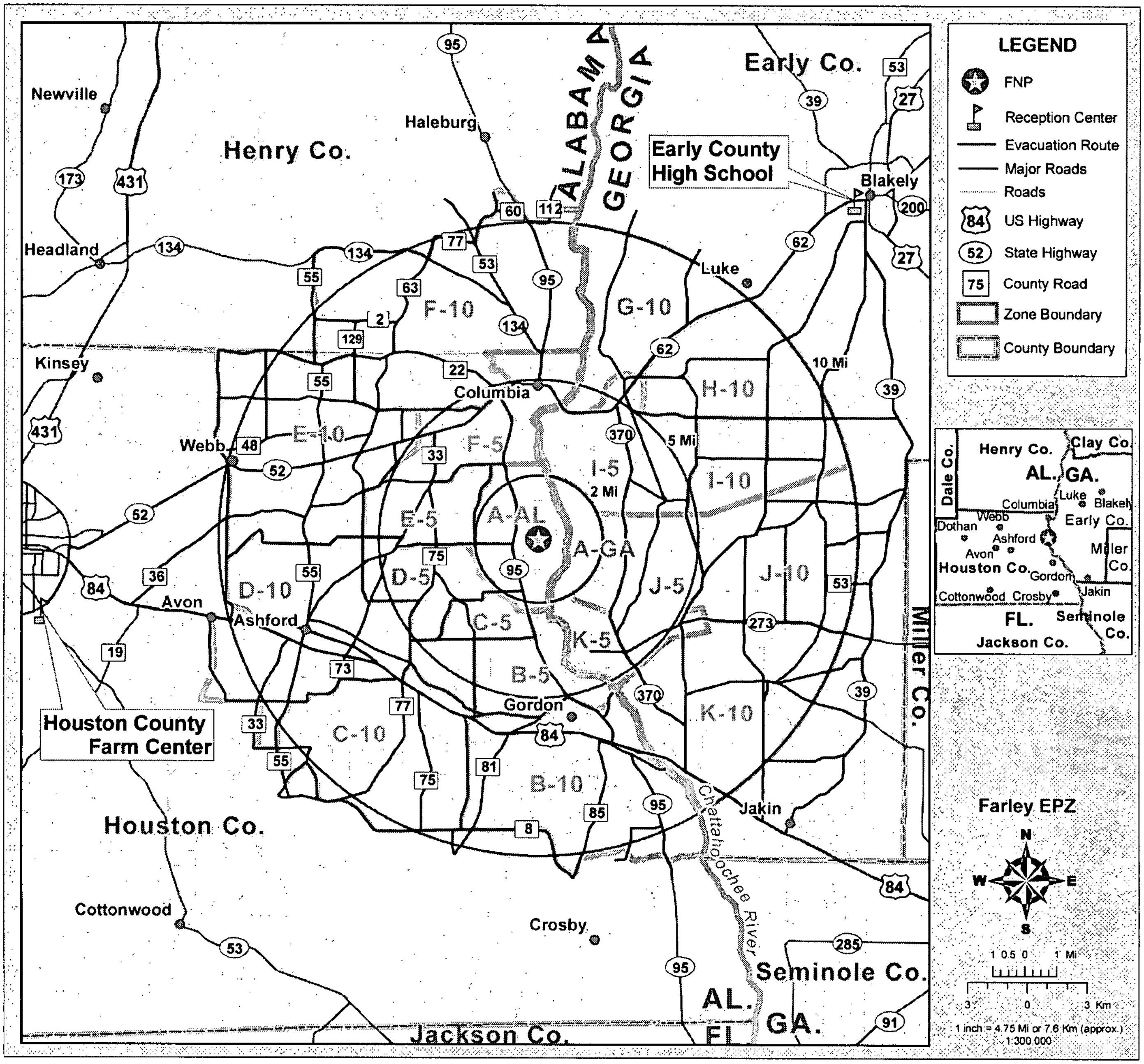

PROTECTIVE ACTION SECTORS

FIGURE 21

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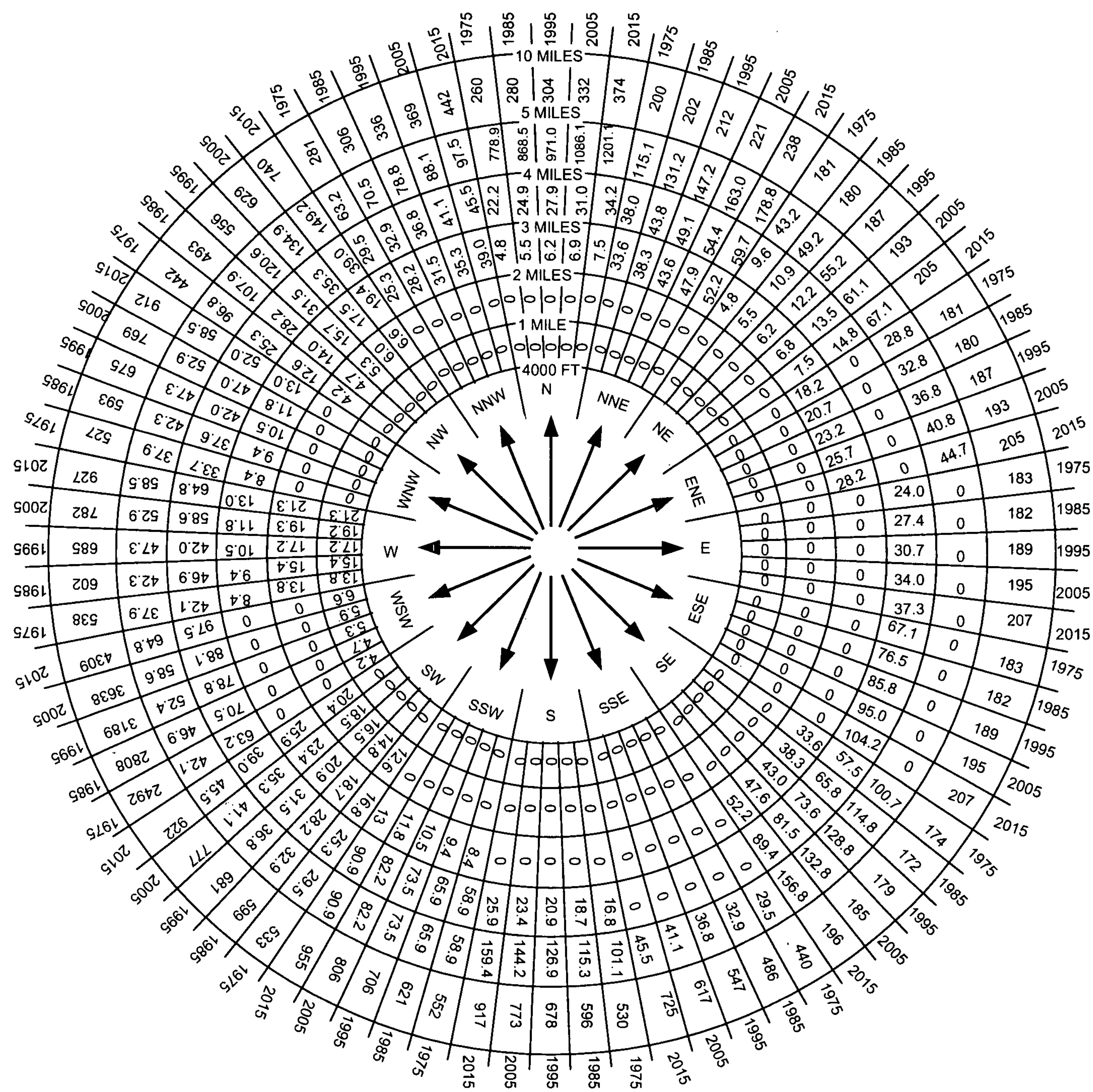


PREDICTED POPULATION IN THE VICINITY OF FARLEY NUCLEAR PLANT
FIGURE BASED ON FSAR FIGURES 2.1-5, 6 AND 7

FIGURE 22

V. ACTIVATION OF EMERGENCY ORGANIZATION

A. DECLARATION OF AN EMERGENCY

The Shift Manager shall have the authority and responsibility to immediately and unilaterally declare an emergency and initiate emergency response. Section IV of this plan delineates criteria for declaring emergency conditions.

Upon declaration of an emergency the Shift Manager will immediately notify the on-call Emergency Director (ED). Until the on-call ED arrives onsite and relieves the Shift Manager, the Shift Manager shall complete the duties of the ED prior to the on-call ED taking full responsibility for implementation of the Emergency Plan. Duties of the Shift Manager as an Emergency Director are addressed in FNP-0-EIP-3.0, "Duties of the Emergency Director". Additional notification responsibilities are discussed in Section VI and described in NMP-EP-110, "Emergency Classification Determination and Initial Action" and NMP-EP-111, "Emergency Notifications".

The ED, Shift Clerk, or designee will notify the EOF Manager of the emergency condition. The EOF Manager will decide on the appropriate level of activation utilizing the criteria shown in Table 4.

B. ORGANIZATION ACTIVATION

The minimum quantity of personnel available on shift and the quantity of additional personnel available within 75 minutes following declaration of the emergency to staff the emergency organization are shown in Table 3.

Each shift shall have a Shift Technical Advisor (STA). The STA will have No duties or responsibilities for manipulation of controls or command of operations during an emergency.

The normal shift crew will consist of at least those positions listed as "on shift" in Table 3. There will be a licensed operator in each unit's control room at all times when fuel is in the core of the respective unit. There will be a Senior Reactor Operator (SRO) in the control room (shared) at all times when fuel is in either core. Shift staffing for core alterations will also include either a SRO limited to fuel handling or a SRO not assigned any duties concurrent with core alterations.

Upon receiving notification of an emergency, the Emergency Director will proceed to the site. A shift communicator will coordinate the plant call list to notify those individuals of the Emergency Organization needed to meet initial activation requirements. The EOF Manager will be notified in accordance with NMP-EP-110, "Emergency Classification Determination and Initial Action".

Criteria for the activation of the Technical Support Center, Operations Support Center and Emergency Operations Facility are shown in Table 4.

1. Technical Support Center Activation

The onsite emergency response organization which will be directed from the TSC is described in Section II. The TSC will be staffed and ready to receive emergency response functions by the following on-call individuals within 75 minutes following declaration of an emergency requiring TSC activation:

Emergency Director

TSC Manager

Operations Supervisor

Health Physics Supervisor

Engineering Supervisor

Maintenance Supervisor

ENN Communicator

Within eight hours of the declaration of the emergency one full complement of personnel as designated above will be available to relieve the TSC personnel.

There shall be sufficient personnel available within 16 hours of the declaration of the emergency to ensure that the TSC can be staffed on a 24-hour-a-day basis for at least one week.

2. Operations Support Center (OSC) Activation

The Operations Support Center will be staffed and ready to provide support to the emergency response effort as directed by the Emergency Director within 75 minutes following declaration of an emergency requiring OSC activation.

Other members of the Emergency Organization arriving at the plant will report to their assigned assembly areas. Within 8 hours after declaration of an emergency, sufficient personnel shall be available in the OSC to ensure that shift personnel can be relieved by qualified individuals.

Within 16 hours after declaration of an emergency, sufficient personnel shall have been notified and placed on-call to ensure that the OSC can be staffed on a 24-hour-a-day basis for at least one week.

3. Emergency Operations Facility (EOF) Activation

   The corporate emergency response organization which will be activated to respond from the EOF is described in Appendix 7(G).

C. OFFSITE CORPORATE ORGANIZATION ACTIVATION

   The corporate emergency response organization which will be directed from the EOF is described in Appendix 7(G). The corporate Emergency Communication Organization activation is described in Appendix 10(J).

D. OFFSITE LOCAL, STATE AND FEDERAL AGENCIES

   Notification of offsite governmental agencies is discussed in Section VI. Activation of the state agencies is discussed in their respective plans.

MAJOR FUNCTION AREA	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT*	CAPABILITY FOR ADDITIONS WITHIN 75 MINUTES *****
Plant Operations and Assessment of Operational Aspects		Shift Supervisor (SRO)	1	----
		Shift SRO	1	----
		Control Room Operators	2	----
		Auxiliary Operators	2	----
Emergency Direction and Control (Emergency Director)***		Shift Manager or Emergency Director	1**	----
Notification/ Communication****	Notify Licensee, State Local and Federal personnel & maintain communication.		2	2
Radiological Accident Assessment and Support of Operational Accident Assessment	Emergency Operations Facility (EOF) Dir. Offsite Dose Assessment	Senior Manager	----	1
		Senior CHM, & ENV. with Expertise in Offsite Dose Assessment	1	----
	Offsite Surveys ##	HP/CHM. Technicians and other trained personnel	2	2
	Onsite (out-of-plant)##		----	2
	In-plant surveys		2	2
	Chemistry/Radiochemistry	CHM Technician	1	1
Plant System Engineering Repair and Corrective Actions	Technical Support	Shift Technical Advisor#	1	----
		Core/Thermal Hydraulics#	----	1
		Electrical	----	1
		Mechanical	----	1
	Repair and Corrective Actions	Mechanical Maintenance/	1**	1
		Rad Waste Operator		1
		Electrical Maintenance	1	1
		Instrument and Control (I&C) Technician	1	1

TABLE 3. Page 1 of 2

MAJOR FUNCTION AREA	MAJOR TASKS	POSITION TITLE OR EXPERTISE	ON SHIFT*	CAPABILITY FOR ADDITIONS WITHIN 75 MINUTES *****
Protective Actions (In-plant)	Radiation Protection: a. Access Control b. HP Coverage for repair, corrective actions, search and rescue first-aid & firefighting c. Personnel monitoring d. Dosimetry	HP/CHM Technicians or other trained personnel	2	2
Firefighting	________________	________________	Fire Brigade per the FSAR	Local Support
Rescue Operations and First-Aid	________________	________________	2**	Local Support
Site Access Control and Personnel Accountability	Security, firefighting communications, personnel acountability	Security Personnel	All per Security Plan	
		TOTAL	19	19

NOTES:

- * For each unaffected nuclear unit in operation, maintain at least one SRO, one control room operator and or auxiliary operator except that units sharing a control room may share an SRO if all functions are covered.
- ** May be provided by shift personnel assigned other functions.
- *** Overall direction of facility response to be assumed by EOF director when all centers are fully manned. Direction of minute-to-minute facility operations remains with senior manager in technical support center or control room.
- **** ENN Communicator qualified shift SRO.
- ***** Staffing capability in 75 minutes is dependent upon immediate availability of personnel, time of day, weather conditions, or radiological conditions.
- # The STA performs the needed functions of STA & core/thermal hydraulics monitoring & analysis prior to augmentation during the first 75 minutes.
- ## A single out-of-plant radiation monitoring team may cover both on-site and off-site surveys prior to augmentation within 75 minutes.

TABLE 3. - Page 2 of 2

TABLE 4

EMERGENCY FACILITY ACTIVATION

	Unusual Event	Alert	Site Area Emergency	General Emergency
Technical Support Center	*	Activate#	Activate#	Activate
Operations Support Center	*	Activate#	Activate#	Activate
Emergency Operations Facility	**	Activate#	Activate#	Activate
APC Corporate Headquarters	**	Activate#	Activate#	Activate
Emergency News Center	**	Activate#	Activate#	Activate

NOTE:

* No action, standby or activation at the discretion of the Emergency Director

** No action, standby or activation at the discretion of the On-call EOF Manager

Activation will be to the extent deemed necessary by the Emergency Director and On-call EOF Manager

DELETED

Figure 23

VI. NOTIFICATION PROCEDURES

FNP-0-EIP-8.1, "Emergency Phone Directory", contains a listing (updated quarterly) of the names, addresses, and telephone numbers of the individuals and organizations referred to in this section. A copy of FNP-0-EIP-8.1 will be maintained in the control room and by the on-call Emergency Director. Figure 24 illustrates the order and responsibilities for notification in the event of an emergency. An authentication method is used to verify any notifications made by FNP utilizing commercial telephones.

A. STATE AND LOCAL AGENCY NOTIFICATION

The Emergency Director is responsible for notifying the Alabama Emergency Management Agency and the Georgia Emergency Management Agency of all declared emergencies. The Alabama Emergency Management Agency will notify the Alabama Radiation Control Office of the State of Alabama Department of Public Health who will in turn notify the Florida Division of Emergency Management.

In addition to these State notifications, the Emergency Director will notify local emergency management agencies in Houston County, Alabama and Early County, Georgia utilizing the Emergency Notification Network or commercial telephone.

NMP-EP-111, "Emergency Notifications", contains the initial messages that will be used by the Emergency Director to notify the state and local agencies for the different classifications of emergencies. The content of emergency messages has been mutually agreed upon with State and Local agencies. The procedure to be followed for message authentication is contained in NMP-EP-111, "Emergency Notifications." These initial messages shall contain, at a minimum the following if applicable and available:

1. Class of emergency
2. Actual or potential release information
3. Potentially affected population
4. Advisability of protective measures

Required follow-up message information has been agreed upon by the states. NMP-EP-111 makes provisions for follow-up messages to be sent to the states. These messages contain the following information as appropriate:

1. Location of incident and name and telephone number (or communications channel identification) of caller
2. Date/time of accident
3. Class of emergency

4. Type of actual or projected release (airborne, liquid) and estimated duration times
5. Estimate of quantity of radioactive material released or being released and the height of release
6. Chemical and physical form of released material, including estimates of the relative quantities and concentrations of noble gases, iodines, and particulates
7. Meteorological conditions (wind speed, direction (from), stability classification; form of precipitation, if any)
8. Projected dose at site boundary
9. Projected dose at about 2, 5, and 10 miles
10. Emergency response actions underway
11. Recommended emergency actions, including protective measures in sector(s) affected
12. Prognosis for worsening or termination of event based on plant information

B. PLUME EXPOSURE PATHWAY EMERGENCY PLANNING ZONE PUBLIC NOTIFICATION AND INFORMATION

1. Notification

Southern Nuclear Operating Company has provided the administrative and physical means for alerting and providing prompt instructions to the public within the plume exposure pathway EPZ. Siren systems have been installed in the Alabama cities of Columbia, Gordon and Ashford. Siren activation controls are located at the Houston County Emergency Management Agency Office in Dothan, Alabama. Residents in the siren zones have been instructed to tune to specific emergency alert radio or TV stations if the sirens are activated.

Residents inside the plume exposure pathway EPZ but outside the siren zones have been provided with tone alert radios and a radio station has been installed at the FNP site to transmit pre-taped messages for alerting the public and instructing them to tune to local emergency alert stations for detailed information. The mechanism to initiate an alert is located in the Houston County Emergency Management Agency Director's office.

A written agreement has been established to broadcast the pre-taped messages upon request by the Alabama Emergency Management Agency, Houston County Emergency Management Agency or the Georgia Emergency Management Agency. Authentication schemes exist to verify requests for tape broadcast.

The emergency plans for the states of Alabama, Georgia and Florida contain prepared messages for use by emergency alert stations notifying the public of emergency conditions.

2. Information

Processes for dissemination of information to local news media and the public annually are discussed in the Emergency Communications Plan, Appendix 10(J).

3. News Release Coordination and Rumor Control

Processes for news release coordination and rumor control are discussed in the Emergency Communications Plan, Appendix 10(J).

C. NRC OFFICE OF INSPECTION AND ENFORCEMENT

The Emergency Director or his designee will notify the Nuclear Regulatory Commission of any emergency condition utilizing the Emergency Notification System.

D. SAVANNAH RIVER OPERATIONS OFFICE

If conditions warrant, immediate assistance will be requested by the Emergency Director from the DOE Savannah River Operations Office if their assistance is required to protect the health and safety of the general public.

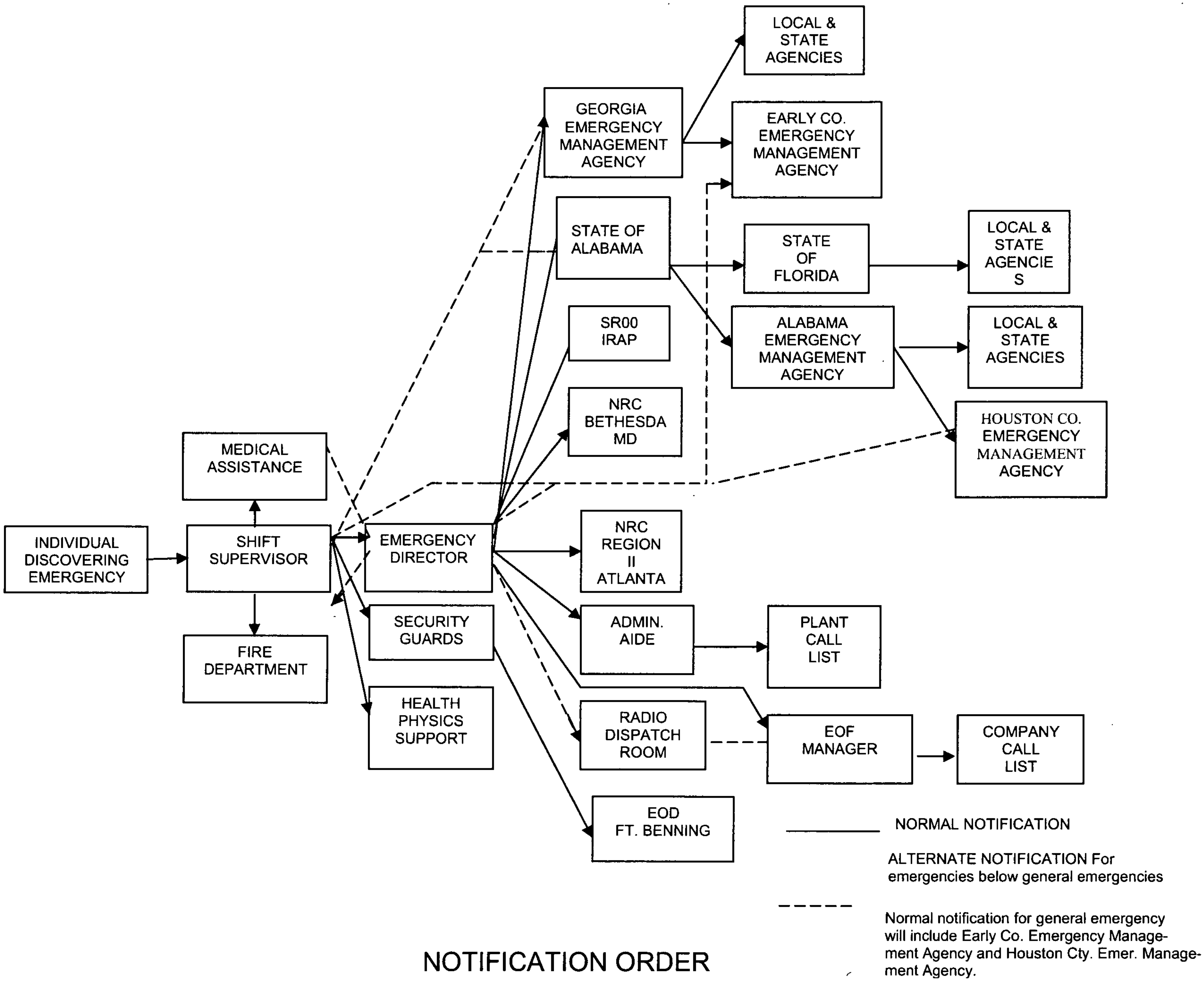
E. MEDICAL

As the situation merits, the Shift Supervisor, Emergency Director or EOF Manager will notify one or more of the following:

1. Southeast Alabama Medical Center - Dothan
2. Dothan Ambulance Service (Pilchers Ambulance Service), Inc. – Dothan
3. University of Alabama Hospital - Birmingham
4. American Medical Response Ambulance Service - Birmingham
5. Oak Ridge Institute for Science and Education - REAC/TS

F. FIRE

If necessary, outside firefighting support from the Dothan Fire Department may be requested by the Shift Supervisor or Emergency Director.



NOTIFICATION ORDER

Figure 24

VII. RECOVERY

A. METHODOLOGY

Due to the unforeseeable conditions that would exist in an emergency condition, specific recovery criteria and procedures will be developed when required, considering maximum protection for plant personnel and the general public consistent with reasonable efforts to restore the affected Unit and continuing operation of the unaffected unit.

The decision to relax protective measures will be based upon a comprehensive review of plant system parameters. These shall include but not be limited to the following:

1. Stability of the reactor shutdown condition i.e., successful movement toward a cold shutdown condition.
2. Integrity of the reactor containment building.
3. Operability of radioactive waste systems and decontamination facilities.
4. The availability and operability of a heat sink.
5. The integrity of power supplies and electrical equipment.
6. The operability and integrity of instrumentation including radiation monitoring equipment. In the latter instance this shall include portable equipment assigned to the emergency.
7. Availability of trained personnel and support services.

The Emergency Director will analyze the input from his advisors in the areas listed above to determine if plant restoration efforts can begin. The following criteria shall be considered appropriate for the consideration of relaxation of protective measures:

1. Plant parameters of operation no longer indicate a potential or actual emergency exists.
2. The release of radioactivity from the plant is controllable and no longer exceeds permissible levels and no danger to the public from this source is credible.
3. The plant is capable of sustaining itself in a long term shutdown condition.
4. Plant entry and clean-up is possible without workers receiving in excess of their permissible exposures.

B. ORGANIZATION

The recovery organization which will conduct the activities of returning the plant toward its pre-emergency condition to the extent reasonable is described in Section II.B.3.

C. NOTIFICATION

The Emergency Director shall notify the Vice President – Farley and company management that a decision has been reached to initiate a recovery operation. The ED shall then notify offsite agencies' representatives ensuring the NRC, and state and local authorities are provided with the same information. He shall also inform these agencies if any change in the structure of the recovery organization is to occur.

VIII. MAINTAINING EMERGENCY PREPAREDNESS

A. EXERCISES AND DRILLS

Periodic drills and exercises will be conducted as described below.
The scenarios for use in these drills will include the following elements:

o The basic objective,

o The date, time, place(s) and participating organizations,

o The simulated event,

o A time schedule of real and simulated events,

o A narrative summary describing conduct of the drill.

Monitoring personnel shall be stationed at various locations to observe each individual's ability to perform his assigned emergency function. During drills and Nuclear Regulatory Commission (NRC) non-evaluated exercises, on-the-spot correction of erroneous performance and a demonstration of proper performance may be made by the monitoring personnel.

1. Radiation Emergency Exercises
   a. Exercises simulating radiation emergencies will be conducted on a frequency consistent with 10CFR50, Appendix E.IV.F. These scenarios will be varied from exercise to exercise such that all major elements of the plans and emergency organizations are exercised at least once every 5 years. These exercises will be preplanned with the following purposes:

      1) To determine the effectiveness of the FNP emergency organization in handling emergencies,

      2) To evaluate communications and action support with off-site agencies,

      3) To evaluate the interface with and the response of the Company Emergency Organization,

      4) Test the adequacy, timing and content of the EIP's,

      5) Test emergency equipment and communications networks,

      6) Test the public Alert and Notification System,

      7) Keep affected personnel aware of their role in the plan.

One (1) exercise may be started between 6 p.m. and 4 a.m. once every six (6) years. One (1) exercise may be performed every six (6) years which is unannounced, except as required for effective coordination with the management of the various agencies and for the evaluation of the health and safety of the general public.

b. Both full-scale and small-scale exercises will be conducted and will include participation by appropriate state and local government agencies as follows:

   1) Full scale exercises which test as much of the company, state and local emergency plans as is reasonably achievable without mandatory public participation will be conducted at least once every five years and at such greater frequency as necessary to provide for the following:

      (a) Enable each state and local government in the plume exposure pathway EPZ to participate in at least one full-scale drill per year,

      (b) Enable each state in the ingestion pathway EPZ to participate in at least one full-scale drill every six years.

   2) A small scale exercise which tests the adequacy of communication links, establishes that response agencies understand the emergency action levels and tests at least one other component (e.g., medical or offsite monitoring) of the offsite emergency response plans for the company and state and local agencies within the plume exposure pathway EPZ will be conducted each year that a full scale drill is not conducted.

c. For Nuclear Regulatory Commission (NRC) evaluated exercises the NRC will be provided with a description of exercise objectives at least 75 days prior to the exercise. Participation in the exercise by the NRC shall be at their discretion.

d. The Alabama Emergency Management Agency will provide FEMA with a description of exercise objectives at least 90 days prior to a FEMA evaluated exercise. Participation in the exercise by FEMA shall be at their discretion.

e. Formal critiques shall be provided following each exercise to identify areas of weakness. Corrective action, as appropriate, for company onsite and offsite weaknesses shall be the responsibility of the Vice President-Farley. Corrective action, as appropriate, for company public information weaknesses shall be the responsibility of the APC Public Relations Senior Vice President and the SNC Vice President Administrative Services.

2. Drills

a. Fire Drills

1) Fire Drills will be conducted with fire brigade members as required by the plant's FSAR.

2) Fire Drills will be conducted annually which will involve the Dothan Fire Department.

b. Medical Emergency Drills

A medical emergency drill will be conducted annually which will involve ambulance and offsite medical treatment facility participation.

c. Radiological Monitoring Drills

Radiological monitoring drills will be conducted annually which will include initiating onsite and offsite radiological monitoring of vegetation, soil, water, and air.

d. Health Physics Drills

Health Physics drills will be conducted semiannually which will involve response to simulated elevated airborne and liquid samples and direct radiation measurements in the plant environment. Analysis of reactor coolant samples including use of the post accident sampling system will be conducted annually.

e. Appropriate local, state, and federal agencies will be advised of major drills in advance to allow their observation or participation. All observing or participating agencies will be requested to provide comments on drill evaluation and it will be the responsibility of the Plant Manager to implement corrective action as appropriate.

B. TRAINING

1. Training of the Plant Emergency Organization

All Farley Nuclear Plant personnel, including those assigned on a temporary basis or in a training status, will receive a thorough orientation on all emergency plans and procedures required to ensure their safety. Changes in emergency plans and EIP's applicable to all plant personnel will be presented using training notices or other appropriate means. Persons with specific duties during an emergency will receive additional training appropriate to their respective assignments. The responsibility for coordinating their training is that of the Plant Training Manager.

Continuing training will be provided to all personnel as described below:

Specific training that will be conducted is listed below:

a. Emergency Director Training (annually)
members of the plant staff who may serve as Emergency Director will receive training in:

   1) Supervision of emergency teams,

   2) Emergency assessment including interpretation of data and estimation of radiation exposure,

   3) Coordination and communication with offsite groups.

b. Field Monitoring Team Training (annually)

   This training will be given to plant and vendor personnel that may be required to perform surveys in-plant, on the environment, or at SAMC. It will include instruction in the selection and use of survey instruments and air sampling equipment and in re-entry criteria.

c. First Aid Training (triennially)

   Plant personnel will be considered first aid qualified upon successful completion of the Company's - First Aid and CPR Course.

d. Fire Control (per FSAR requirements)

   A training program for the plant employees that serve on fire fighting teams is conducted under the direction of the Plant Training Manager. This course covers methods and equipment for fighting all types of fires that could occur on the site. Appropriate emphasis is placed on the radiological aspects of fire fighting. Drills and critiques are conducted periodically to train Fire Brigade personnel and to maintain their efficiency.

e. Emergency Repair Party Training (annually)

   Maintenance and I and C personnel who may be assigned to the Emergency Repair Party receive training in Radiation Control Procedures as part of their normal plant training. Personnel selected for Emergency Repair Party work will possess the required journeyman skills for the particular activity.

f. Security Personnel (annually)

Security personnel will receive training on FNP-0-EIP-7, "Security Support to the Emergency Plan", including personnel evacuation and accountability, access control, vehicle escort, and bomb search activities. Personnel will also receive training on Contingency Implementing Procedure 13 covering security activities during fire, explosion, or other catastrophe.

g. Communications Personnel (annually)

Personnel responsible for the transmission of emergency information and instructions will receive training in accordance with Appendix 10(J).

2. Training of the Corporate Emergency Organization

Information related to corporate emergency organization training is provided in Appendix 7.

3. Training of Local Services Groups

   Offsite groups, such as fire departments, police and sheriff's departments, and ambulance services, that may participate in onsite activity will be encouraged to attend a training course to ensure that they are familiar with the plant layout and their actions in the event of radiological and non-radiological incidents. The Plant Training Manager is responsible for coordinating this training.

4. Training of SNC Emergency Planners

   The EP Supervisor, Emergency Planning Coordinator, and other individuals with emergency planning responsibilities are trained by self-study and by attending industry seminars, short courses, workshops, etc.

C. INSPECTION, CALIBRATION AND TESTING OF EMERGENCY EQUIPMENT AND SUPPLIES

To insure the operational readiness of emergency supplies and equipment the following will be performed:

1. Periodic calibration using manufacturers' recommendations as guidelines on all portable emergency instrumentation designated for emergency use. This includes both onsite equipment and offsite equipment at SAMC supplied by APC/SNC.

2. Inspection quarterly of all onsite and SAMC emergency equipment and supplies designated for emergency use and supplied by APC/SNC. The purpose of the inspection is to ensure that the inventory is correct, that the supplies are functional and that instrument calibration is current.

3. An adequate reserve of emergency equipment will be maintained to allow for equipment taken out of service for repair, calibration, or replacement.

4. Communications Checks

a. Communications checks will be performed monthly with all locations which are part of the Emergency Notification Network.

b. The Emergency Notification System shall be tested at least monthly.

c. The telephone numbers of organizations listed in FNP-0-EIP-8.1 will be updated quarterly and verified annually.

d. The EOF/TSC/OSC conference capability will be tested at least annually.

e. Radio communication equipment for Field Monitoring Team communications will be tested at least annually.

f. The public Alert and Notification System will undergo a full activation test at least annually.

D. REVIEW AND UPDATING OF THE PLAN AND PROCEDURES

Responsibility for the planning effort, including review and updating of the emergency plans and procedures, is described in Appendix 9(I).

APPENDIX 1(A)

EMERGENCY SUPPLIES AND EQUIPMENT

I. TECHNICAL SUPPORT CENTER

Emergency Plan

Emergency Plan Implementing Procedures

Drawings of Facility and Plant Site

Records Material

First Aid Kit

II. CONTROL ROOM

Emergency Plan

Emergency Plan Implementing Procedures

Records Material

Tools and Other Hardware

Stretcher

First Aid Kit

Respiratory Protection Equipment

Survey Instruments

Self Contained Breathing Apparatus

III. OPERATIONS SUPPORT CENTER

Survey Instruments

Dosimetry Devices

Respiratory Protection Equipment

Protective Clothing

IV. CENTRAL SECURITY CONTROL (CSC) BUILDING

Ambulance Kit

Respiratory Protection Equipment

V. EMERGENCY OPERATIONS FACILITY

Refer to Appendix G

First aid kit
Flashlights
Clipboards, writing materials, and secretarial supplies
EPZ/IPZ maps

VI. AUXILIARY BUILDING

Protective Clothing

Decontamination Supplies

Signs and Labels

Respiratory Protection Equipment

First Aid Kit and Supplies

Stretchers

Fire Rescue Suit

Fire Brigade Equipment

APPENDIX 2(B) INDEX

Letters of Agreement on File

The following letters of agreement and memorandums of understanding are maintained on file with the Emergency Planning Coordinator:

Agreement Between Department of Pensions and Security of the State of Alabama, Alabama Department of Public Health, Alabama Emergency Management Agency and Alabama Power Company

Memorandum of Understanding Between Southern Nuclear Operating Company and Georgia Emergency Management Agency and Georgia Department of Natural Resources Environmental Protection Division and Early County Sheriff's Department and Chairman, Early County Commission and Mayor, City of Blakely Regarding Notifications Associated with a Radiological Emergency at the Joseph M. Farley Nuclear Plant

Media Center Lease Agreement

Agreement for Back-up Fire Protection Services Between the City of Dothan, Alabama and Southern Nuclear Operating Company

Letter — INPO – Certifying plant emergency assistance agreements between INPO and member utilities remain in effect as described in the INPO Emergency Resources Manual located on the INPO website. Agreements include:

- Nuclear Power Plant Emergency Response Voluntary Assistance Agreement
- Voluntary Assistance Agreement by and Among Electric Utilities Involved in Transportation of Nuclear Materials

Letter — Department of Energy

Agreement For Notification of the State of Florida of a Radiological Emergency at the J. M. Farley Nuclear Plant

Assignment of Emergency Planning Agreements

Memorandum of Understanding Between Southern Nuclear Operating Company and Alabama Emergency Management Agency and Alabama Department of Public Health office of Radiation Control and Houston County Sheriff's Department and Chairman, Houston County Commission, and Mayor, City of Dothan Regarding Notifications Associated with a Radiological Emergency at the Joseph M. Farley Nuclear Plant

APPENDIX 3(C)

RADIATION MONITORING SYSTEM

The Radiation monitoring system is divided into three areas. These areas and the channels comprising each area are shown below. The monitors are installed on Units 1 and 2 unless otherwise noted.

1. Area Radiation Monitors

Channel	Description	Range
R-1	Control Room	1×10^{-4} to 1×10^{1} R/hr
R-1B	Technical Support Center	1×10^{-4} to 1×10^{1} R/hr
R-2	Containment	1×10^{-4} to 1×10^{1} R/hr
R-3	Radiochemistry Lab	1×10^{-4} to 1×10^{1} R/hr
R-4	Charging Pump Room	1×10^{-4} to 1×10^{1} R/hr
R-5	Spent Fuel Bldg.	1×10^{-4} to 1×10^{1} R/hr
R-6	Sampling Room	1×10^{-4} to 1×10^{1} R/hr
R-7	In-core Instrumentation Room	1×10^{-4} to 1×10^{1} R/hr
R-8	Drumming Station	1×10^{-4} to 1×10^{1} R/hr
R-9	Sample Panel Room (Unit 2)	1×10^{-4} to 1×10^{1} R/hr
R-30	Radwaste Area Ventilation return from 100 foot elevation and below	10 to 10^{6} cpm
R-31	Radwaste Area Ventilation return from 121 foot elevation	10 to 10^{6} cpm
R-32	Radwaste Area Ventilation return from 139 foot elevation	10 to 10^{6} cpm
R-33	Radwaste Area Ventilation return from 155 foot elevation	10 to 10^{6} cpm

Channel	Description	Range
R-34	Access Control Area Ventilation Return (Unit 1 only)	10 to 106 cpm
R-35 (A,B)	Computer Room Air Handling Unit Air Intake (common for both units)	10 to 10^6 cpm

2. Process Radiation Monitors

R-10	Penetration Room Filtration Discharge Monitoring System	1 x 10^{-9} to 1 x 10^{-6} uCi/cc
R-11	Containment Atmosphere Monitoring System	1 x 10^{-9} to 1 x 10^{-6} uCi/cc
R-12	Containment Atmosphere Monitoring System	1 x 10-6 to 1 x 10-3 uCi/cc
R-13	Waste Gas Processing System	1 x 10^{-1} to 1 x 10^{+4} uCi/cc
R-14	Plant Vent Gas Monitoring System	5 x 10^{-7} to 1 x 10^{-4} uCi/cc
R-15A	Condenser Air Ejector Monitoring System	1 x 10^{-6} to 1 x 10^{-3} uCi/cc (5 x 10^{-7} for Kr-85)
R-16	Boron Recycle Monitoring System	1 x 10^{-5} to 1 x 10^{-2} uCi/cc
R-17 (A,B)	Component Cooling Water Monitoring System	1 x 10^{-5} to 1 x 10^{-2} uCi/cc
R-18	Liquid Waste Processing Monitoring System	1 x 10^{-5} to 1 x 10^{-2} uCi/cc
R-19	S/G Blowdown Processing Monitoring System	1 x 10^{-5} to 1 x 10^{-2} uCi/cc
R-20 (A,B)	Service Water Leaving Containment Monitoring System	1 x 10^{-5} to 1 x 10^{-2} uCi/cc
R-21	Vent Stack Monitoring System	1 x 10^{-9} to 1 x 10^{-6} uCi/cc
R-22	Vent Gas Monitoring System	5 x 10^{-7} to 1 x 10^{-4} uCi/cc

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Channel	Description	Range
R-23 (A,B)	Steam Generator Blowdown Processing Monitoring System	1 x 10^{-6} to 1 x 10^{-3} uCi/cc
R-24 (A,B)	Containment Purge Monitoring System	1 x 10^{-6} to 1 x 10^{-3} uCi/cc
R-25 (A,B)	Fuel Handling Monitoring System	1 x 10^{-6} to 1 x 10^{-3} uCi/cc
R-26 (A,B)	Recycle and Waste Evaporator Auxiliary Steam Supply System	1.0x10^{-6} to 1.0 x 10^{-3} uCi/cc

3. High Range Radiation Monitors

Channel	Description	Range
R-15B	Condenser Air Ejector Exhaust Monitoring System	.01 - 100 mR/hr
R-15C	Condenser Air Ejector Exhaust Monitoring System	.01 - 1000 R/hr
R-27 (A,B)	Containment High Range Monitoring System	1 to 10^7 R/hr
R-29B	Plant Vent Stack High Range Monitoring System	Per FSAR Table 11.4-2 and FSAR section 11.4.2.20
R-60A	A Steam Generator Relief & Safety Valve Monitoring System	Per FSAR Table 11.4-2 and FSAR section 11.4.2.20
R-60B	B Steam Generator Relief & Safety Valve Monitoring System	Per FSAR Table 11.4-2 and FSAR section 11.4.2.20
R-60C	C Steam Generator Relief & Safety Valve Monitoring System	Per FSAR Table 11.4-2 and FSAR section 11.4.2.20
R60D	T.D. Aux. Feedwater Pump Steam Exhaust Monitoring System	Per FSAR Table 11.4-2 and FSAR section 11.4.2.20

APPENDIX 4(D)

I. EMERGENCY PLAN PROCEDURES

A. Emergency Plan Implementing Procedures (EIP's) Listing

FNP-0-EIP-0.0	Emergency Organization
FNP-0-EIP-1.0	Duties of An Individual Who Discovers an Emergency Condition
FNP-0-EIP-2.0	Handling of Incoming Calls During Emergencies or Emergency Exercises
FNP-0-EIP-3.0	Duties of the Emergency Director
FNP-0-EIP-4.0	Health Physics Support to the Emergency Plan
FNP-0-EIP-5.0	Maintenance Support to the Emergency Plan
FNP-0-EIP-6.0	TSC Setup and Activation
FNP-0-EIP-7.0	Security Support to the Emergency Plan
FNP-0-EIP-8.0	Non-Emergency Notifications
FNP-0-EIP-8.1	Emergency Phone Directory
FNP-0-EIP-8.2	Plant Personnel Home Telephone Directory
FNP-0-EIP-8.3	Communications Equipment Operating Procedures
FNP-0-EIP-9.1	Automated Dose Assessment Method
FNP-0-EIP-9.3	Personal Computer Automated Dose Assessment Methods
FNP-0-EIP-9.5	Determining Technical Specifications/ODCM Radioactive Release Values
FNP-0-EIP-10.0	Evacuation and Personnel Accountability
FNP-0-EIP-11.0	Handling of Injured Personnel
FNP-0-EIP-13.0	Fire Emergencies
FNP-0-EIP-14.0	Personnel Movement, Relocation, Re-Entry and Site Evacuation
FNP-0-EIP-16.0	Emergency Equipment and Supplies
FNP-0-EIP-20.0	Chemistry and Environmental Support to the Emergency Plan
FNP-0-EIP-28.0	Termination and Recovery
FNP-0-EIP-30.0	Post Accident Core Damage Assessment

Emergency Plan Implementing Procedures (EIP's) – Continued...

NMP-EP-001	Corporate Emergency Response Organization (ERO)
NMP-EP-002	Duty Manager
NMP-EP-003	Web EOC Set Up and Use
NMP-EP-101	Emergency Operations Facility (EOF) Activation
NMP-EP-102	EOF Manager
NMP-EP-103	Licensing Support
NMP-EP-104	Dose Assessment
NMP-EP-105	EOF Technical Supervisor
NMP-EP-106	EOF Support Coordinator
NMP-EP-107	Security Coordinator
NMP EP-108	Offsite Response Coordinator
NMP-EP-110	Emergency Classification and Initial Actions
NMP-EP-111	Emergency Notifications
NMP-EP-112	Protective Action Recommendations
NMP-EP-201	Emergency Communications Administration
NMP-EP-202	Emergency Communications Organization Activation and Notification
NMP-EP-203	Corporate Media Center Operations
NMP-EP-204	Emergency News Center Operations
NMP-EP-205	Emergency Communications News Releases
NMP-EP-206	Emergency Communications News Briefings
NMP-EP-300	SNC Corporate Emergency Planning Conduct of Operations
NMP-EP-301	Emergency Response Organization Training
NMP-EP-302	MIDAS Computer Software Control
NMP-EP-303	Drill and Exercise Standards
NMP-EP-401	Emergency Management Guideline (EMG) Development and Maintenance
NMP-EP-402	Plant Farley Emergency Management Guideline (EMG)
FNP-0-EPP-1.0	Tone Alert Radio and Siren Operation
FNP-0- EPP-1.1	FNP Tone Alert Radio Distribution and Maintenance
FNP-0- EPP-1.2	ANS Testing and Maintenance

B. Radiation Control Procedures (RCP's)

FNP-0-RCP-7	Coordinated Exposure Reduction Program
FNP-0-RCP-13.1	Use of the HIS-20 RWP Section
FNP-0-RCP-25	Health Physics Activities During a Radiological Accident
FNP-0-RCP-29	Contamination Guidelines
FNP-0-RCP-29.1	Guidelines for Personnel Decon and Response to Personnel Contamination Events
FNP-0-RCP-862	Area and Equipment Decontamination Guidelines

C. Chemistry-Radiochemistry Control Procedures (CCP's)

FNP-0-CCP-1300	Chemistry and Environmental Activities during a Radiological Accident

D. Administrative Procedures (AP's)

FNP-0-AP-45	Farley Nuclear Plant Training Plan
NMP-AP-001	Development and Control of Nuclear Management Procedures

II. EMERGENCY PLAN/IMPLEMENTING PROCEDURE CROSS REFERENCE

The following listing indicates for each plan section the procedures that implement actions required by Southern Nuclear Operating Company.

PLAN SECTION	APPLICABLE IMPLEMENTING PROCEDURES
I. Introduction	N/A
II. Organization	
A. Onsite	
1. TSC	
a. Emergency Director	EIP-0 EIP-3
b. Operations Supervisor	EIP-0, 6
c. Maintenance Supervisor	EIP-0, 6 EIP-5, 6
d. Health Physics Supervisor	EIP-0, 6 EIP-4
e. Security Supervision	EIP-7
f. Engineering Supervisor	EIP-0, 6 EIP-6
g. Shift Supervisor (Emergency Director)	EIP-0, 3
h. Emergency Repair Party	EIP-5 EIP-14
i. Field Monitoring Team	EIP-4
j. Dose Assessment Staff	EIP-6 EIP-9 Series
k. Additional Plant Staff Assignments	
1) Operations Support Center (OSC) Manager	EIP-0
2) Radiological Monitoring	EIP-4
3) Fire Fighting and Rescue	EIP-13
4) First Aid	EIP-11
5) Decontamination	EIP-4
6) Personnel Accountability	EIP-10
7) Record Keeping	EIP-6
8) Communications	EIP-2, 8 Series EIP-3 NMP-EP-111

PLAN SECTION	APPLICABLE IMPLEMENTING PROCEDURES
B. Offsite	
1. Emergency Operations Facility (EOF)	
a. Corporate Duty Manager.............................	NMP-EP-001, 002
b. EOF Manager.................................	NMP-EP-101, 102
c. EOF Support Coordinator........................	NMP-EP-001, NMP-EP-106
d. EOF Technical Supervisor.............	NMP-EP-001, NMP-EP-105
e. Licensing Support Manager..............................	NMP-EP-001, 103
2. Emergency Communication Organization..............	NMP-EP-201 NMP-EP-202 NMP-EP-203 NMP-EP-204 NMP-EP-205 NMP-EP-206
3. Recovery Phase Organization...........................	EIP-28.0
a. Recovery Manager..................................	EIP-28.0 EIP-28.0
b. Recovery Support Director..........................	EIP-28.0
c. Technical Support Director..........................	EIP-28.0
d. Recovery Support Supervisor.........................	EIP-28.0
e. Administrative Support Supervisor.....................	EIP-28.0
f. Engineering Supervisor.............................	EIP-28.0
g. Licensing Supervisor................................	EIP-28.0

PLAN SECTION	APPLICABLE IMPLE-MENTING PROCEDURES
C. Outside Organizations	
1. Government Agencies	EIP-8.1, NMP-EP-111
a. Department of Energy Savannah River Operations Office	NMP-EP-110
b. Nuclear Regulatory Commission	NMP-EP-110/111
c. State of Alabama	NMP-EP-111
d. State of Georgia..............................	NMP-EP-111
e. State of Florida	NMP-EP-111
f. Houston County, Alabama.........................	NMP-EP-111
g. Early County, Georgia..........................	NMP-EP-111
h. City of Dothan, Alabama Fire Department.........	EIP-13 NMP-EP-110
2. Contractor and Private Offsite Organizations	
a. Southern Company Services......................	N/A
b. Bechtel Power Corporation......................	N/A
c. Westinghouse................................	N/A
d. INPO, NEI, EPRI...............................	N/A
e. Maintenance Assistance.........................	N/A
f. Radiological Monitoring Assistance..........	N/A
g. Other Utilities................................	N/A
III. Facilities and Equipment	
A. Control Centers	
1. Technical Support..................................	EIP-0 EIP-6
2. Emergency Operations Facility.......................	NMP-EP-101
3. Operations Support Center...........................	EIP-0 EIP-10
4. Emergency News Center..................................	NMP-EP-204
5. Corporate Media Center...................	NMP-EP-203
B. Communications Systems	
1. Commercial Telephones..............................	N/A
2. Private Automatic Exchange..........................	N/A
3. Microwave..	N/A
4. APC Load Dispatch Computer Link.....................	N/A
5. Two-Way Radio......................................	EIP-8.3
6. Public Address and Party Lines......................	EIP-8.3
7. Sound Powered Telephone.............................	N/A
8. Plant Emergency Alarm..............................	N/A
9. NRC Emergency Notification System...................	EIP-8.3
10. NRC Health Physics Network..........................	EIP-8.3
11. State/Local Agency Emergency Notification Network....	EIP-8.3
12. RSCL...	N/A
13. PMCL...	N/A
14. MCL...	N/A
15. LAN..	N/A
16. Telecopier...	EIP-8.3
17. SNC Integrated Data Display System..............	N/A
18. ERDS...	EIP-8.3
19. Other Communication Systems.........................	EIP-8.3 NMP-EP-003

PLAN SECTION	APPLICABLE IMPLE-MENTING PROCEDURES
C. Assessment Facilities	
1. Onsite Systems and Equipment	
a. Natural Phenomena Monitors	N/A
b. Radiological Monitors..............................	EIP-16 EIP-30
c. Post Accident Sampling Facilities..................	FNP-0-CCP-1300
d. Fire Detection	N/A
2. Environs Monitoring Facilities and Equipment..........	RCP-25 M-007 EIP-9 Series
D. Protection, Decontamination and First Aid Facilities	
1. Protective Facilities and Equipment..................	EIP-10
2. Decontamination and First Aid	EIP-11
3. Medical Transportation	EIP-11
4. Medical Treatment....................................	N/A
IV. Assessment Actions and Protective Measures	
A. Classification of Emergencies.	NMP-EP-110
1. Notification of Unusual Event........................	NMP-EP-110
2. Alert..	NMP-EP-110
3. Site Area Emergency Alert............................	NMP-EP-110
4. General Emergency Alert.............................	NMP-EP-110
B. Post Accident Assessment Actions	
1. Reactor Coolant Sampling, Containment Atmosphere Sampling and Plant Vent Stack Sampling Alert..........	EIP-20 CCP-1300 EIP-30
2. Surveillance of Control Room Monitors Alert...........	EIP-6
3. In-Plant and Site Surveys Alert......................	EIP-4 RCP-25
4. Population Exposure..................................	
5. Environs Surveys and Monitoring	
a. Short Term Assessment Exposure.....................	EIP-4 EIP-9 Series RCP-25
b. Long Term Assessment............................	EIP-9.3

PLAN SECTION	APPLICABLE IMPLE-MENTING PROCEDURES
C. Protective Actions and Emergency Action Levels	
1. Onsite Protective Action	
a. Evacuation	EIP-10
b. Personnel Accountability	EIP-7 EIP-10
c. Contamination and Exposure Control Measures......	EIP-4 EIP-7 EIP-10 EIP-11 EIP-14 RCP-6 RCP-7 RCP-13.1 RCP-29 RCP-29.1 RCP-862
2. Offsite Protective Action................................	NMP-EP-111 NMP-EP-112
a. Classification of Offsite Incidents..................	NMP-EP-110
b. Response	EIP-3 NMP-EP-110
V. Activation of Emergency Organization	
A. Declaration of an Emergency	NMP-EP-110
B. Onsite Organization Activation	NMP-EP-110
1. Technical Support Center Activation	EIP-6 EIP-8.1
2. Operations Support Center Activation	EIP-0, 6 EIP-7 EIP-10
C. Offsite Corporate Organization Activation	NMP-EP-101 NMP-EP-202
D. Offsite Local, State and Federal Agencies	N/A
VI. Notification Procedures	
A. State and Local Agency Notification	EIP-8.1 NMP-EP-111
B. Plume Exposure Pathway Planning Zone Public Notification and Information	
1. Notification	N/A
2. Information	N/A
3. News Release Coordination and Rumor Control.	NMP-EP-201 NMP-EP-205/206
C. NRC Office of Inspection and Enforcement	NMP-EP-110/111
D. Savannah River Operations Office	EIP-8.1
E. Medical	EIP-8.1 NMP-EP-110
F. Fire	EIP-8.1 NMP-EP-110 AP-37

PLAN SECTION	APPLICABLE IMPLE-MENTING PROCEDURES
VII. Recovery	
A. Methodology	EIP-28.0
B. Organization	EIP-28.0
C. Notification	EIP-28.0
VIII. Maintaining Emergency Preparedness	
A. Exercises and Drills	NMP-EP-300 NMP-EP-303
B. Training	AP-45 NMP-EP-301 FNP Security Plan
C. Inspection, Calibration and Testing of Emergency Equipment and Supplies..................................	EIP-8.3 EIP-15 EIP-16 NMP-EP-300
D. Review and Updating of the Plan and Procedures	NMP-EP-300

APPENDIX 5(E)

EVACUATION TIME ESTIMATES FOR THE FARLEY NUCLEAR PLANT

In order to ensure the safety of the public living in the vicinity of nuclear power plants in the nation, the U.S. Nuclear Regulatory Commission (NRC) requires the plants to update their evacuation times estimates (ETEs) within the 10-mile radius emergency planning zone (EPZ) as local conditions change (e.g., significant changes in population, change in the type of effectiveness of public notification system, etc.).

In 2007, Southern Nuclear Operating Company (SNC) contracted IEM to update estimates of evacuation times for the projected 2010 populations within the 10-mile emergency planning zone (EPZ) surrounding the Joseph M. Farley Nuclear Plant (FNP). The following information describes the methods used to obtain population data and to estimate evacuation times. It also reports the estimated population figures, evacuation road network information, and evacuation time estimates (ETEs).

In compliance with the NRC's and Federal Emergency Management Agency's (FEMA) *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (NUREG-0654) guidelines, the population is broken down by protective action zone (PAZ) and by sector.[1] Three categories of population have been identified in this report: permanent residents, transient, and special facilities. The permanent resident population is made up of individuals residing in the 10-mile EPZ. The transient population consists of workers employed within the area, recreational sportsmen, and visitors to the area.

IEM used PTV Vision VISUM—a computer traffic simulation model—to perform the ETE analyses. For the analyses, the 10-mile EPZ was divided into eleven geographic areas based on the four 90-degree sectors and two-mile, five-mile, and ten-mile radius rings. A total of 66 evacuation scenarios were considered as part of this study to represent different temporal and weather conditions. In order to represent the most realistic emergency scenarios, evacuations for the eleven geographic evacuation areas were modeled individually for the Weekday, Weeknight, and Weekend scenarios. Each of these scenarios was then considered under both normal and adverse weather conditions for 2010 population projections.

ETEs for 2010 normal weather conditions ranged from 1 hour 15 minutes to 3 hours 5 minutes. ETEs for 2010 adverse weather conditions ranged from 1 hour 25 minutes to 3 hours 20 minutes. The factors that contributed to the variations in ETEs between scenarios include differences in the number of evacuating vehicles, the capacity of the evacuation routes used, the type of warning systems within the zones, and the distance from the origin zones to the EPZ boundary.

Based on the data gathered and the results of the evacuation simulations, the existing evacuation strategy is functional for the 2010 conditions, given the lack of severe congestion or very high ETEs. The evacuation time study follows this summary.

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1 NRC and FEMA. *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.* NUREG-0654, FEMA-REP-1. November 1980. Online: http://www.nrc.gov.edgesuite.net/reading-rm/doc-collections/nuregs/staff/sr0654/sr0654r1.pdf (last accessed November 29, 2007).

Introduction

The Joseph M. Farley Nuclear Plant, also known as Farley Nuclear Plant (FNP), is owned by Alabama Power and operated by Southern Nuclear Operating Company (SNC). In order to ensure the safety of the public living in the vicinity of the power plant, the U.S. Nuclear Regulatory Commission (NRC) requires nuclear power plants in the nation to conduct evacuation studies for the population within the 10-mile radius emergency planning zone (EPZ) at regular intervals. This population evacuation study fulfills regulatory requirements outlined in the NRC's and Federal Emergency Management Agency's (FEMA) Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (NUREG-0654), Appendix 4.[2]

SNC contracted IEM to perform a population evacuation study for the 10-mile radius EPZ surrounding FNP. This appendix presents the results of that study. It describes the assumptions and methodologies used by IEM to obtain population and evacuation network data and to perform evacuation time estimates (ETE) analyses. ETEs in this evacuation study incorporate the projected population numbers for the year 2010. This appendix reports the updated population figures, evacuation road network information, and ETEs.

The study is consistent with the requirements specified in Appendix 4 of NUREG-0654. When appropriate, the study uses guidance contained in NUREG/CR-6863 and NUREG/CR-6864, Volume 1.3,4 The study is intended to provide information for State, local, and FNP emergency management personnel to effectively plan for an accidental event at the plant.

Site Location

FNP is located on the western bank of the Chattahoochee River in the northeastern corner of Houston County, Alabama. The City of Blakely, Georgia is approximately 14 miles northeast of the plant and is the nearest significant population center from the plant. The City of Dothan, Alabama is approximately 15 miles west of the plant. Figure 1 shows the location of the FNP site.

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2 NRC and FEMA. *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants.* NUREG-0654, FEMA-REP-1. November 1980. Online: http://www.nrc.gov.edgesuite.net/reading-rm/doc-collections/nuregs/staff/sr0654/sr0654r1.pdf (last accessed November 29, 2007).
3 NRC. *Development of Evacuation Time Estimate Studies for Nuclear Power Plants.* NUREG/CR-6863. January 2005. Online: http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr6863/cr6863.pdf (last accessed November 29, 2007).
4 NRC. *Identification and Analysis of Factors Affecting Emergency Evacuations Emergency Evacuations,* Volume 1. NUREG/CR-6864. January 2005. Online: http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr6864/v1/cr6864v1.pdf (last accessed November 29, 2007).

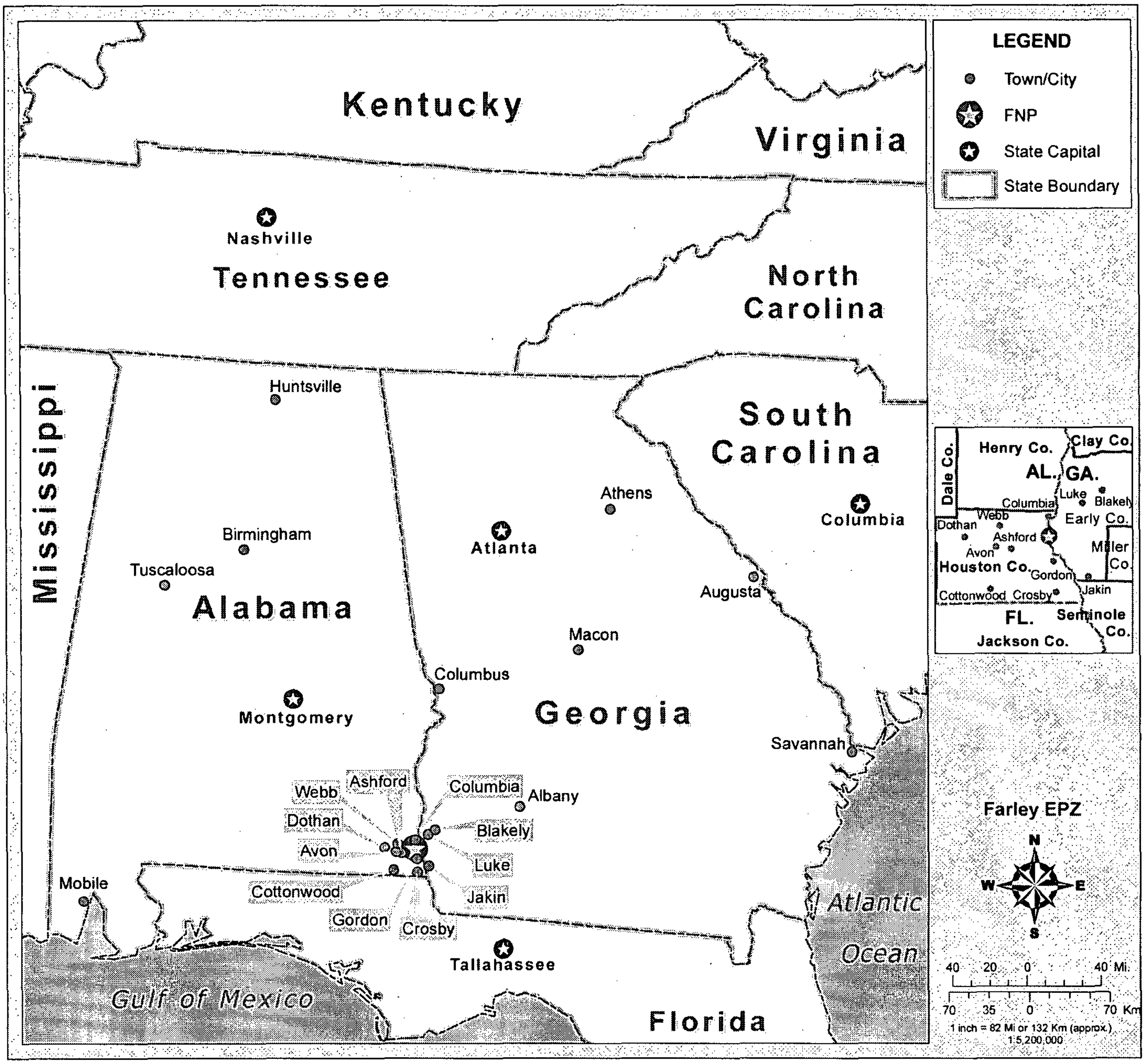

FIGURE 1: FARLEY NUCLEAR PLANT SITE LOCATION

Emergency Planning Zone

The plume exposure pathway EPZ includes the majority of the 10-mile geographic area surrounding FNP. The land within the plume exposure pathway is divided by the Chattahoochee River. The FNP EPZ covers portions of Houston and Henry counties in Alabama, and Early County in Georgia. The EPZ is primarily a rural farming and lumber harvesting area. Transient population in the EPZ is minimal with the exception of recreational users along the Chattahoochee River, and hunters.

NUREG-0654 recommends that the EPZ be subdivided into evacuation areas, for performing the evacuation time estimate analyses (see Table 1).[5]

TABLE 1: EVACUATION AREAS FOR ETE ANALYSIS

Radius	Area
Approximately 2 miles	**Four 90° sectors**
Approximately 5 miles	**Four 90° sectors**
Approximately 10 miles (EPZ)	**Four 90° sectors**
Approximately 10 miles (EPZ)	**Entire EPZ**

The State of Georgia and State of Alabama Radiological Emergency Plans (REPs) define the geographical and political boundaries of the EPZ. Based on the geographic and political boundaries in the EPZ, one 0–2-mile area, four 0–5-mile areas, and four 0–10-mile areas were identified. For evacuation and emergency response planning purposes, these areas have been further divided into 19 protective action zones (PAZs).[6] The zone descriptions were obtained and verified from the FNP's 2007 public outreach calendar[7], county radiological response plans[8], and discussions with SNC and plant representatives. The zones were selected based on existing political boundaries and prominent physical features, either natural (e.g., rivers and lakes) or manmade (e.g., roads), to enhance direction and coordination of the public in the affected area.

5 NUREG-0654. p. 4-4.
6 Protective Action Zone is also referred to as "Zone" in this document.
7 2007 Joseph M. Farley Nuclear Plant Emergency Information Calendar.
8 State of Georgia REP Plan, Blakely-Early County Plan: *Blakely-Early County Emergency Management Agency Radiological Emergency Plan for Nuclear Incidents/Accidents Involving the Joseph M. Farley Nuclear Power Plant*, February 2004, p. D-2, D-11; Dothan-Houston County Emergency Management Agency, *Standard Operating Guidelines for Joseph M. Farley Nuclear Power Plant Incidents*, p. C-5, C-6.

Figure 2 is a map of the evacuation zones for FNP. Appendix A of this document contains boundary descriptions of the zones within the 10-mile EPZ of the plant.

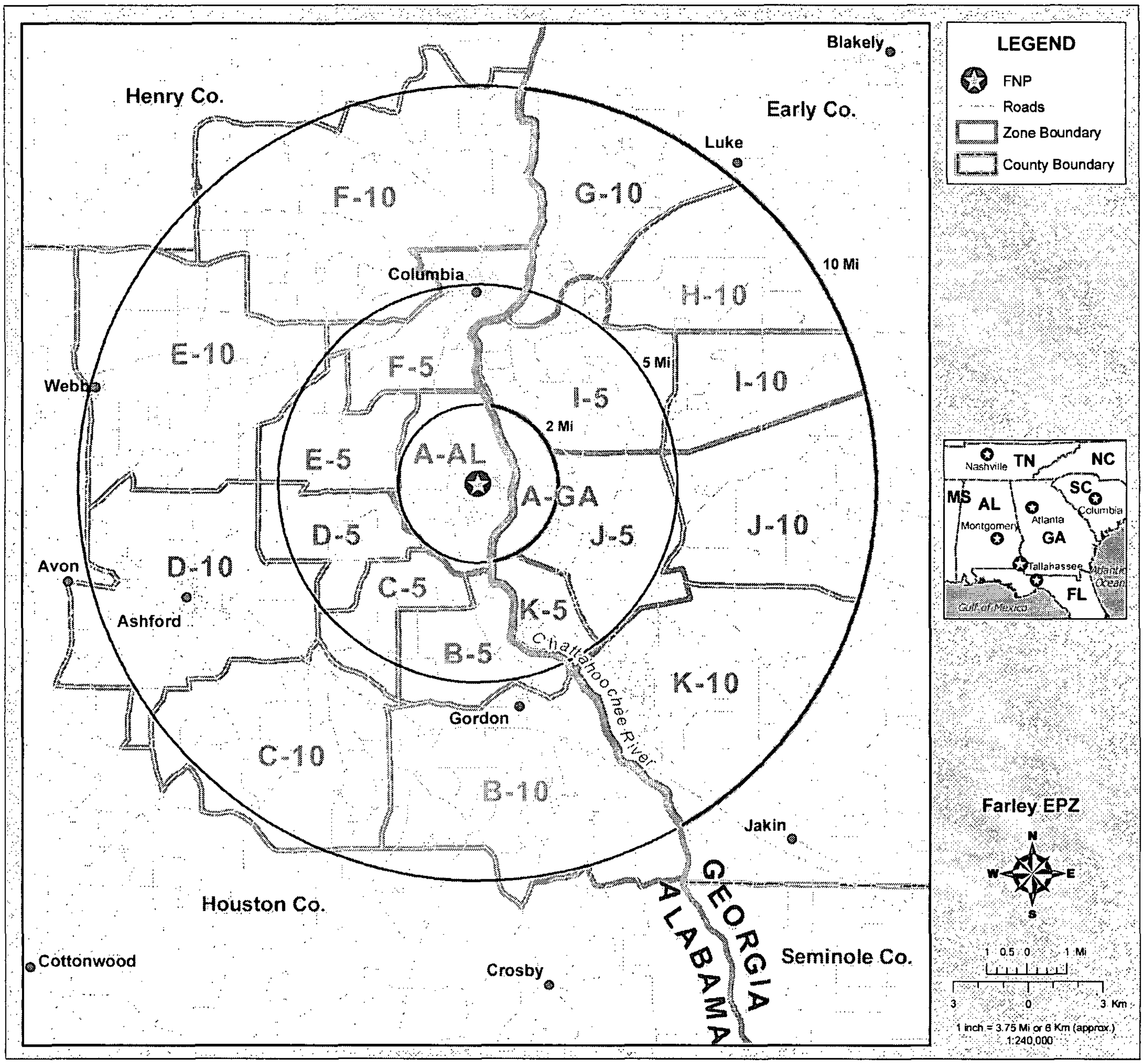

FIGURE 2: FNP EPZ BOUNDARY AND PROTECTIVE ACTION ZONES

The relationship between the evacuation areas and zones is summarized in Table 2.

TABLE 2: SUMMARY OF EVACUATION AREAS AND PROTECTIVE ACTION ZONES

Evacuation Area	Zones
0-2 Miles	A
0-5 Miles, SW	A, B-5, C-5, D-5
0-5 Miles, NW	A, E-5, F-5
0-5 Miles, NE	A, I-5
0-5 Miles, SE	A, J-5, K-5
0-5 Miles	A, B-5, C-5, D-5, E-5, F-5, I-5, J-5, K-5
0-10 Miles, SW	A, B-5, C-5, D-5, B-10, C-10, D-10
0-10 Miles, NW	A, E-5, F-5, E-10, F-10
0-10 Miles, NE	A, I-5, G-10, H-10, I-10
0-10 Miles, SE	A, J-5, K-5, J-10, K-10
0-10 Miles, Full EPZ	All 19 Evacuation Zones

Assumptions and Methodology

General Assumptions

IEM made the following general assumptions to model the population evacuation study:

- The ETEs include the times associated with warning diffusion, public mobilization, and travel time out of the EPZ.
- Following initial notification, all persons within the EPZ will evacuate. Evacuation of the EPZ will be considered complete after all evacuating vehicles are outside the EPZ.
- Existing lane utilization patterns will prevail during the course of the evacuation. There will be traffic control points (TCPs) in the network to allow efficient flow of traffic toward the reception centers.
- Reception centers are modeled as defined in the 2007 public outreach calendar.
- All households having more than one vehicle will only use one automobile. This is consistent with empirical data, which indicates that family members, when possible, prefer to evacuate as a unit.[9]
- Non-auto-owning households will evacuate with neighbors, friends, and relatives, or will be evacuated through coordinated efforts by State and county emergency management officials. This is also consistent with the 2007 public outreach calendar. For evacuation modeling purposes, it is assumed that one vehicle will be made available to evacuate each household of this population segment.
- To model the population evacuation during adverse weather conditions, speed limits are reduced by 40%, and road capacities are reduced by 25%. This is consistent with research that concludes that during adverse weather conditions, drivers may reduce their velocity by nearly 40%, which can result in a 25–30% reduction in capacity.[10] Weather-related capacity reductions of 20–25% are generally used in current evacuation studies for bad weather roadway conditions.[11]

Methodology

IEM used PTV Vision VISUM, a computer simulation model, to perform the ETEs for the FNP site.12 PTV Vision is the leading software suite for transportation planning and operations analyses used in more than 70 countries. Detailed information on the evacuation time analysis methodology using PTV Vision is provided in Section 0. PTV Vision quality assurance and industry acceptance information is provided in Appendix C

9 R.W. Perry, M.K. Lindell, M.R. Greene. *Evacuation Planning in Emergency Management.* 1981.
10 National Research Council, Committee on Weather Research for Surface Transportation. *Where the Weather Meets the Road: A Research Agenda for Improving Road Weather Services;* Transportation Research Board (TRB), Board on Atmospheric Services. 2004.
11 Urbanik, T. E. and J. D. Jamison, *State of the Art in Evacuation Time Estimate Studies for Nuclear Power Plants* (NUREG/CR-4831; PNL-7776). Richland, WA: Pacific Northwest Laboratory, 1992. Page 5.
12 PTV Vision can be found online at http://www.ptvamerica.com.

Sources of Data

The most up-to-date data sources were reviewed and analyzed to prepare appropriate input data for running the traffic simulation and providing the best ETEs. These data sources are explained below:

- Population estimates were based on data obtained from Synergos Technologies, contact with individual facilities, and discussions with the SNC emergency planning staff.[13]
- The peak estimated employment level at the plant reflects office or operations personnel.
- Roadway geometric data was obtained from PTV. PTV data is based on high-quality, regularly updated, NAVTEQ street network data. NAVTEQ networks are detailed and include neighborhood streets in every community in North America. This data was validated by IEM during a "ground truthing" field trip in November 2007.
- Roadway and intersection approach capacities were calculated using the concepts and procedures defined in the Highway Capacity Manual.[14]
- Warning diffusion and mobilization times were based on the data presented in Evaluating Protective Actions for Chemical Agent Emergencies.[15] This data was collected during evacuations executed in response to large-scale chemical spills, and it explicitly incorporates the time required for communication of the warning (warning diffusion) and the time required for an individual to respond to the warning (mobilization). The data collected in this meta-study were based on transient, permanent, and special populations.
- Vehicle occupancy rates for the different population categories were derived based on average household size and discussions with the counties' and plant's emergency planning staffs.

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13 Synergos Technologies, Inc. Online: http://www.synergos-tech.com.
14 Transportation Research Board, National Research Council. *Highway Capacity Manual.* Washington, D.C. 2000.
15 Rogers, G. O., et al., *Evaluating Protective Actions for Chemical Agent Emergencies* (ORNL-6615). Oak Ridge, TN: Oak Ridge National Laboratory, 1990.

Scenarios Modeled

In accordance with NUREG-0654 guidelines, ETEs for each of the evacuation areas (refer to Table 2) have been prepared for several temporal and weather conditions. Based on the discussion with the SNC emergency planning staff, estimates have been prepared for weekday normal and adverse weather conditions, weeknight normal and adverse weather conditions, and weekend normal and adverse weather conditions.

Normal weather refers to conditions where roads are clear and dry and visibility is not impaired. Adverse weather refers to rainy or snowy conditions where road capacities are reduced by 25% and speed limits are reduced by 40%.

Evacuation conditions are modeled for the populations of the year 2010. Table 3 presents the snapshot of the ETE scenarios that were modeled for the study.

TABLE 3: ETE SCENARIOS MODELED

Normal Weather	Adverse Weather
Weekday	**Weekday**
Weeknight	**Weeknight**
Weekend	**Weekend**

The various population components for different scenarios are summarized below:

- Weekday: This situation represents a typical weekday period when the workforce is at a full daytime level. Assumptions on the population levels for this condition include the following:
  - Permanent residents within the EPZ will evacuate from their places of residence.
  - The plant site employment is at an estimated peak daytime level.
  - Workplaces are fully staffed at daytime levels.
  - Schools are in session.
  - Recreational activities, such as hunting and fishing, are at daytime levels.
- Weeknight: This situation reflects a typical nighttime period when the workforce is at a nighttime level. Assumptions on the population levels for this condition include the following:
  - Permanent residents within the EPZ will evacuate from their places of residence.
  - The plant site is staffed at an estimated peak nighttime level.
  - Workplaces are at nighttime levels.
  - Schools are closed.
  - There are no recreational (hunting and fishing) activities.

- Weekend: The weekend situation represents a daytime period when recreational activities are at peak levels. This condition would most likely occur during any weekend day during the hunting season. Assumptions on the population levels for this condition include the following:
    - Permanent residents within the EPZ will evacuate from their places of residence.
    - The plant site is at an estimated peak weekend level.
    - Workplaces are at weekend levels.
    - Schools are closed.
    - Recreational (hunting and fishing) activities are at a peak estimated level.

Population and Vehicle Demand Estimation

IEM identified three population categories within the EPZ surrounding FNP, as specified in the NUREG-0654 guidelines. These populations include the permanent resident population, the transient population, and the special facility population. The permanent resident population is made up of individuals residing in the 10-mile EPZ. The transient population is composed of individuals working and/or visiting within the EPZ but not living there. For instance, the transient population consists of workers employed within the area, recreational sportsmen, and visitors to the area. Special facility populations may require additional consideration in the event of an evacuation. For the purpose of this study, only special facilities holding populations of more than fifty people are considered under the special facility category. Facilities with less than fifty people are considered under the transient population category.

FNP is located in a rural area of Alabama. There are no concentrated population centers, and there is minimal transient population with in the 10-mile EPZ. There are several types of special facilities within the EPZ, including seven schools and five major employers including the plant itself. The majority of the population consists of permanent residents and workers.

IEM derived the 2010 permanent population estimates from 2007 third-quarter population estimates and the 2012 population forecast obtained from Synergos Technologies, Inc. Local school data was obtained through contact with individual facilities. The recreational visitors' population figures were based on discussions with the FNP's emergency planning staff, and staff contact with individual parks. After discussion with the appropriate facilities and the site emergency planning personnel, it was estimated that the 2007 school and recreational user information applies to the year 2010 since no major change in the land use patterns within the EPZ is expected in the next three years. These population estimates formed the basis for determining the evacuee demand used in the analysis for any given evacuation scenario. The populations from these sources were assigned to each applicable zone.

Permanent Residents

IEM used GIS software to process the geographic data and associated population counts for census blocks in each of the counties surrounding FNP. IEM then aggregated these populations over each zone to generate a permanent resident population count, which comprises the nighttime population.

To calculate population by each zone and radial sector, census block population was aggregated within each of the sectors. Since boundaries of the sectors do not follow census block boundaries, many of the blocks had to be divided into sub-areas based on sector boundaries. To do this, IEM overlaid the census blocks with the zones and 10-mile radius sectors. The blocks were then split into sub-areas and the block population was allocated to sub-areas based on an area ratio method. The populations of the block sub-areas within the sector boundaries were then aggregated for each radius sector.

The area ratio method assigns each sub-area a portion of the block population based on the ratio of the area of each block part to the area of the entire block. For example, if a particular sub-area contains one-fourth the area of the total block area, the sub-area receives one-fourth of the block's total population. Figure 3 illustrates this principle, in which one-fourth of the total area is located in the sub-area, which includes one-fourth of the population. The area ratio method assumes that the population within the block is evenly distributed, a reasonable assumption in most cases.

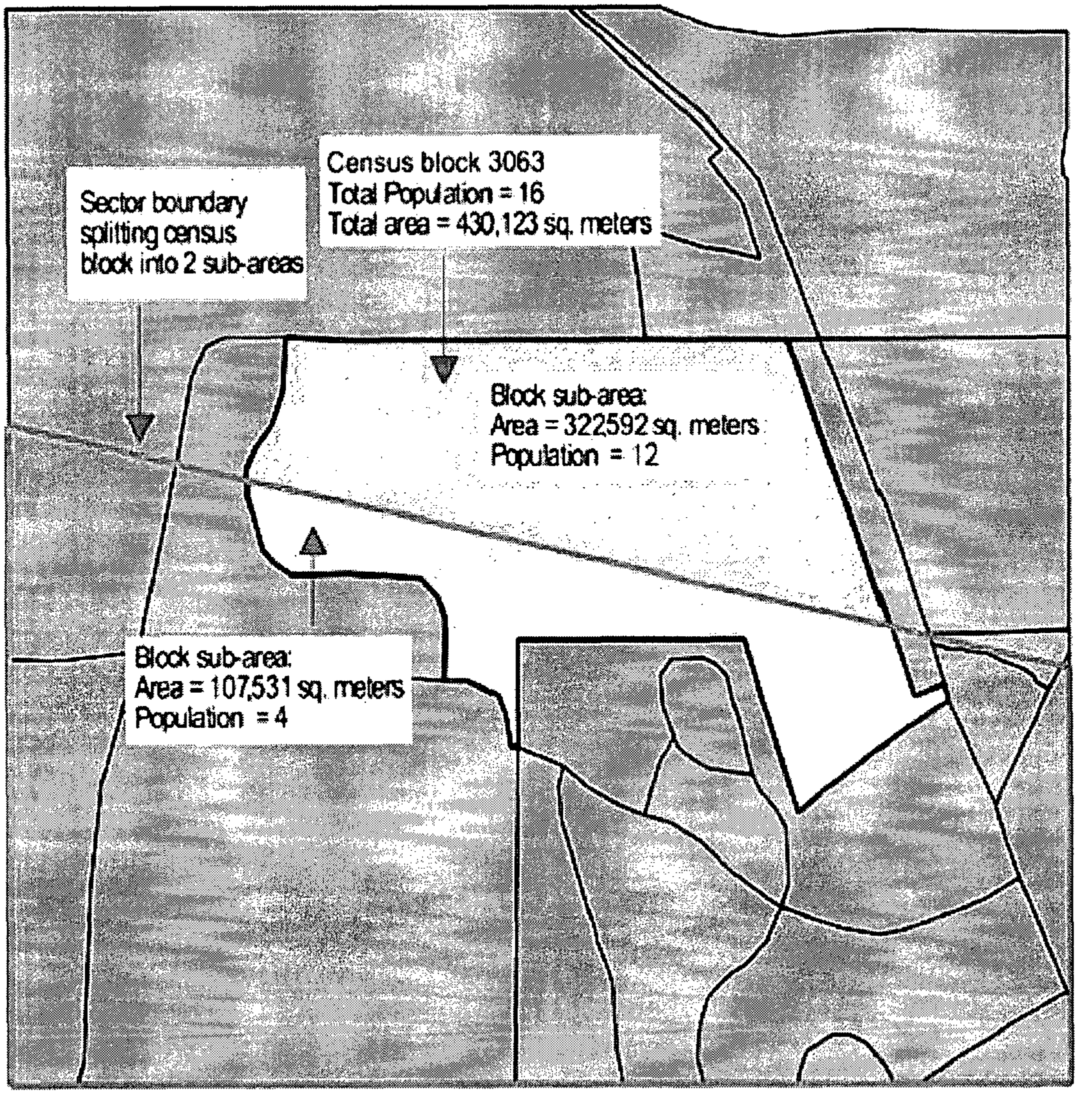

FIGURE 3: AN EXAMPLE OF THE AREA RATIO METHOD APPLIED TO A CENSUS BLOCK DIVIDED INTO SUB-AREAS

The populations of the block sub-areas within the sector boundaries were then aggregated for each sector. This method was also used in the few instances in which the zone boundaries did not follow block boundaries, making it necessary to split blocks along a particular zone boundary.

Additionally, the permanent resident population is divided into auto-owning and non-auto-owning populations.

Auto-Owning Population

It was assumed that one vehicle would evacuate from each permanent resident household. This assumption is consistent with the research indicating the tendency of evacuees to evacuate, where possible, as a family unit.16 The population projections and estimates indicate that 92% of the households within the EPZ have at least one vehicle. The data also indicates an average household size of 2.5 persons for the FNP EPZ.

Non-Auto-Owning Population

The population projections and estimates indicate that 8% of the households within the EPZ do not own a vehicle. It is assumed that privately-owned vehicles of friends and/or relatives will be available to evacuate this population component. This assumption is used since it provides the most realistic representation of evacuation traffic generated from the non-auto-owning households. For an estimate of the vehicle demand associated with the non-auto-owning population, IEM assumed one vehicle would be made available to evacuate each household. This is based on the previously-stated assumptions that a family would use a vehicle from neighbors, friends, and relatives, or will be evacuated through coordinated efforts by county emergency management officials.[17]

Table 4 shows the distribution of the 2010 total permanent resident population by sector and ring, while Figure 4 presents the same data graphically. Table 5 shows the distribution of the permanent resident population by zone. Figure 5 presents this data graphically.

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16 R.W. Perry, M.K. Lindell, M.R. Greene. *Evacuation Planning in Emergency Management.* 1981.
17 2007 Joseph M. Farley Nuclear Plant Emergency Information Calendar; State of Georgia REP Plan, Blakely-Early County Plan, February 2004, p. H-1, H-2, J-3; Dothan/Houston County Emergency Management Agency, Standard Operating Guidelines for Joseph M. Farley Nuclear Power Plant Incidents, p. B-10, H-1, H-2.

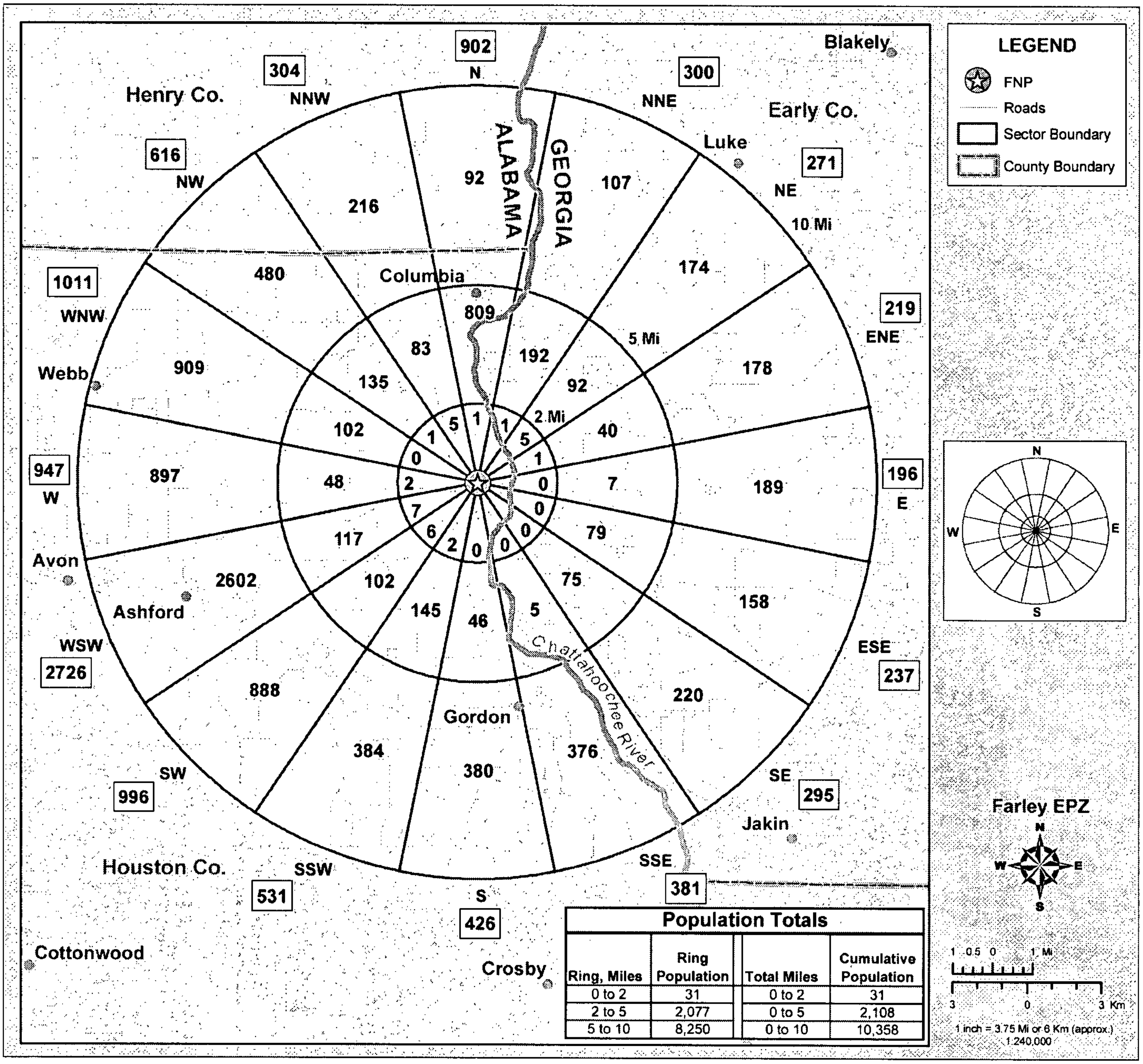
TABLE 4: 2010 PERMANENT RESIDENT POPULATION DISTRIBUTION BY SECTOR AND RING

Sector[18]	Ring[19]	Permanent Resident Population 2010
N	2	1
N	5	809
N	10	92
NNW	2	5
NNW	5	83
NNW	10	216
NW	2	1
NW	5	135
NW	10	480
WNW	2	0
WNW	5	102
WNW	10	909
W	2	2
W	5	48
W	10	897
WSW	2	7
WSW	5	117
WSW	10	2602
SW	2	6
SW	5	102
SW	10	888
SSW	2	2
SSW	5	145
SSW	10	384
S	2	0

18 There 48 sectors, each measured 22.5°. Sectors of 22.5°are designated by compass direction going outward from the plant on the centerline of the sector (e.g., the sector from 348.75° to 11.25° is designated "N" for north). The remaining sectors are designated NNW, NW, WNW, W, WSW, SW, SSW, S, etc.

19 Rings are defined as the area between two circles of radius 0 and 2 miles, 2 and 5 miles, and 5 and 10 miles.

Sector[19]	Ring[19]	Permanent Resident Population 2010
S	5	46
S	10	380
SSE	2	0
SSE	5	5
SSE	10	376
SE	2	0
SE	5	75
SE	10	220
ESE	2	0
ESE	5	79
ESE	10	158
E	2	0
E	5	7
E	10	189
ENE	2	1
ENE	5	40
ENE	10	178
NE	2	5
NE	5	92
NE	10	174
NNE	2	1
NNE	5	192
NNE	10	107



Population Totals			
Ring, Miles	Ring Population	Total Miles	Cumulative Population
0 to 2	31	0 to 2	31
2 to 5	2,077	0 to 5	2,108
5 to 10	8,250	0 to 10	10,358

FIGURE 4
2010 FNP SECTOR AND RING PERMANENT RESIDENT POPULATION MAP

TABLE 5: 2010 PERMANENT RESIDENT POPULATION DISTRIBUTION BY ZONES

Zone	Permanent Resident Population 2010
A-AL	24
A-GA	7
B-5	96
B-10	774
C-5	184
C-10	895
D-5	157
D-10	3421
E-5	162
E-10	1567
F-5	999
F-10	525
G-10	120
H-10	225
I-5	318
I-10	110
J-5	161
J-10	282
K-5	0
K-10	331

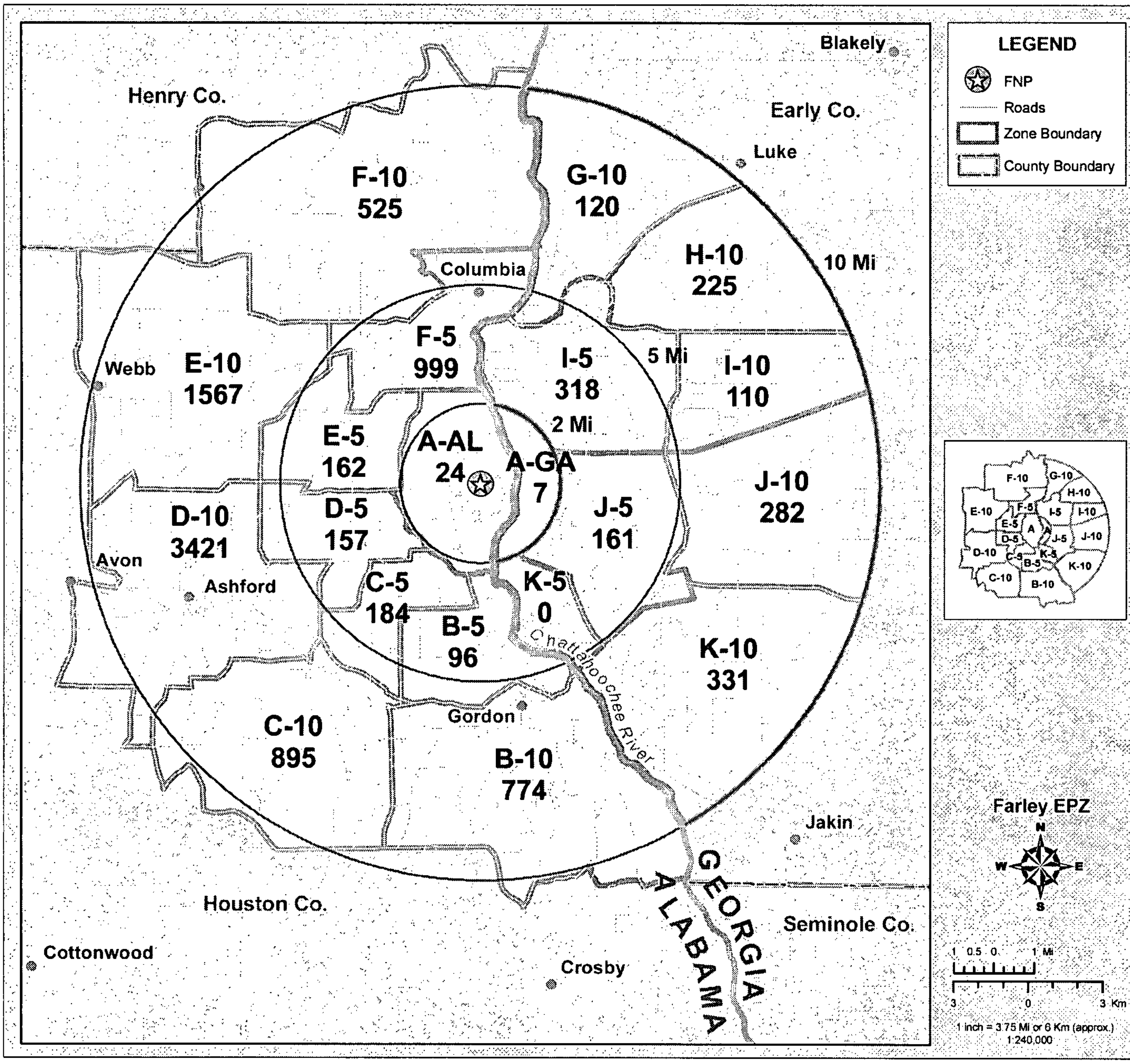


FIGURE 5:
2010 FNP ZONE PERMANENT RESIDENT POPULATIONS MAP

Transient Populations

The transient population of the FNP EPZ area is derived from employment data and data on recreation populations. The employment data was obtained from Synergos. These populations were combined with other contributors, such as the percentage of the population that is of working age, to daytime population estimations and assigned to population centroids in a manner similar to the permanent resident populations. The daytime populations incorporate employment and workforce information, such as county working-age population and unemployment statistics.

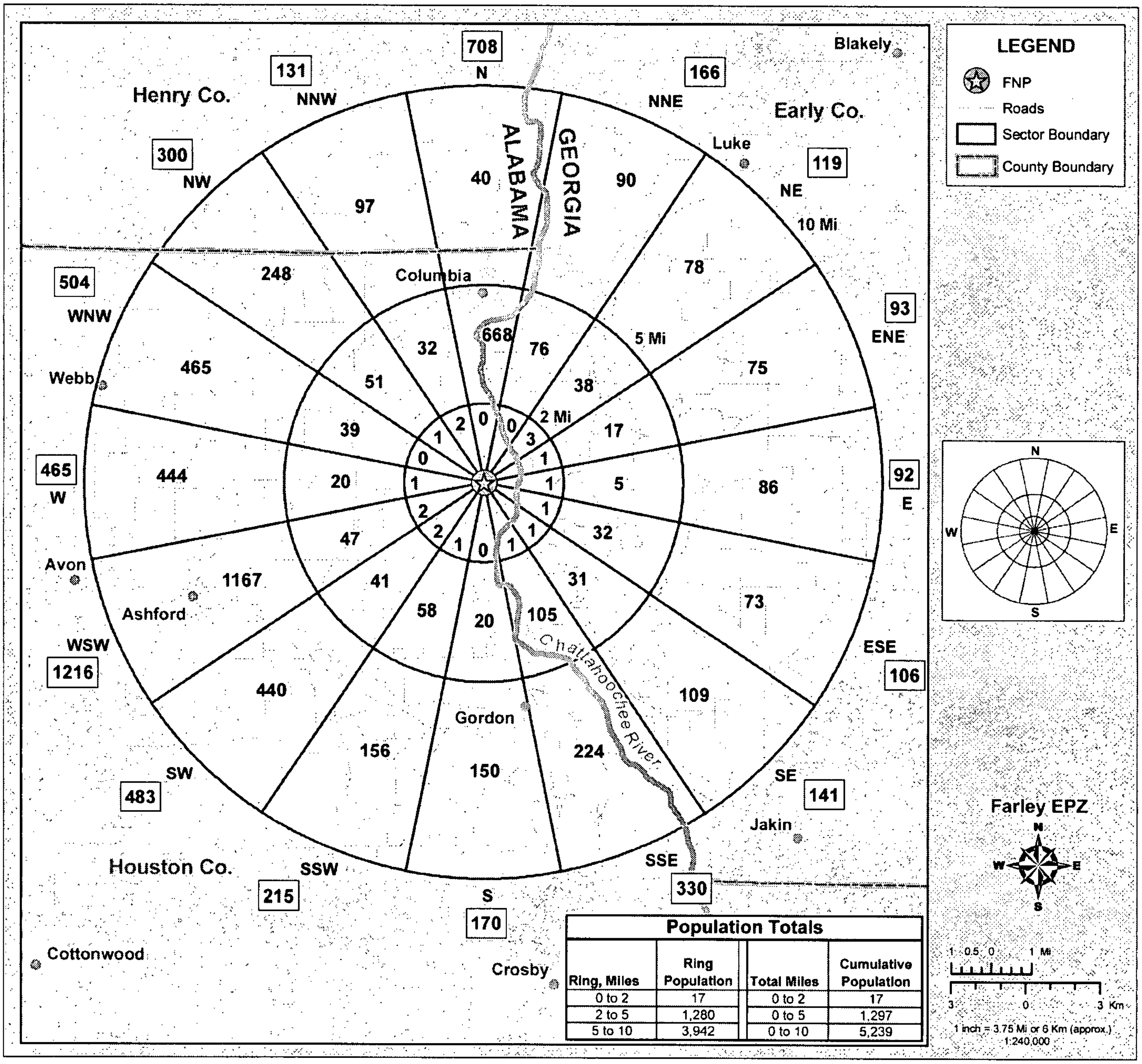
The recreational population shown for the FNP site considers users of parks and waterways, primarily boaters on the Chattahoochee River. Through conversations with FNP's emergency planning staff and with staff from the U.S. Fish and Wildlife Service's Mobile office, IEM estimated there will be approximately 120 hunters/boaters throughout the EPZ on weekdays during the hunting season and approximately 575 hunters/boaters on peak weekends during the hunting season. In addition, there will be approximately 20 picnickers /campers at parks during the weekdays, and 90 picnickers/campers on the weekends.

A vehicle occupancy rate of 1.5 was used to estimate the number of vehicles used by recreational area users, such as hunters and fishermen. Table 6 shows the distribution of the transient population by sector and ring, while Figure 6 presents the same data graphically. Table 7 shows the distribution of the transient population by zone. Figure 7 presents this data graphically.

TABLE 6:
TRANSIENT POPULATION DISTRIBUTION BY SECTOR AND RING

Sector	Ring	Transient Population
N	2	0
N	5	668
N	10	40
NNW	2	2
NNW	5	32
NNW	10	97
NW	2	1
NW	5	51
NW	10	248
WNW	2	0
WNW	5	39
WNW	10	465
W	2	1
W	5	20
W	10	444
WSW	2	2
WSW	5	47
WSW	10	1167
SW	2	2
SW	5	41
SW	10	440
SSW	2	1
SSW	5	58
SSW	10	156
S	2	0
S	5	20
S	10	150
SSE	2	1
SSE	5	105
SSE	10	224
SE	2	1

Secto r	Rin g	Transient Population
SE	5	31
SE	10	109
ESE	2	1
ESE	5	32
ESE	10	73
E	2	1
E	5	5
E	10	86
ENE	2	1
ENE	5	17
ENE	10	75
NE	2	3
NE	5	38
NE	10	78
NNE	2	0
NNE	5	76
NNE	10	90



Ring, Miles	Ring Population	Total Miles	Cumulative Population
0 to 2	17	0 to 2	17
2 to 5	1,280	0 to 5	1,297
5 to 10	3,942	0 to 10	5,239

Population Totals

FIGURE 6:
FNP SECTOR AND RING TRANSIENT POPULATIONS MAP

TABLE 7: TRANSIENT POPULATION DISTRIBUTION BY ZONES

Zone	Transient Population
A-AL	9
A-GA	8
B-5	141
B-10	321
C-5	73
C-10	421
D-5	64
D-10	1561
E-5	62
E-10	804
F-5	641
F-10	246
G-10	98
H-10	96
I-5	228
I-10	48
J-5	68
J-10	126
K-5	3
K-10	221

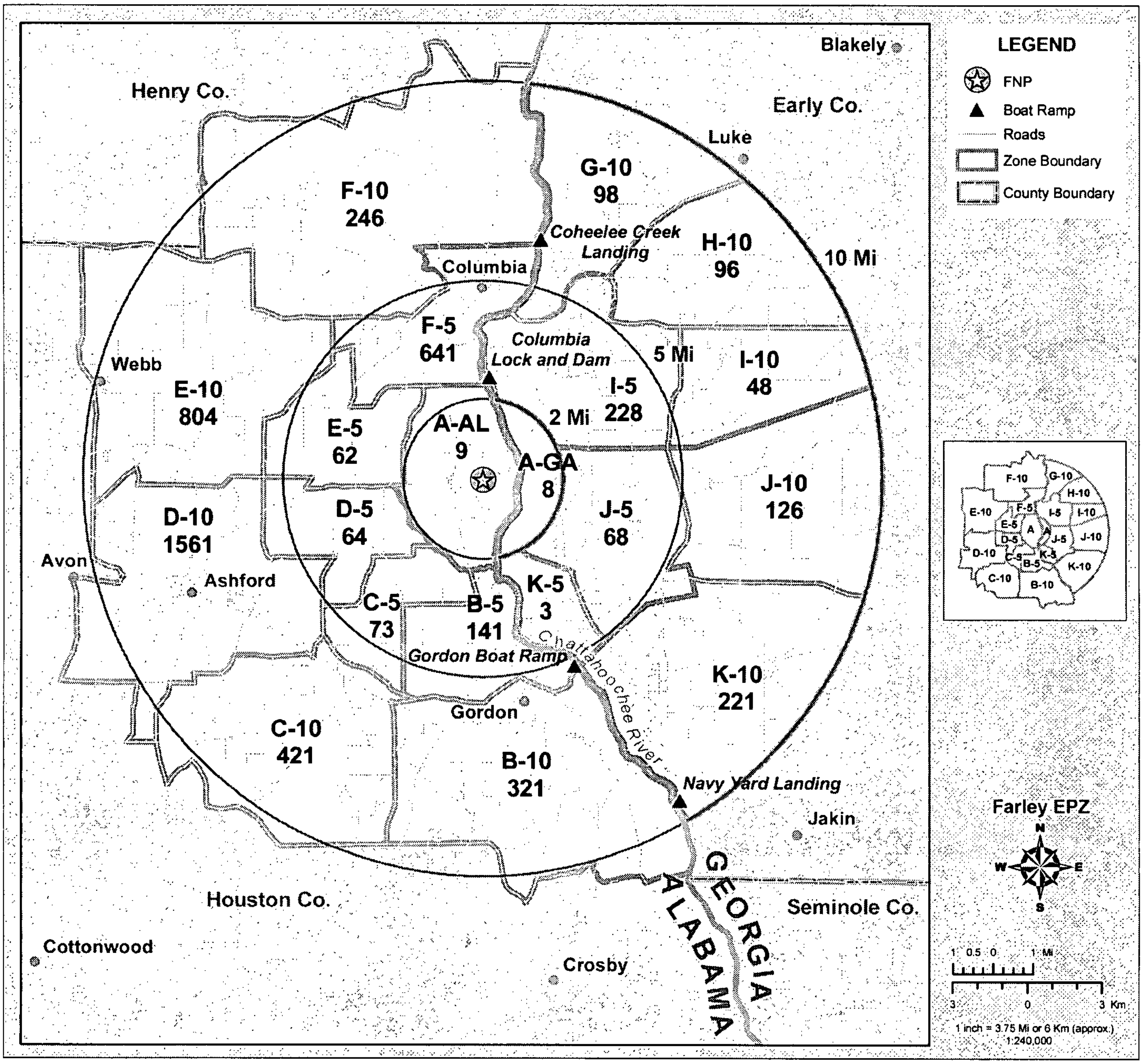


FIGURE 7:
FNP ZONE TRANSIENT POPULATIONS MAP

Special Facility Populations

IEM identified several special facilities within the EPZ, consisting of schools and major employers, including Farley Nuclear Plant (Table 8 and Table 9). The special facilities include the following:

- Five major employers (including FNP)
- Seven schools—combination of public and private

Table 8 shows the major employers' peak population. Table 9 shows the peak population of schools within the EPZ. Figure 8 presents the same data graphically.

TABLE 8: PEAK POPULATION OF MAJOR EMPLOYER

Facility Name	Address	County	Zone	Peak
Farley Nuclear Plant	7388 N State Hwy 95	Houston	A-AL	522[20]
Georgia-Pacific – Containerboard	12551 Hwy 273 W	Early	K-5	500
Republic Conduit	39832 Georgia Tubing Rd	Early	K-10	112
Qualico Steel	7797 E State Hwy 52	Houston	E-10	180
Amx Trucking	10720 E US Hwy 84	Houston	D-10	100

20 There are approximately 522 daytime employees and approximately 75 night and weekend employees. Approximately 200 employees may evacuate the facility during a daytime incident and it is possible that no one may evacuate during a nighttime or weekend incident.

TABLE 9: PEAK SCHOOL POPULATION

Facility Name	Address	County	Zone	Population (Children and Adults)
Ashford Elementary School	100 Barfield St	Houston	D-10	930
Ashford High School	607 Church St	Houston	D-10	880
Houston County High School	202 W Church St	Houston	F-5	486
Webb Elementary School	178 Depot St	Houston	E-10	534
Houston County Career And Technical Center	801 Eighth Ave	Houston	D-10	150
Camp E-Tu-Nake	313 E-Tu-Nake Place	Early	G-10	75
Ashford Academy	1100 N Broadway St	Houston	D-10	245

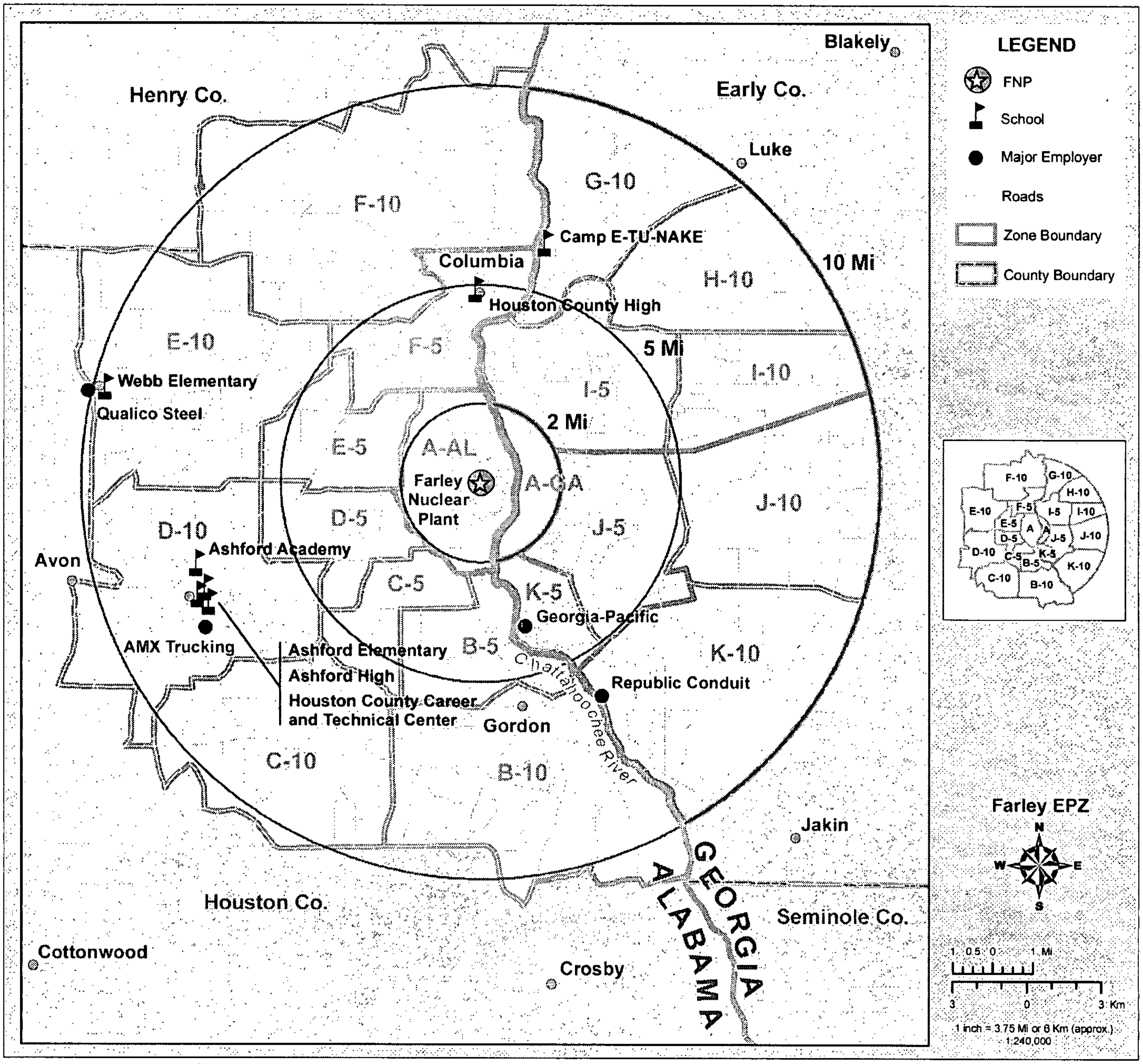


FIGURE 8: MAP OF SPECIAL FACILITIES WITHIN THE EPZ

Different vehicle occupancy rates (VORs) were used for the various categories of population (e.g., one vehicle per household for permanent; 1.5 people per vehicle for recreational area users). All transient populations were assumed to evacuate with a VOR of 1.25. A vehicle occupancy rate of 1.1 was used to estimate the number of vehicles to be evacuated by the FNP onsite population, as was discussed with SNC and plant emergency planning staff. After consultation with SNC emergency planners, students were assumed to evacuate via buses at a rate of 52 students per bus, with the remaining school population departing mostly in their own cars (occupancy rate of 1.25). Table 10 shows the VORs by different population categories used for the evacuation modeling.

TABLE 10: VEHICLE OCCUPANCY RATES BY POPULATION CATEGORIES

Population Category	Population Subtype		Vehicle Occupancy Rate
Permanent Residents	Auto-Owning Permanent		2.5
	Non-Auto-Owning Permanent		2.5
Transients	Work Force Transients		1.25
	Recreational Transients		1.5
Special Facilities	Schools	Students	52
		Staff	1.25
	Farley Nuclear Plant		1.1

The Evacuation Roadway Network

The evacuation routes were modeled based on the information provided in the FNP's 2007 public outreach calendar. Additional information regarding the evacuation routes was obtained from the past ETE report for the FNP site and the county radiological emergency response plans. The maps and descriptions in both documents were used by IEM as the basis of network verification activity. IEM personnel also met with the FNP emergency response planning staff regarding additional information and clarifications.

The public outreach calendar included a detailed description of the evacuation routes for both the Alabama and Georgia sides within a 10-mile radius. It provided descriptive information on recommended protective actions and the names and locations of reception centers for each zone. The map in the calendar clearly marked the evacuation routes and the direction of evacuation towards the respective reception centers. The reception centers are located well beyond the 10-mile EPZ.

IEM personnel drove along the designated evacuation routes in the direction of an evacuation, and all the way to the reception centers to collect complete and accurate information about the physical state of the roads. Any differences between information indicated in the calendar, NAVTEQ data, and existing field conditions were noted and, where necessary, were incorporated into the analyses. Figure 9 shows the entire evacuation network.

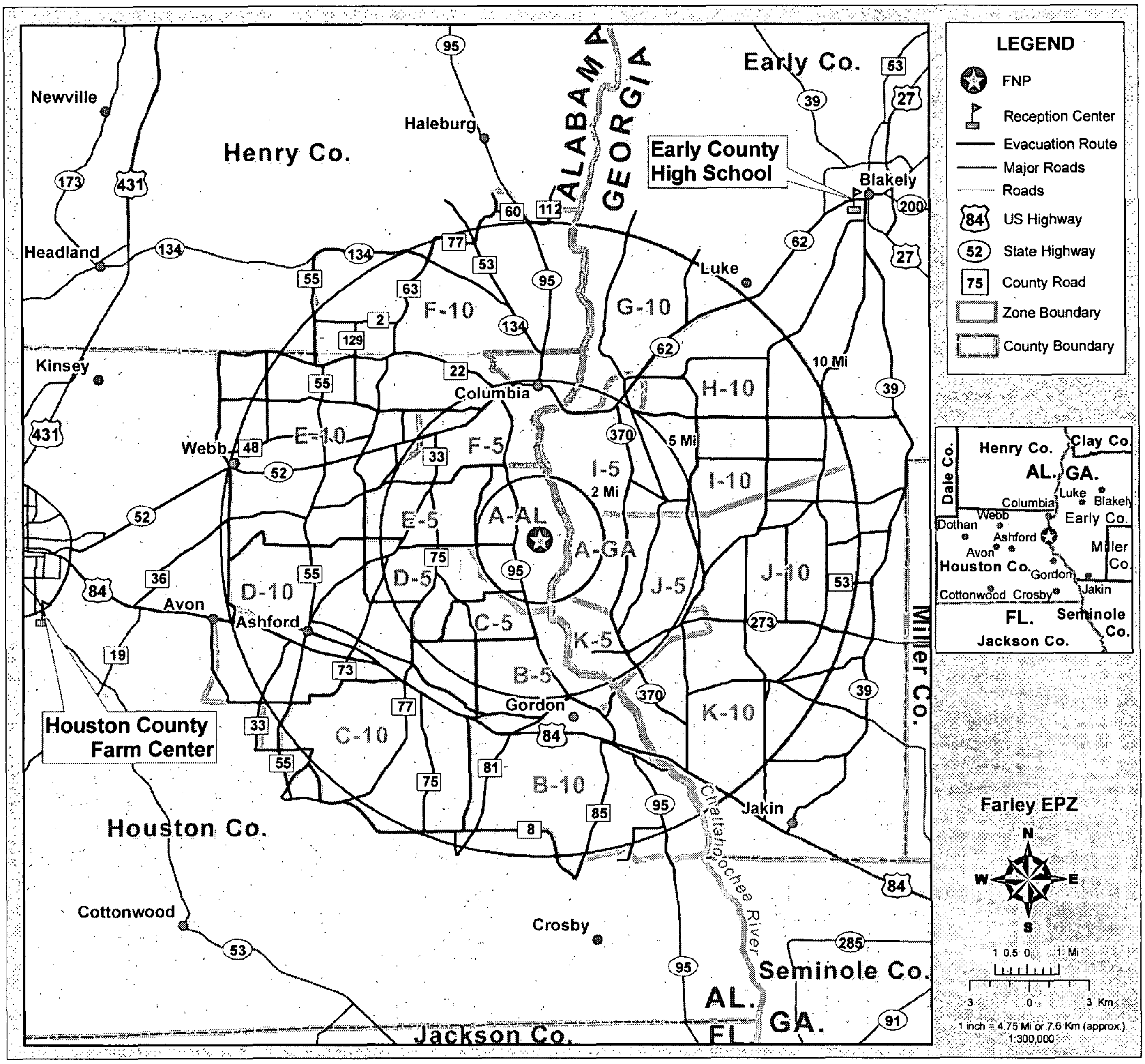


FIGURE 9: FNP EVACUATION NETWORK WITH RECEPTION CENTERS

Network Definition

IEM performed a complete review of the evacuation roadway network. The evacuation network was developed using published evacuation routes and GIS road network data representing roads available from NAVTEQ[21] and the Georgia Department of Transportation (GDOT).[22] The high accuracy NAVTEQ street network GIS data, obtained for the PTV Vision simulation software, was used for field validation purposes and to build the digital evacuation network database. The GDOT data was used to supplement the NAVTEQ data where required. To ensure the accuracy of this data, the entire evacuation network, including those roads outside the 10-mile EPZ leading to the reception centers, was verified by traveling each route in the network in the direction of evacuation and collecting detailed information regarding the properties of each road section using a Global Positioning System (GPS)-enabled device. The GPS allowed IEM personnel to locate—with a high degree of precision—any sections that had changed in channelization, curvature, speed limits, or other necessary network information.

The specific network attributes that were collected during the field trip included number of lanes, speed, turns, traffic controls, pavement type and width, shoulder width, and any other information required to model the traffic capacity of each link in the network.

Evacuation Route Descriptions

The evacuation network modeled for the ETE analyses covers Henry and Houston counties in Alabama, and Early County in Georgia. The evacuation routes were originally developed by the Alabama and Georgia Emergency Management Agencies and county emergency officials. The evacuation route network is composed of three kinds of roads: highways, major arterial (roads connecting to highways), and minor arterial or connector roads (residential roads connecting to major arterial roads).

An example of a highway in the EPZ is United States Highway 84 (US-84). Examples of major arterials are Alabama State Road 95 (AL-95), Alabama State Road 52 (AL-52), Georgia State Road 62 (SR-62), and Georgia State Road 370 (SR-370). An example of a connector road is Bill Yance Road in Alabama. The connector roads, although not part of the evacuation routes described in the calendar, actually load the evacuee population onto the evacuation routes. The following items are descriptions of each evacuation route as mentioned in the calendar (see also Figure 10 and Figure 11).

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21 PTV America, Inc. "NAVTEQ Data for PTV VISION." Online: http://www.ptvamerica.com/navteq_tiles/index.html (last accessed December 13, 2007).

22 Georgia Department of Transportation. Online: http://www.dot.state.ga.us. GDOT road network data was downloaded from the Georgia GIS Clearinghouse Web site: https://gis1.state.ga.us/index.asp. No such information was readily available on the Alabama Department of Transportation (ALDOT) website.

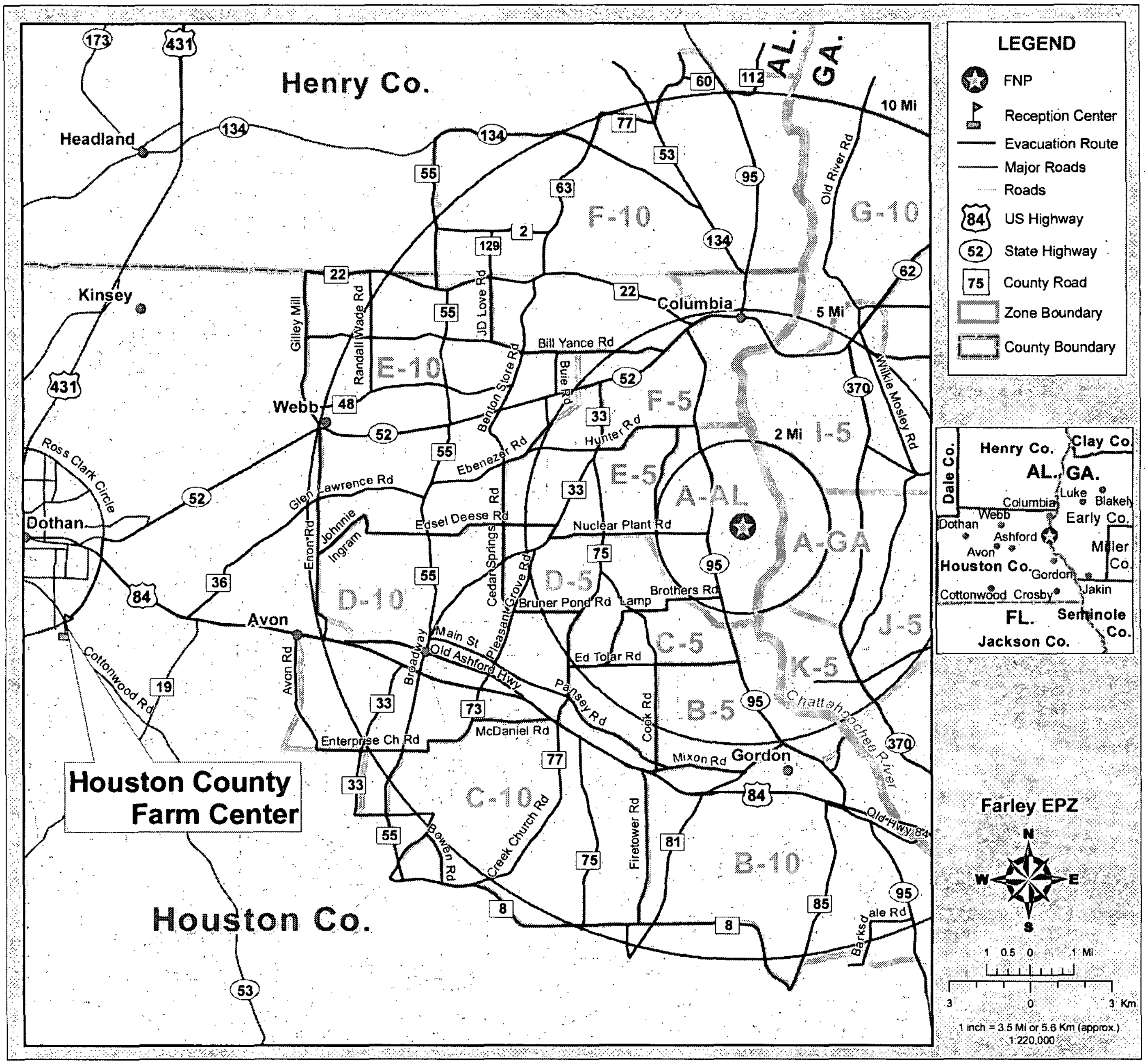

FIGURE 10: FNP ALABAMA EVACUATION ROUTES

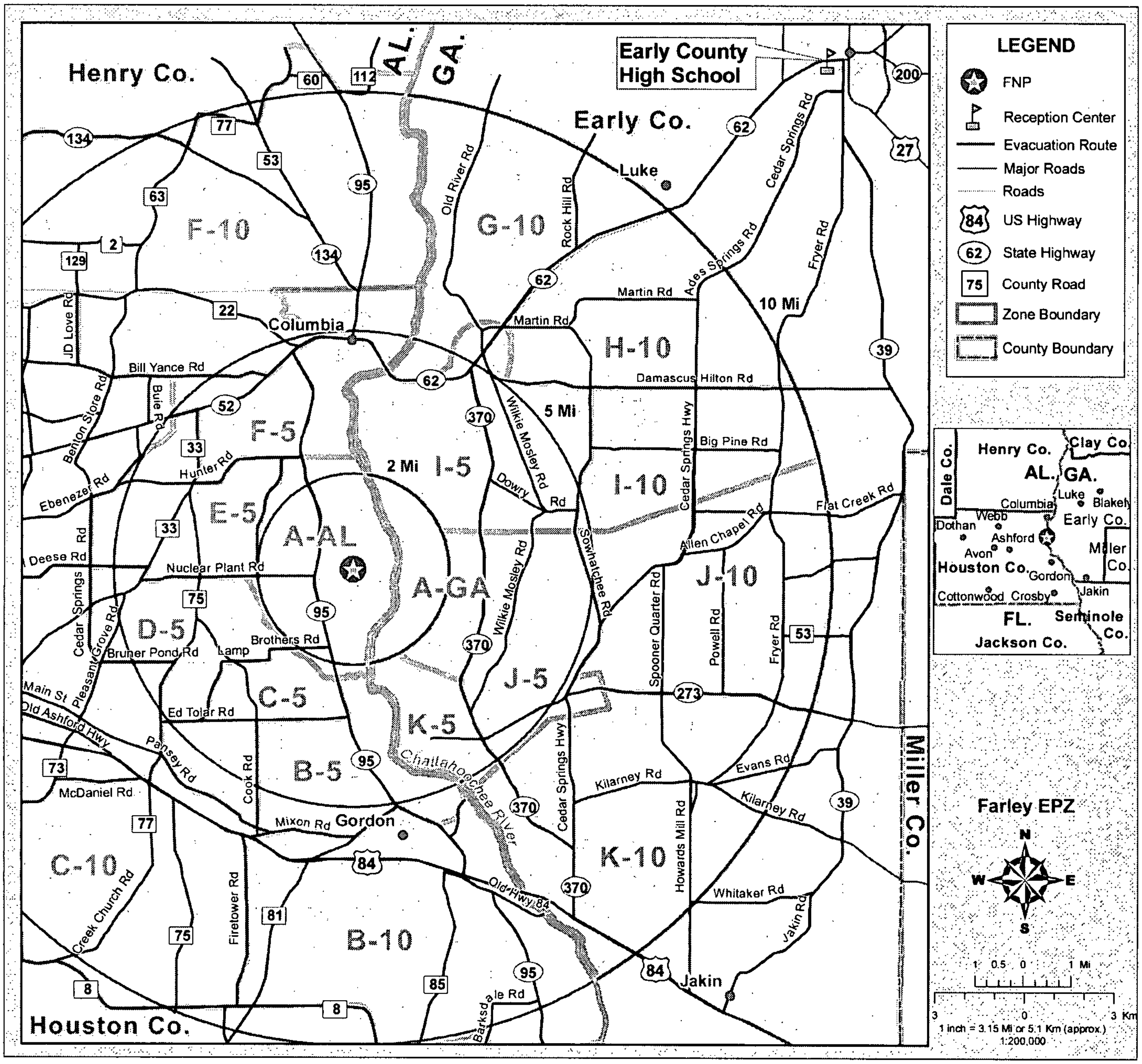

FIGURE 11: FNP GEORGIA EVACUATION ROUTES

Reception Center/Shelter for Alabama Residents:

- Houston County Farm Center: Go west on US-84 or AL-52 to Ross Clark Circle in Dothan. Then go south on Ross Clark Circle to Houston County Farm Center located at the intersection of Ross Clark Circle and Cottonwood Road (AL-53).

Reception Center/Shelter for Georgia Residents:

- Early County High School gymnasium in Blakely, GA: Go east to SR-39. Then go north to Blakely or take SR-62 into Blakely.

Each evacuation route leads to one of two designated reception centers. Table 11 lists the designated reception centers and their physical addresses. Figure 9 shows the reception centers graphically.

TABLE 11: RECEPTION CENTERS

Reception Center	Address
Houston County Farm Center	1701 E Cottonwood Road Dothan, AL 36301
Early County High School	12020 Columbia Street Blakely, GA 39823

<u>Evacuation Network Characteristics</u>

The evacuation network, as modeled using the NAVTEQ street network data, contains 1,077 links in the direction of evacuation and includes the connector roads.23 The total length of the network, again in the direction of evacuation and all the way to the reception centers, is about 454 miles. Detailed information regarding the roads that make up the evacuation network is provided in Appendix B.

The highways generally have a posted speed limit of 50–65 mph. The major and minor arterial or connector roads generally have a posted speed limit of 35-45 mph. On some of the roads, especially the highways, the posted speed limit decreases to 25 mph near city limit boundaries. Unpaved roads or dirt roads do not have posted speed limits, so a speed limit of 20-25 mph was assumed for modeling purposes based on comfortable and safe driving speeds achieved by IEM personnel on these roads during field verification. Most of the links in the evacuation network (including some highways) generally have one lane available in the direction of evacuation. There are no interstates within the 10-mile EPZ. Two roads in the EPZ have network links with two lanes in the direction of evacuation— US-84 west towards Ross Clark Circle in Dothan, Alabama, and US-84 east toward Jakin, Georgia. AL-52 and GA SR-62 also have two lanes in the direction of evacuation along some sections (due to the presence of passing lanes). US-84 has three lanes available in the direction of evacuation as it approaches Ross Clark Circle in Dothan..

23 A link is defined as a road section where its characteristics (e.g., speed limit, number of lanes) are constant. An intersection starts a new link or ends a link.

Traffic control along the evacuation routes is mostly managed using stop signs. In Alabama, traffic lights were found along AL-95 (approaching center of Columbia), along AL-52 (approaching Dothan), along Ross Clark Circle (in Dothan), at the intersection of Broadway and Old US-84 (in Ashford), and along US-84 (approaching Dothan). In Georgia, a traffic light was found at the intersection of Church Street and Columbia Road in Blakely.

Evacuation Time Estimate Methodology

ETEs are developed using VISUM, one of the core components of the PTV Vision software suite. VISUM is used to estimate evacuation times for different scenarios (e.g., day vs. night or normal vs. adverse weather) for user-defined spatial networks. Information provided by PTV Vision includes evacuation or clearance times, operational characteristics (e.g., average evacuation speed, average distance traveled), points of congestion, and other data necessary to evaluate evacuation plans.

The evacuation network was defined based on the information provided in 2007 public outreach calendar. IEM Subject Matter Experts drove the designated routes to ensure complete and accurate information about the state of the roads and to evaluate the appropriate selection of routes given the current conditions onsite.

Population (number of cars) loaded onto the network is based on the data and methods described above in the Section 0. Loading times for the evacuation network are described below. Additional details about the methodology are included in the following sections.

Assumptions

Key assumptions that have a substantial impact on the results of the analysis are detailed in the following sections. Any assumptions associated with the development of population estimates are included in Section 0.

Loading of the Evacuation Network

The timing of network loading[24] is derived from data presented in Evaluating Protective Actions for Chemical Agent Emergencies.[25] This data was collected during evacuations executed in response to large-scale chemical spills and explicitly incorporates the time required for communication of the warning (warning diffusion) and the time required for an individual to respond to the warning (mobilization). The data collected in this meta-study was based on transient, permanent, and special populations and is therefore appropriate to use as "general" warning diffusion and public mobilization curves for all three population types.

The underlying assumption regarding the applicability of Rogers' mobilization curves in the ETE study is that public perception of radiological emergencies differs from the actual characteristic of such an event. The familiarity of the hazard and the social assessment of the risks associated with the hazards are among the underlying forces that guide the decision-making process in an evacuation scenario. People are more likely to respond to calls for evacuation when the assessment of threat in the community is high and dangers to life and property are recognized. The reality may be different. The alarm associated with social response in a radiological emergency makes the use of Rogers' mobilization curves prudent for the ETE study.

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24 Loading is defined as the appearance of evacuating vehicles on the roads.

25 Rogers, G. O., et al., *Evaluating Protective Actions for Chemical Agent Emergencies* (ORNL-6615), Oak Ridge, TN: Oak Ridge National Laboratory, 1990.

It should also be noted that these curves were developed from the empirical data collected from real-life evacuations in response to actual events. No similar study developed specifically for radiological events is readily available. Therefore, the widely accepted Rogers' mobilization curves were used for this study. The implications of assuming public behavior in absence of real data are unknown. Actual data taken from a somewhat similar real-life scenario and similar public response is more applicable than some manufactured assumptions about how people will behave.

The specific timing used for warning diffusion is detailed in Figure 12. Since the distribution of times depends on the warning system employed, the alert and notification systems (ANS) around the site were evaluated based on the description in the emergency plans. The warning diffusion time distribution was chosen based on the availability of sirens, tone alert radios (TARs), and the emergency alert system (EAS) in the EPZ. It was also assumed that in boating and recreational areas, local emergency officials will sound sirens and/or use loud speakers to warn visitors. Any deviations from this assumption will impact the evacuation times. For example, any loss of the capability of the ANS components will potentially increase the evacuation times. For example, Figure 12 shows that if only EAS is used, the evacuation times will be longer since it takes comparatively more time for warning to diffuse.

The mobilization curve (Figure 13) is combined with the warning diffusion curve to form a composite loading curve that reflects the actual time distribution of cars loaded on the network. It is important to note that the starting point for this curve is the time at which public notification begins—not the start time of a hypothetical event.

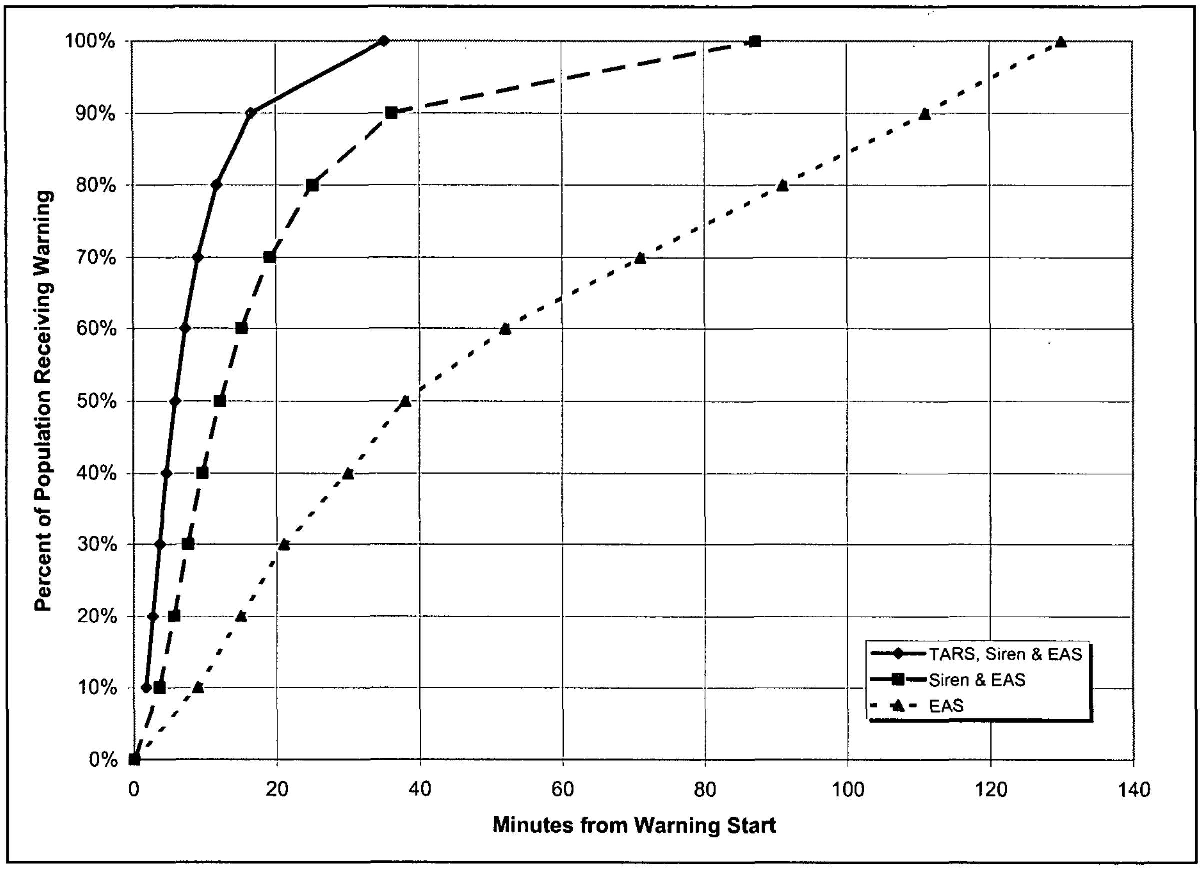

FIGURE 12: WARNING DIFFUSION FOR SELECTED NOTIFICATION SYSTEMS[26]

26 *Ibid.*

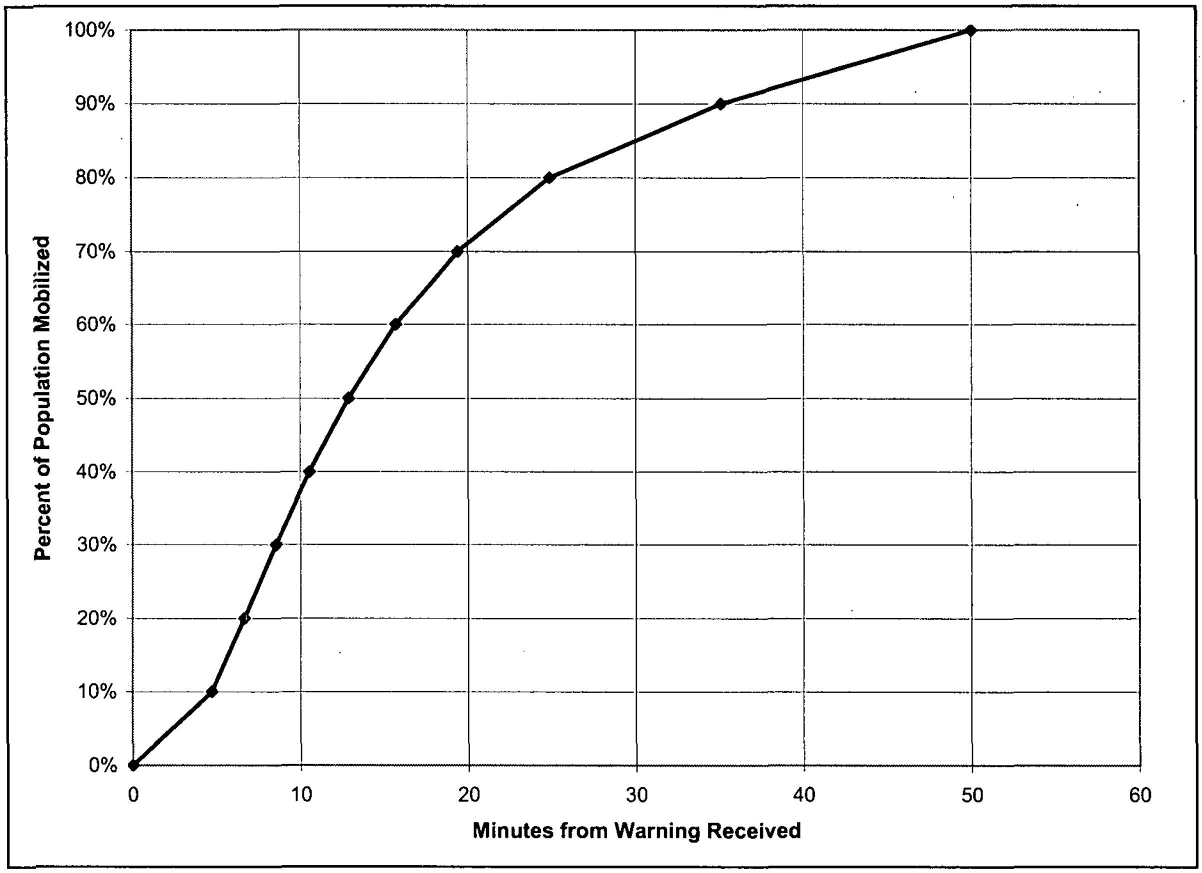

FIGURE 13: POPULATION MOBILIZATION TIMES27

27 *Ibid.*

Evacuation Simulation

Evacuations were simulated using the population and vehicle demand data, evacuation network data, and loading distribution data discussed in the previous sections. VISUM was used to simulate evacuations. Figure 14 describes the framework of the analysis and three of its main features: the demand model, the network model, and the impact model.

FIGURE 14: ETES ANALYSIS FRAMEWORK USING VISUM

The Demand Model

The demand model contains the travel demand data. The total number of vehicles originating from a zone is calculated by dividing a population with its expected vehicle occupancy rate. The total number of vehicles originating from a zone is then distributed to different time intervals based on the loading distribution curve for the zone. The loading distribution curve for the zone depends on the warning system available for that zone. The travel demand is described by an origin-destination (OD) matrix. The OD matrix refers to a time interval and the total number of vehicles departing in that time interval.

The Network Model

The network model describes the relevant supply data of an evacuation network. The supply data consists of traffic zones, nodes, links, speed limits, and capacities. Traffic zones describe areas with particular boundaries based on demography, topography, land characteristics, access routes, and local jurisdictions. They represent the origin and destination of trips within the evacuation network. Nodes define positions of intersections in the evacuation network. Links connect nodes and, therefore, describe the road infrastructure. Every network object is described by its attributes (e.g., speed limits and capacities for the links). The travel time of a vehicle on a given link depends on the speed permitted on and the capacity of—the traffic volume that a road can handle before the formation of a jam—the link. The capacity calculations in the analysis are based on the Transportation Research Board's Highway Capacity Manual.28

The Impact Model

The impact model takes its input data from the demand model and the network model. PTV Vision provides different impact models to analyze and evaluate the evacuation network. A user model simulates the behavior of travelers. It calculates traffic volumes and service indicators, such as travel time. VISUM traffic assignment procedure chosen for this analysis simulates movement of vehicles on the network as time passes in the evacuation, and outputs volumes for each link at each time after analyzing the queuing behavior. This time-dynamic functionality allows for loading of the network via distributions, as when using a range of mobilization times.

The ETE is measured by noting when the last car passes the boundary of the EPZ. VISUM displays the calculated results in graphic and tabular forms and allows graphical analysis of results. In this way, for example, routes per OD pair, traffic flow, and isochrones can be displayed and analyzed.

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28 Transportation Research Board, National Research Council. *Highway Capacity Manual.* Washington, D.C. 2000.

Analysis of Evacuation Times

Evacuation times were estimated in order to give emergency planners in the area an approximate time required for evacuation of various parts of the footprint. The estimates were derived by using population (demand) data to determine the number of vehicles and then modeling the travel of the vehicles along the evacuation routes from their origin to their assigned reception center.

The evacuation time estimates are composed of two components. The first is loading time, which is the time required for residents within the area to prepare and then begin their evacuation. The second is travel time, which is the time between the residents' departure and when they cross the EPZ boundary. Loading time depends, in part, on how long it takes residents to receive the warning, and is thus dependent on the warning systems in their area.

As a part of the analysis, zones in the study area were grouped into scenarios to represent the different areas that might need to be evacuated during an incident. So that planners could more effectively order evacuations, scenarios were based on zones and potential wind direction. These scenarios are discussed in more detail in Section 0.

Each zone had been assigned a set of evacuation routes by State and local EMA planners, and these route restrictions were reflected in the modeling of the scenarios. These guidelines generally route evacuees based on the county where these are located at the time of the incident.

The evacuation routes are described in more detail in Section 0.

Summary of ETE Results

The evacuation time estimate results are displayed in Table 12. Evacuation times listed include warning diffusion, public mobilization, and travel time out of the EPZ. It is important to note that the evacuation time is the time from the moment at which public notification begins—not the start time of a hypothetical event.

TABLE 12 : 2010 ETES IN MINUTES [29]

Evacuation Area	Zones Impacted	Normal Weather			Adverse Weather		
		Weekday	Weeknight	Weekend	Weekday	Weeknight	Weekend
0-2 Miles	A	80	75	75	90	85	85
0-5 Miles, SW	A, B-5, C-5, D-5,	140	105	165	150	110	175
0-5 Miles, NW	A, E-5, F-5	155	155	175	165	160	185
0-5 Miles, NE	A, I-5	145	95	160	150	100	165
0-5 Miles, SE	A, J-5, K-5	130	120	135	140	135	150
0-5 Miles	A, B-5, C-5, D-5, E-5, F-5, I-5, J-5, K-5	160	155	180	170	160	190
0-10 Miles, SW	A, B-5, C-5, D-5, B-10, C-10, D-10	155	140	170	170	155	185
0-10 Miles, NW	A, E-5, F-5, E-10, F-10	155	155	175	165	160	185
0-10 Miles, NE	A, I-5, G-10, H-10, I-10	145	115	165	150	120	170
0-10 Miles, SE	A, J-5, K-5, J-10, K-10	150	130	170	165	140	185
0-10 Miles, Full EPZ	All Zones	175	155	185	195	170	200

29 Note: The scenarios are each considered individually; if combinations of the geographic evacuation areas are to be evacuated together, the larger of the two numbers should be used as the evacuation time. For example, if zones E-5, F-5, J-5, and K-5 (combination of 5-mile NW and 5-mile SE scenarios) were to be evacuated on a normal 2010 weekday, the ETE would be the greater of the two ETEs or 155 minutes.

Discussion of Scenario Results

General Trends

- The ETEs in both normal and adverse weather are driven more by the warning system and available speeds rather than the roadway capacities because vehicular demand is low compared to available roadway capacities.
- Adverse weather conditions increase ETEs by approximately 5 to 20 minutes, due primarily to reduced travelling speeds, and to a lesser degree, to reduced roadway capacities.
- For each evacuation area except for the two-mile radius, the weekend scenario produced the highest evacuation times. This is due to the increased amount of recreational transients in the area (hunters and boaters and park visitors) on the weekend. This population has a higher warning and diffusion time than other populations—up to 3 hours 5 minutes, compared to 2 hours 30 minutes for EAS and sirens, and 2 hours 5 minutes for EAS and TARs.

Evacuation Area 1: 0–2 Miles

The majority of the population within the two-mile radius, Zone A, consists of Plant Farley employees. This population will evacuate to the Houston/Henry County Evacuation Center in Alabama, primarily using Pleasant Grove Road to US-84.There is also a small amount of permanent population, transient employees, and recreational hunters in the area. These populations will primarily use SR 370 to SR 62 to exit the EPZ for the Early County reception center in Georgia, and US-84 to exit the EPZ to Houston and Henry counties in Alabama. The evacuation times range from 1 hour 15 minutes to 1 hour 30 minutes. The highest evacuation times are for the Weekday Scenario, when the Plant population is at its peak. No significant congestion occurs in this scenario.

Evacuation Area 2: 0–5 Miles SW

This evacuation area includes all population in the two-mile radius (Zone A), and additional population in the five-mile radius in Houston County west of the Chattahoochee River and south of Nuclear Plant Road/Edsel Deese Road (Zones B-5, C-5 and D-5). This population includes permanent residents, transient employees, Plant Farley employees, recreational visitors to the Chattahoochee River, and hunters. There are no special facilities in this evacuation area. The population evacuating this area will primarily use US-84 to leave the 10-mile EPZ. The small population that will evacuate to the Early County reception center will primarily use State Route 370 to State Route 62 to exit the EPZ. The evacuation times range from 1 hour 45 minutes to 2 hours 15 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 3: 0–5 Miles NW

This evacuation area includes all population in the two-mile radius (Zone A), and additional population in Houston County in the five-mile radius west of the Chattahoochee River and north of Nuclear Plant Road/Edsel Deese Road (Zones E-5 and F-5). This population includes permanent residents, transient employees, Plant Farley employees, recreational park visitors, and hunters. This area also includes two special facilities: a day care center and Houston County High School. The population evacuating this area will primarily use Alabama Highway 52 and US-84 to leave the 10-mile EPZ. The small population that will evacuate to the Early County reception center will primarily use State Route 370 to State Route 62 to exit the EPZ. The evacuation times range from 2 hour 35 minutes to 3 hours 5 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 4: 0–5 Miles NE

This evacuation area includes all population in the two-mile radius (Zone A), and additional population in Early County east of the Chattahoochee River in Zone I-5. The population includes permanent residents, transient employees, Plant Farley employees, recreational visitors to the Chattahoochee River, hunters, and special facility workers. The population evacuating to the Houston/Henry County reception center will primarily use Pleasant Grove Road to US-84 to exit the EPZ. The population evacuating to the Early County reception center will primarily use State Route 62 to exit the EPZ. The evacuation times range from 1 hour 35 minutes to 2 hours 5 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 5: 0–5 Miles SE

This evacuation area includes all population in the two-mile radius (Zone A), and additional population in Early County east of the Chattahoochee River in Zones J-5 and K-5. The population includes permanent residents, transient employees, Plant Farley employees, hunters, and special facility workers. The population evacuating to the Houston/Henry County reception center will primarily use Pleasant Grove Road to US-84 to exit the EPZ. The population evacuating to the Early County reception center will primarily use State Route 273, State Route 370, Cedar Springs Highway, and State Route 62 to exit the EPZ. The evacuation times range from 2 hours 0 minutes to 2 hours 30 minutes and are highest for the Weekend Scenario. These times are driven by the warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 6: 0–5 Miles

This area includes the entire five-mile EPZ, consisting of zones A, B-5, C-5, D-5, E-5, F-5, I-5, J-5 and K-5.The evacuation times for the entire 5-mile EPZ are similar to the maximum evacuation times by sector for each scenario. The evacuation routes for the entire 5-mile radius were similar to those for each sector. The evacuation times ranged from 2 hours 35 minutes to 3 hours 10 minutes. For each scenario (Weekday, Weeknight, and Weekend), the evacuation times for the overall five-mile EPZ were 0-5 minutes higher than the highest time for each sector. This indicates that there will not be excess congestion from adjacent sectors evacuating together.

Evacuation Area 7: 0–10 Miles SW

This evacuation area includes all population in the five-mile SW radius (Zones A, B-5, C-5 and D-5), and additional population in the 10-mile radius in Houston County west of the Chattahoochee River and south of Nuclear Plant Road/Edsel Deese Road (Zones B-10, C-10 and D-10). This population includes permanent residents, transient employees, Plant Farley employees, recreational visitors to the Chattahoochee River, and hunters. The area includes a day care, Ashford Elementary School, Ashford High School, Houston County, Career and Technical Center, Ashford Academy, and several other special facilities. The population evacuating this area will primarily use Alabama Highway 52 and US-84 to leave the 10 mile EPZ. The small population that will evacuate to the Early County reception center will primarily use State Route 370 to State Route 62 to exit the EPZ. The evacuation times range from 2 hours 20 minutes to 3 hours 5 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 8: 0–10 Miles NW

This evacuation area includes all population in the five-mile NW radius (Zones A, E-5 and F-5), and additional population in Houston and Henry counties in the 10-mile radius west of the Chattahoochee River and north of Nuclear Plant Road/Edsel Deese Road (Zones E-10 and F-10). This population includes permanent residents, transient employees, Plant Farley employees, recreational park visitors, and hunters. This area also includes three special facilities: a day care center, Houston County High School, and Webb Elementary School. The population evacuating this area will primarily use Alabama Highway 52 and US-84 to leave the 10-mile EPZ. The small population that will evacuate to the Early County reception center will primarily use State Route 370 to State Route 62 to exit the EPZ. The evacuation times range from 2 hours 35 minutes to 3 hours 5 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 9: 0–10 Miles NE

This evacuation area includes all population in the five-mile NE radius (Zones A and I-5), and additional population in Early County east of the Chattahoochee River in Zones G-10, H-10 and I-10. The population includes permanent residents, transient employees, Plant Farley employees, recreational visitors to the Chattahoochee River, recreational park visitors, hunters, special facility workers, and Camp E-Tu-Nake school. The population evacuating to the Houston/Henry County reception center will primarily use US-84 to exit the EPZ. The population evacuating to the Early County reception center will primarily use State Route 62 to exit the EPZ. The evacuation times range from 1 hour 55 minutes to 2 hours 50 minutes and are highest for the Weekend Scenario. These times are driven by warning and diffusion times and are not influenced by significant congestion.

Evacuation Area 10: 0–10 Miles SE

This evacuation area includes all population in the five-mile SE radius (Zones A, J-5 and K-5), and additional population in Early County east of the Chattahoochee River in Zones J-10 and K-10. The population includes permanent residents, transient employees, Plant Farley employees, recreational visitors to the Chattahoochee River, recreational park visitors, hunters, and special facility workers. The population evacuating to the Houston/Henry County reception center will primarily use US-84 to exit the EPZ. The population evacuating to the Early County reception center will primarily use Cedar Springs Highway, State Route 39, Ades Springs Road and State Route 62 to exit the EPZ.

Evacuation Area 11: 0–10 Miles

The evacuation time of the entire 10-mile EPZ was similar to the evacuations of the separate 10-mile 90° areas. For all scenarios, the 10-mile radius evacuation times were 0-20 minutes longer than the highest individual sector times. These times show that as traffic from each 90° area merges, congestion in the network will not significantly contribute to increased evacuation time. Some routes such as Ross Clark Circle, US-84 and Alabama Highway 52 (leading to Houston/Henry County reception center), and State Route 62 leading to Early County reception center may experience some congestion as the volumes reach levels that are near the capacity of the road.

Supplemental Analysis

The analyses related to confirmation of evacuation and potential mitigating measures to effectively manage the traffic flow were performed and are provided in the following sections.

Confirmation of Evacuation

Confirmation of the evacuation process determines whether the evacuation has been completed. The time required for confirmation of evacuation is dependent upon the method employed. The most time-consuming method typically employed is to use ground vehicles. The time required involves the driving time for each route selected.

Informing people to leave some standard signs on their doors or windows, such as tying a white cloth to the front doorknob of the house or to the mailbox (as mentioned in the public outreach calendar), when they leave their houses would help the authorities in the confirmation of evacuation. Presence of TCPs and Access Control Points (ACPs) at strategic locations within the evacuation network could provide real-time feedback regarding the progress of the evacuation process. All evacuees are recommended to register at the designated county reception centers as they arrive. This procedure helps the authorities to account for the population within the designated county. This can be accounted as one of the means of confirmation of evacuation only under the assumption that all the evacuees would actually report to the reception centers and nowhere else. Telephoning people at their homes could also be considered as a possible means of ensuring completion of evacuation.

As noted in the county radiological emergency response plans, evacuation confirmation will be accomplished by the county Sheriff's Department and supporting law enforcement agency personnel, who will traverse roadways throughout the affected area to ensure that the residential population has evacuated their homes. Personnel from the State Department of Natural Resources Law Enforcement Section and the county Emergency Management Agency will ensure that hunters and fishermen within the 10-mile EPZ are evacuated. Additional assistance is available from other State agencies. Officials from the plant will advise the county EOCs when evacuation is confirmed at the plant site.

The actual time associated with the confirmation process would depend on both the number of personnel and the amount of equipment available. These resources may change significantly under various emergency conditions.

Evacuation Traffic Management Locations and Other Potential Mitigating Measures

In order to efficiently promote smooth movement of traffic flow during an evacuation, several TCPs have been identified by the plant and county emergency response planning personnel. These TCPs are listed in Table 13 and shown graphically in Figure 15. The responsibility of supervising traffic controls during an evacuation will be shared between State and county emergency management and law enforcement personnel, as available. Each TCP will be manned and/or road blocks will be established to direct evacuees out of the EPZ and to deny access into the affected area. Also, route markers will be placed along the evacuation routes at critical intersections and road block locations to promote more efficient traffic flow out from the EPZ.

TABLE 13: TRAFFIC CONTROL POINTS FOR THE FNP EPZ

Location ID	Description	Operation Control	State
1	3840 E. Cook Road and 1 Lamp Brothers Road	Houston County Sheriff	Alabama
2	4185 Hunter Road and 10031 N. State Hwy 95	Houston County Sheriff	Alabama
3	3928 Ed Tolar Road and 4415 N. State Hwy 95	Houston County Sheriff	Alabama
4	2475 Nuclear Plant Road and 1 Macedonia Road	Houston County Sheriff	Alabama
5	North Main Street (AL-95) and State Hwy 134 (Henry County 53)	Houston County Sheriff	Alabama
6	12412 N. State Hwy 95 and 16742 E. State Hwy 52	Houston County Sheriff	Alabama
7	517 Pea Market Road and 7841 Bill Yance Road	Houston County Sheriff	Alabama
8	13832 E. State Hwy. 52 and 315 Jesse Road	Houston County Sheriff	Alabama
9	3564 Cedar Springs Road and 1766 Ebenezer Road	Houston County Sheriff	Alabama
10	2898 Cedar Springs Road and 1 King Road	Houston County Sheriff	Alabama
11	2141 Cedar Springs Road and 3239 Edsel Deese Road	Houston County Sheriff	Alabama
12	1308 Cedar Springs Road and 2465 N. County Road 33	Houston County Sheriff	Alabama
13	1 Cedar Springs Road and 1869 Pleasant Grove Road	Houston County Sheriff	Alabama
14	2697 N. County 75 Road and 1530 Bruner Pond Road	Houston County Sheriff	Alabama
15	1372 N. County 75 Road and 1 Ed Tolar Road	Houston County Sheriff	Alabama
16	306 N. County 75 Road and 1 Liberty Road	Houston County Sheriff	Alabama
17	6190 Pansey Road and 150 E. Cook Road	Houston County Sheriff	Alabama
18	2195 N. County 81 Road and 2213 N. State Hwy 95	Houston County Sheriff	Alabama
19	Henry Co. - State Hwy 95 and County Road 112 (1st Road N. of Foster Creek)	Henry County Sheriff	Alabama

Location ID	Description	Operation Control	State
20	Henry Co. - County Road 77 and County Road 53	Henry County Sheriff	Alabama
21	Henry Co. - County Road 63 and County Road 77 (County Road 6)	Henry County Sheriff	Alabama
22	7188 E. County Road 22 and 7160 N. County Road 55	Houston County Sheriff	Alabama
23	1245 Randall Wade Road and 2241 Bill Yance Road	Houston County Sheriff	Alabama
24	4260 Enon Road and 7695 E. State Hwy 52	Houston County Sheriff	Alabama
25	2626 Enon Road and 4230 Glen Lawrence Road	Houston County Sheriff	Alabama
26	1366 Enon Road	Houston County Sheriff	Alabama
27	1 Broadway Avenue (County Road 55) and 7076 E. State Hwy 52	Houston County Sheriff	Alabama
28	489 Battles Road and 1230 Broadway Avenue	Houston County Sheriff	Alabama
29	1890 Silcox Road and 1 Enterprise Church Road	Houston County Sheriff	Alabama
30	2208 S. County Road 33 and 1026 Enterprise Church Road	Houston County Sheriff	Alabama
31	6220 Lucy Grade Road (County Road 24) and 3935 S. County 55 Road	Houston County Sheriff	Alabama
32	1110 Antioch Church Road and 1221 Coot Adams Road	Houston County Sheriff	Alabama
33	795 Bobby Hill Road (Creek Church Road) and 5096 S. Rocky Creek Road	Houston County Sheriff	Alabama
34	4894 E. County Road 8 and 4565 S. County Road 75	Houston County Sheriff	Alabama
35	6526 E. County Road 8 and 3271 S. County Road 81	Houston County Sheriff	Alabama
36	8222 E. County Road 8 and 3435 S. Springhill Church Road	Houston County Sheriff	Alabama
37	10616 E. County Road 8 and 4593 S. County Road 85	Houston County Sheriff	Alabama
38	3090 S. State Hwy 95	Houston County Sheriff	Alabama
39	2468 Barksdale Road	Houston County Sheriff	Alabama
40	1 N. County Road 33 and 899 N. Broadway Street	Houston County Sheriff	Alabama

Location ID	Description	Operation Control	State
41	399 Main Street and 799 N. Broadway Street	Houston County Sheriff	Alabama
42	399 Church Street and 499 N. Broadway Street	Houston County Sheriff	Alabama
43	1994 Old Hwy 84 and 299 N. Broadway Street	Houston County Sheriff	Alabama
44	1 Wallace Buie Road and 635 Webb to Kinsey Road	Houston County Sheriff	Alabama
45	Highway 62 at Chattahoochee River (Early/Houston County Line)	Early County Sheriff	Georgia
46	Highway 62 at Highway 370	Early County Sheriff	Georgia
47	Highway 62 at County Road 25 (Martin Rd)	Early County Sheriff	Georgia
48	Highway 62 at County Road 145 (Rock Hill Rd)	Early County Sheriff	Georgia
49	Highway 62 (Columbia Rd) at Reception Center (Early County High School)	Early County Sheriff	Georgia
50	Highway 363 (Cedar Springs Rd) at Chattahoochee Street	Early County Sheriff	Georgia
51	Highway 363 (Cedar Springs Hwy) at County Road 25 (Martin Rd)	Early County Sheriff	Georgia
52	Highway 363 (Cedar Springs Hwy) at County Road 279 (Damascus Hilton Rd)	Early County Sheriff	Georgia
53	Highway 363 (Cedar Springs Hwy) at County Road 284 (Allen Chapel Rd)	Early County Sheriff	Georgia
54	Highway 370 at County Road 103 (Dowry Rd)	Early County Sheriff	Georgia
55	Highway 370 at Highway 273	Early County Sheriff	Georgia
56	County Road 50 (Spooner Quarter Rd) at County Road 48 (Kilarney Rd)	Early County Sheriff	Georgia
57	US Highway 84 at Chattahoochee River (Early/Houston County Line)	Early County Sheriff	Georgia
58	US Highway at Howards Mill Road	Early County Sheriff	Georgia

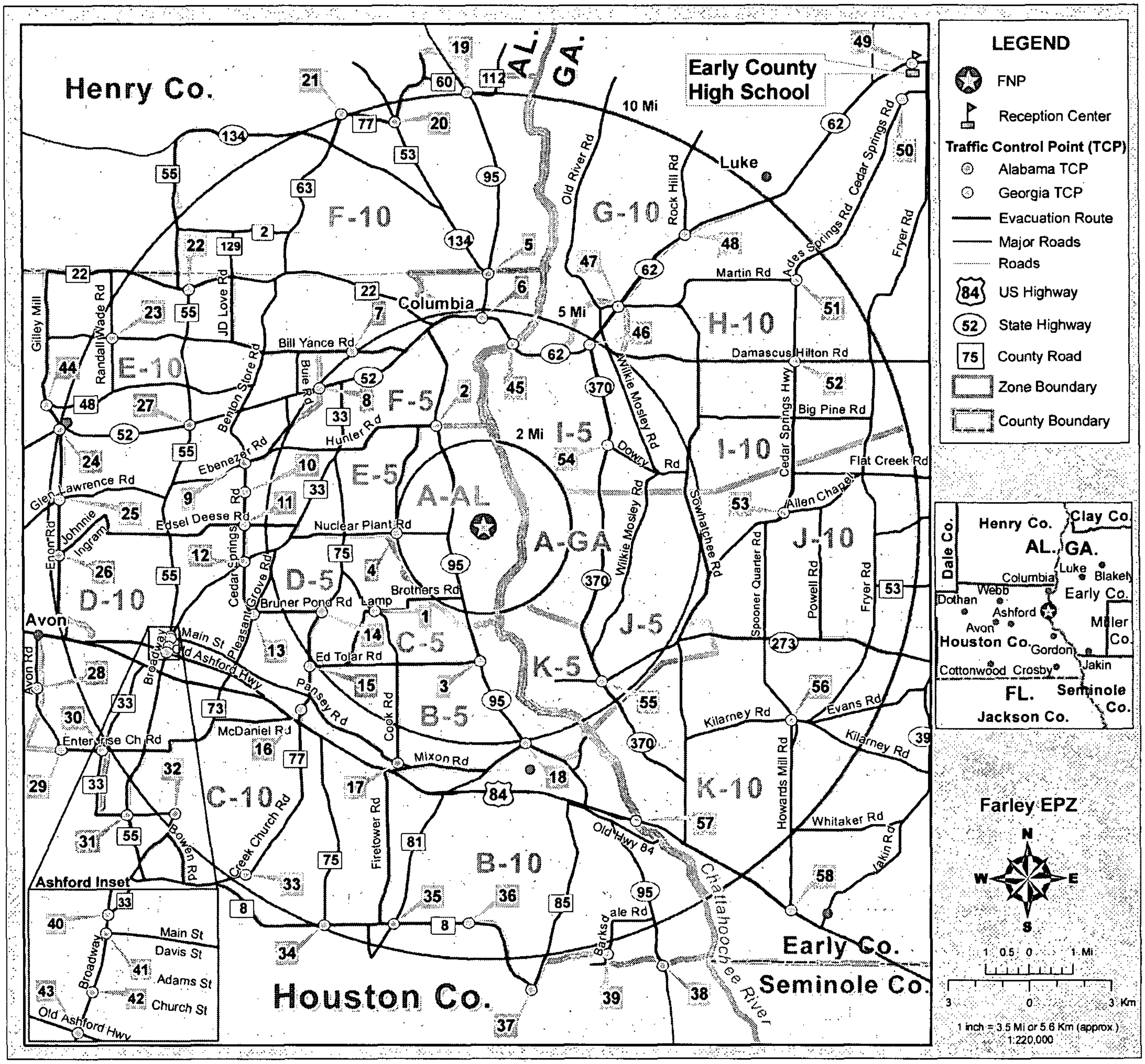

FIGURE 15: TRAFFIC CONTROL POINTS IN AND AROUND FNP EPZ

Conclusion and Recommendations

The ETEs developed for 11 evacuation areas within the 10-mile FNP EPZ measured the time from the public notification to when the last evacuating vehicle exited the EPZ boundary.

ETEs for the evacuation areas ranged from 75 minutes to 185 minutes for the normal scenarios, and from 85 minutes to 200 minutes for those occurring in adverse weather. Variations in ETEs between scenarios generally correlated to differences in the number of evacuating vehicles, the capacity of the evacuation routes, the roadway conditions, or the distance from the origin zones to the EPZ boundary. The weekend scenario produced the highest evacuation times due to the longer mobilization time for the higher number of recreational transients in the area (hunters and boaters) on the weekend.

The analysis shows that the capacity of the roadway network within the EPZ is adequate to accommodate the population for all scenarios. Based on the data gathered and the results of the evacuation study conducted, IEM believes that the existing evacuation strategy is functional for the year 2010 conditions, given the lack of severe congestion or very high ETEs.

Appendix A: Geographical Boundaries of Evacuation Zones

Evacuation Zones	Zone Boundaries	Landmark Descriptions
A-AL	North: Hunter Road, then line due east to Chattahoochee River West: Macedonia Road and Jackson Creek South: Cedar Creek East: Chattahoochee River	Includes Farley Nuclear Plant
A-GA	North, South, East – 2 mile boundary West – Chattahoochee River	
B-5	North: Cedar Creek and Ed Tolar Road West: Cook Road South: Pansey Road, then Mixon Road, then County Road 81, then Main Street in Gordon, then Boat Landing Road East: Chattahoochee River	Gordon Boat Ramp
B-10	North: Pansey Road, then Mixon Road, then County Road 81, then Main Street in Gordon, then Boat Landing Road West: Fire Tower Road South: County Road 8, then County Road 85, then Greenhouse Road, then creek turning east to Chattahoochee River East: Chattahoochee River	Includes town of Gordon
C-5	North: Lamp Brothers Road, Jackson Creek, and Cedar Creek West: County Road 75 South: Pansey Road and Ed Tolar Road East: Cook Road and Alabama Highway 95	
C-10	North: Pansey Road, then County Road 75, then U.S. Highway 84, then McDaniel Road, then Cosby Road, then Meadows Road, then Garrett Road, then Buster Road West: County Road 55 South: Coot Adams Road, then Bowen Road, then County Road 8 East: Fire Tower Road, to U.S. Highway 84, to Mixon Road	

Evacuation Zones	Zone Boundaries	Landmark Descriptions
D-5	North: Nuclear Plant Road, then County Road 33, then Edsel Deese Road West: Cedar Springs Road South: Pleasant Grove Road, then Bruner Pond Road, then County Road 75, then Ed Tolar Road, then Paul Lamp Road and Lamp Brothers Road East: Jackson Creek	
D-10	North: Edsel Deese Road, then Ben Ivey Road, then Johnniee Ingram Road West: Enon Road, then Bluffspring Road, then Bluff Springs Road, then U.S. Highway 84, then Broadway Avenue, becoming Avon Road South: Aspen Road becoming Enterprise Church Road, then County Road 33, then Lucy Grade Road, then County Road 55, then Buster Road, to Garrett Road, to Meadows Road, to Cosby Road, to McDaniel Road, to U.S. Highway 84 East: County Road 75, to Bruner Pond Road, to Cedar Springs Road	Includes town of Ashford, Ingram Lake, and Enterprise Church
E-5	North: Hunter Road, then County Road 33, then Alabama Highway 52, then Jesse Road, then Ebenezer Road West: Cedar Springs Road South: Edsel Deese Road, to County Road 33, to Nuclear Plant Road East: Macedonia Road	Hunters Cemetery
E-10	North: Bill Yance Road, to J D Love Road, to County Road 22 West: Gilley Mill Road, to Webb Kinsey Road, to Enon Road South: Ingram Road, to Ben Ivey Road, to Edsel Deese Road East: Cedar Springs Road, to Ebenezer Road, to Jesse Road	Qualico Steel, Webb Elementary School

Evacuation Zones	Zone Boundaries		Landmark Descriptions
F-5	North:	Northern boundary of Columbia, to Omussee Creek, to Alabama Highway 52, to Bill Yance Road	Includes town of Columbia, Omussee Creek State Park
	West:	Jesse Road, to Alabama Highway 52, to County Road 33	
	South:	Hunter Road, then line east to Chattahoochee River	
	East:	Chattahoochee River	
F-10	North:	County Road 112, Alabama Highway 95, County Roads 277 and 77, then County Road 63, then Alabama Highway 134	Spring Hill Church
	West:	County Road 56/55	
	South:	County Road 22, then J D Love Road, then Bill Yance Road, then Alabama Highway 52, then Omussee Creek, then northern boundary of Columbia	
	East:	Chattahoochee River	
G-10	North:	10 mile boundary	Includes Coheelee Creek Park and boat landing, and Camp E-TU-NAKE
	West:	Chattahoochee River	
	South and East:	Georgia Highway 62	
H-10	North and West:	Georgia Highway 62	
	South:	County Road 1691	
	East:	10 mile boundary	
I-10	North:	County Road 1691	
	West:	County Road 13	
	South:	Power line from Farley Nuclear Plant	
	East:	10 mile boundary	
J-5	North:	Power line from Farley Nuclear Plant	
	West:	2 mile boundary	
	South:	Georgia Highway 370	
	East:	5 mile boundary, Georgia Highway 363, and County Road 26	

Evacuation Zones	Zone Boundaries	Landmark Descriptions
J-10	North: Power line from Farley Nuclear Plant West: County Road 26 and Georgia Highway 363 South: Georgia Highway 273/Cedar Springs Road East: 10 mile boundary	Green Cemetery, Cedar Springs Church
K-5	North: 2 mile boundary West: Chattahoochee River South/Southeast: 5 mile boundary East/Northeast: Georgia Highway 370	Georgia Pacific
K-10	North: Cedar Springs Road/Georgia Highway 273 Northwest: 5 mile boundary Southwest: Chattahoochee River East/Southeast: 10 mile boundary	Navy Yard Landing, Republic Conduit

Appendix B: Evacuation Network Links (Detailed Information)

Road Name	State	Number of Links	Number of Lanes (max)	Length (miles)	Speed Limit (max)
AL-134	Alabama	20	1	17.03	45
AL-52	Alabama	122	2	32.05	55
AL-52/W Church St	Alabama	18	1	1.72	55
AL-53/E Cottonwood Rd	Alabama	6	1	0.43	45
AL-95	Alabama	22	1	19.54	55
AL-95/George H Grimsley Hwy	Alabama	54	1	24.69	55
AL-95/N Main St	Alabama	18	1	2.03	55
Ades Springs Rd	Georgia	14	1	5.10	55
Allen Chapel Rd	Georgia	6	1	4.20	25
Antioch Church Rd	Alabama	6	1	2.20	45
Avon Rd	Alabama	16	1	3.20	45
Balkum Rd	Alabama	2	1	0.68	45
Barksdale Rd	Alabama	4	1	3.97	45
Ben Ivey Rd	Alabama	2	1	0.88	45
Benton Store Rd	Alabama	14	1	6.48	45
Big Pine Rd	Georgia	16	1	7.97	25
Bill Yance Rd	Alabama	38	1	16.71	45
Bluff Springs Rd	Alabama	2	1	0.07	45
Bluffspring Rd	Alabama	6	1	0.50	45
Boat Landing Road Star Route	Alabama	4	1	1.85	40
Bobby Hill Rd	Alabama	2	1	1.48	45
Bowen Rd	Alabama	2	1	2.53	45
Broadway	Alabama	10	1	1.18	45
Bruner Pond Rd	Alabama	8	1	3.57	45
Buie Rd	Alabama	2	1	2.00	45
Buster Rd	Alabama	2	1	1.19	25
CR-22	Alabama	46	1	18.73	55
CR-75	Alabama	18	1	9.26	45
CR-77	Alabama	4	1	3.84	35
CR-8	Alabama	18	1	11.43	45
CR-85	Alabama	14	1	9.24	45
Cedar Springs Hwy/Rd	Georgia	52	1	25.27	45
Cedar Springs Rd	Alabama	42	1	14.79	55
Choice Adams Rd	Alabama	2	1	2.00	35

Road Name	State	Number of Links	Number of Lanes (max)	Length (miles)	Speed Limit (max)
Columbia Rd	Georgia	20	1	2.71	50
Columbia Rd/Cr-33	Alabama	10	1	2.65	45
Coot Adams Rd	Alabama	4	1	2.87	45
CR-53	Georgia	10	1	2.84	25
CR-112	Alabama	2	1	3.69	35
CR-129	Alabama	4	1	2.02	45
CR-2	Alabama	4	1	5.19	45
CR-24/Lucy Grade Rd	Alabama	4	1	1.46	45
CR-36/Glen Lawrence Rd	Alabama	10	1	2.98	35
CR-48	Alabama	2	1	0.34	35
CR-48/Wallace Buie Rd	Alabama	20	1	5.64	35
CR-53	Alabama	6	1	8.04	35
CR-55	Alabama	32	1	14.23	45
CR-6	Alabama	2	1	0.46	35
CR-60	Alabama	4	1	1.56	35
CR-63	Alabama	6	1	8.33	45
CR-73	Alabama	10	1	2.75	45
CR-77	Alabama	10	1	5.53	45
CR-81	Alabama	22	1	12.84	45
Creek Church Rd	Alabama	12	1	4.50	45
Damascus Hilton Rd	Georgia	46	1	17.82	45
Dowry Rd	Georgia	4	1	4.05	25
E Cook Rd	Alabama	22	1	10.44	45
E CR-8	Alabama	18	1	9.78	45
Ebenezer Rd	Alabama	8	1	6.37	45
Ed Tolar Rd	Alabama	16	1	7.84	45
Edsel Deese Rd	Alabama	16	1	8.91	45
Enon Rd	Alabama	26	1	8.53	45
Enterprise Church Rd	Alabama	8	1	3.98	45
Evans Rd	Georgia	2	1	5.66	25
Fellows Rd	Alabama	4	1	0.93	45
Firetower Rd	Alabama	18	1	7.27	45
Flat Creek Rd	Georgia	14	1	8.94	25
Fryer Rd	Georgia	54	1	29.63	45
GP Plant Rd	Georgia	2	1	0.63	35

Road Name	State	Number of Links	Number of Lanes (max)	Length (miles)	Speed Limit (max)
Garrett Rd	Alabama	2	1	0.50	45
Gilley Mill Rd	Alabama	10	1	5.22	45
Glen Lawrence Rd	Alabama	28	1	9.99	45
Greenhouse Rd	Alabama	2	1	0.70	15
Hudson Rd	Alabama	4	1	1.29	45
Hunter Rd	Alabama	18	1	8.22	45
J D Love Rd	Alabama	8	1	3.09	45
Jakin Rd	Georgia	12	1	6.91	45
Johnnie Ingram Rd	Alabama	4	1	2.83	45
Kilarney Rd	Georgia	24	1	11.92	45
Kitts Rd	Alabama	2	1	0.82	20
Lamp Brothers Rd	Alabama	2	1	4.45	25
Macedonia Rd	Alabama	4	1	5.24	35
Mae Howard Rd	Georgia	6	1	1.30	25
Main St	Alabama	18	1	2.50	35
Martin Rd	Georgia	20	1	9.79	35
Mayhaw Rd	Georgia	18	1	4.16	25
McDaniel Rd	Alabama	14	1	3.57	45
Meadows Rd	Alabama	4	1	1.37	45
Mills St	Alabama	2	1	0.43	35
Mixon Rd/CR-2	Alabama	4	1	4.15	45
N Broadway	Alabama	54	1	3.92	35
N CR-33	Alabama	26	1	12.55	45
N CR-55	Alabama	10	1	6.26	45
N CR-75	Alabama	34	1	12.87	45
N Pearl St	Georgia	6	1	1.12	45
Nuclear Plant Rd	Alabama	8	1	7.30	45
Old Ashford Hwy	Alabama	24	1	4.39	45
Old Hwy 84	Alabama	4	1	3.23	45
Old River Rd	Georgia	18	1	12.71	35
Pansey Rd	Alabama	24	1	10.43	45
Paul Lamp Rd	Alabama	4	1	2.76	45
Pleasant Grove Rd	Alabama	24	1	6.88	45
Powell Rd	Georgia	6	1	6.10	25
Ramp	Alabama	8	1	0.39	55

Road Name	State	Number of Links	Number of Lanes (max)	Length (miles)	Speed Limit (max)
Randall Wade Rd	Alabama	12	1	5.56	45
Rock Hill Rd	Georgia	12	1	5.04	35
Ross Clark Cir	Alabama	30	2	4.32	50
S Church Rd	Georgia	6	1	2.32	45
S CR-33	Alabama	18	1	7.47	45
S CR-55	Alabama	24	1	8.89	45
S Pearl St	Georgia	8	1	0.75	45
S Railroad St/Old Ashford Hwy	Alabama	34	1	4.39	45
Sid Hughes Rd	Alabama	2	1	1.57	0
Silcox Rd	Alabama	2	1	0.39	35
Sowhatchee Rd	Georgia	28	1	13.23	25
Spooner Quarter Rd	Georgia	24	1	18.44	45
State Route 273	Georgia	34	1	17.70	55
State Route 363	Georgia	4	1	1.61	55
State Route 370	Georgia	66	1	25.23	55
State Route 39	Georgia	60	1	32.66	55
State Route 62	Georgia	46	2	22.22	55
US Highway 84	Georgia	18	2	9.96	65
US Highway 84	Alabama	150	3	39.33	65
Wallace Buie Rd	Alabama	10	1	3.88	35
Webb-Kinsey Rd	Alabama	8	1	2.29	45
Whitaker Rd	Georgia	8	1	5.24	20
Wilkie Mosley Rd	Georgia	24	1	15.65	45

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APPENDIX 6(F)

SUPPORTING EMERGENCY PLANS

Plan	**Source**
NUREG 0728 NRC Incident Response Plan	U.S. NUCLEAR REGULATORY COMM.
Emergency Response Plan Water Reactors Division Westinghouse Electric Corporation	WESTINGHOUSE ELECTRIC CORP.
Inter Agency Radiological Assistance Plan U.S. Department of Energy Region 3 (For interim use and guidance)	U.S. DEPARTMENT OF ENERGY
State of Georgia Radiological Emergency Plan	STATE OF GEORGIA
Alabama Radiological Emergency Response Plan for Nuclear Power Plants	STATE OF ALABAMA
State of Florida Radiological Emergency Plan for Fixed Nuclear Facilities	STATE OF FLORIDA

APPENDIX 7(G)

EMERGENCY OPERATIONS FACILITY

A. INTRODUCTION

A.1 PURPOSE

The purpose of this appendix is to outline the function of the Emergency Operations Facility for the Southern Nuclear Operating Company (SNC). Additionally, this appendix delineates the actions to be taken by SNC Corporate Staff in the event of an emergency at any (SNC) site.

A.2 SCOPE AND APPLICABILITY

This appendix provides the framework for operations of the EOF for SNC. This appendix is an integral part of the site specific emergency plan(s).

This appendix may be implemented to coordinate a SNC response to an emergency at any SNC facility or in response to a transportation accident involving radioactive material.

Additionally, this appendix provides the mechanism for obtaining and providing additional emergency response support and resources to SNC site(s) in the event of an emergency.

The SNC Corporate Staff will be responsible for offsite emergency response support and resources as requested. Overall management of the emergency will be accomplished at the specific site(s)[Vogtle Electric Generating Plant (VEGP), Hatch Nuclear Plant (HNP) and Farley Nuclear Plant (FNP)].

A.3 SUMMARY

The site specific Emergency Plan, is activated by the Emergency Director (ED). Upon notification of an ALERT or higher classification or as directed by the ED, the EOF will be activated as described in emergency implementing procedures. When notified, the designated corporate emergency organization management report to the EOF to be briefed on current conditions and perform their assigned tasks. Each manager's support staff will operate from that group's office area. Offsite support personnel and equipment will be dispatched to the site Operations Support Center (OSC) or Technical Support Center (TSC)upon request from the specific site Emergency Director. The corporate emergency organization will provide offsite emergency response support and resources to SNC sites 24 hours per day until the emergency has been terminated.

The EOF will be activated for an ALERT, SITE AREA or GENERAL emergency classification. This facility will be operational within about an hour of the initial notification. SNC's goal is to begin notification of all required on-call Emergency Response Organization (ERO) personnel as soon as practicable, within 15 minutes, following the declaration of an Alert emergency or higher emergency classification at any SNC site. Minimum EOF staff for facility activation will include the EOF Manager, the Dose Assessment Supervisor, the Dose Analyst, the Field Team Coordinator, the ENN Communicator, and the Licensing Support Coordinator.

Access control for the EOF is established through the use of electronic card readers.

During the emergency, the emergency director will normally be located in either the TSC or Control Room at his/her option. The emergency director is responsible for the management of the emergency response. Specific duties and responsibilities are provided in the site specific Emergency Plan and Emergency Plan Implementing Procedures.

SNC has taken precautions to ensure that the EOF can be quickly accessed and made operational within about an hour of the initial notification and is safe-guarded against unauthorized personnel. The common EOF is located in a secure building. The building itself has posted security guards and video surveillance cameras. Any outside doors that do not have security guards are accessible only by SNC ID badges. Additionally, the EOF facility door is accessible only to people with ID badges that have been pre-approved for access. If an event were to occur during off-normal hours, a guard will be posted at the main entrance to Building 40 to allow access to offsite agency or other responders without pre-designated ID access.

B. EOF ORGANIZATION

The EOF Organization consists of selected management and staff members located in the SNC Corporate Office. This organization is responsible for providing offsite emergency response support and resources, as needed. The EOF Organization is displayed in Figure 1 and typical duty assignments are shown on Table 1. This organization may be supplemented or reduced by the EOF Manager, as required, to respond to the specific emergency situation but will not be reduced to below the minimum staff as specified in A.3 above.

SNC normally maintains ERO positions in a duty rotation. Several positions have been designated as plant specific and, as such, have personnel designated for each of the 3 sites. Specifically each of the following EOF positions has site-specific personnel designated:

- EOF Manager

- EOF Technical Supervisor

In order to augment additional staff that may be needed in the unlikely event of a multi-site accident, SNC will re-activate its ERO notification system. When the EOF is activated, all EOF staff pagers are activated, and all EOF personnel are expected to report to the EOF. Personnel that are not needed to augment positions are briefed and dismissed with a stand-by status.

B.1 EMERGENCY OPERATIONS FACILITY (EOF) MANAGER

The EOF Manager manages the following activities:

- Overall direction and control of the offsite response for SNC
- Communication of radiological information to State and local emergency response agencies as needed
- After consultation with the ED, provides support for initial activities associated with planning for recovery operations.

The duties and responsibilities of the EOF Manager will be assumed by designated SNC corporate personnel. The designated individual will be assigned according to a predetermined rotation schedule and will typically have either previous plant specific operational expertise or long-term supervisory/management experience.

The duties and responsibilities of the EOF Manager are as follows:

1. Manage the EOF and direct the activities of the EOF organization.
2. Ensure activation of the EOF at ALERT or higher classification, or as directed by the ED.
3. Support site efforts for the following:
    - Determining the cause of the incident.
    - Assessing the overall damage, including personnel, equipment, systems, facilities and/or fuel.
    - Developing recovery plans.
4. Keep corporate management informed regarding the emergency response and emergency classification upgrades.
5. Ensure that the joint owners, as applicable, are kept appraised of significant changes in the emergency status including upgrades and terminations.

6. Keep the GPC/APCO public information director fully appraised regarding the status of the emergency.
7. Identify the available resources within and outside the company to assist in mitigation and recovery, as necessary.
8. Procure outside services and equipment, as necessary.
9. Obtain assistance from SNC Environmental Services regarding non-radiological and hazardous materials environmental considerations.
10. Request assistance from legal counsel as appropriate.
11. Coordinate NRC inquiries/activities requiring a response from the Corporate Office. Obtain licenses and/or amendments to licenses, if required, for repair of the affected unit and disposal of waste products.
12. Approve news releases issued from the Emergency Response Center (ERC) or the Emergency News Center (ENC).
13. Communicate developed PARs to the ED once offsite communication responsibility is transferred to the EOF. The EOF Manager and ED will determine which facility will communicate the PARs to offsite agencies. Normally, initial PARs will be communicated to offsite agencies by the TSC while changes in PARs will be communicated to offsite agencies by the EOF.
14. Ensure that necessary support is provided to the SNC News writer, the SNC Spokesperson, and the Public Information Director to ensure timely and accurate information flow to the public. An unaffected EOF Manager will be available to assist the affected EOF Manager in Company Spokesperson interface activities.

B.2 EOF TECHNICAL SUPERVISOR

The duties and responsibilities of the EOF Technical Supervisor will be assumed by SNC corporate support personnel. The designated individual will be will be assigned according to a predetermined rotation schedule and will typically have plant specific long-term engineering/design experience. Reporting to the EOF Technical Supervisor are the emergency communicators and the necessary engineering technical, and licensing personnel needed to support tasks assigned to the EOF.

The duties and responsibilities of the EOF Technical Supervisor are as follows:

1. Provide technical interface to vendors, utility groups, consultants and technical investigation groups.
2. Assist in establishing a list of plant equipment/system modifications required to bring the plant to cold shutdown, recovery and/or startup.
3. Develop an engineering support plan compatible with the plant mitigation and recovery plan. Provide engineering support developing site recovery procedures. This plan will include engineering personnel resources.
4. Coordinate the work performed by SNC engineering, Southern Company Services, the architect engineer, the nuclear steam supply system supplier, and other engineering consultants. Coordinate the transmittal of engineering modification/design documents (Design Change Packages (DCP), Request for Engineering Assistance (REA), etc) to the site staff, and site and SNC procurement groups.
5. Coordinate the receipt and assessment of technical information related to plant systems and facility operations, and submit recommendations to the TSC Manager through the EOF Manager.
6. Provide licensing support, as requested, through utilization of the licensing support.
7. Provides communications support for offsite notifications (Emergency Notification Network(ENN), as requested.

B.3 EOF SUPPORT COORDINATOR

The duties and responsibilities of the EOF Support Coordinator will be assumed by SNC corporate support personnel. The individuals designated to assume the position will be indicated on a predetermined rotational schedule. Reporting to the EOF Support Coordinator are the non-technical personnel needed to support tasks assigned to the EOF. Additionally, the News writer is matrixed to the EOF Support Coordinator from the corporate communications organization.

The duties and responsibilities of the EOF Support Coordinator are as follows:

1. Provide assistance to the EOF Support Coordinator in the Technical Support Center (TSC) for ordering equipment and materials needed. Establish a standby list of personnel to provide additional technical support, as required.
2. Obtain materials, supplies, and equipment that are needed in the EOF.
3. Process expense accounts, distribute checks from payroll, and conduct other financial aspects of the emergency organization.
4. Provide logistics arrangements for support personnel called in to assist in the emergency, including communications hardware, transportation, food, and lodging.
5. Obtain assistance from corporate financial staff to communicate, as necessary, with banks, financial institutions, investors, joint owners and insurers regarding the emergency situation.
6. During the initial phase of the emergency, provide the official log of actions and the course of the emergency from the EOF.
7. Provide administrative services for the Corporate Emergency Response Organization, such as clerical, typing, and duplication.
8. Provide administrative, logistic, financial, and procurement support as appropriate during the recovery phase.

B.4 DOSE ASSESSMENT SUPERVISOR

The duties and responsibilities of the Dose Assessment Supervisor will be assumed by SNC corporate support personnel. The individuals designated to assume the position will be indicated on a predetermined rotation schedule. Reporting to the Dose Assessment Supervisor are the Dose Analyst, Field Team Coordinator, Field Team Communicator, and Radiological Status Communicator.

The TSC will initially be responsible for dose projection and field team control activities. When the EOF is activated and ready to assume functions of dose projection/assessment activities, then the EOF Dose Assessment Supervisor will coordinate transfer of dose assessment, field team control, and protective action determination from the TSC to the EOF. Coordination will include ED/EOF Manager mutual approval of the transfer with the intention of transferring dose assessment from the TSC to the EOF as rapidly as possible while ensuring a smoothly coordinated transfer of this critical function.

The duties and responsibilities of the Dose Assessment Supervisor are as follows:

1. Support the plant dose assessment supervisor as necessary. Be prepared to assume offsite dose projection if requested. Keep the EOF Manager informed of any offsite dose assessments performed by the site or corporate staff.
2. Provide an as low as reasonably achievable (ALARA) exposure review of engineering modifications and tasks proposed by the emergency organization, including necessary documentation of those reviews.
3. Develop methods for treatment and/or disposal of radioactive wastes resulting from the emergency and recovery operations.
4. Compare calculations and measurements with State and Federal groups performing radiological assessments.
5. Coordinate distribution of dose assessment information with offsite authorities.
6. Coordinate assistance to the State for transportation incidents involving radioactive material, as requested.
7. Develop protective action recommendations (PARs) and communicate to the EOF Manager the need for PAR communication once control is transferred to the EOF.

B.5 SECURITY COORDINATOR

The duties and responsibilities of the Security Coordinator will be assumed by SNC corporate security personnel. The individuals designated to assume the position will be indicated on a predetermined rotation schedule.

The duties and responsibilities of the Security Coordinator are as follows:

1. Support the plant security manager as necessary. Keep the EOF Manager informed of any security events/issues.
2. Provide assistance to the security supervisor at the site, as requested.
3. Establish and maintain access control for the EOF.

B.6 Offsite Response Coordinator

The duties and responsibilities of the Offsite Response Coordinator will be assumed by SNC Corporate Emergency Planning Coordinators and designated staff. The individuals designated to assume the position will be indicated on a predetermined rotation schedule.

The duties and responsibilities of the Offsite Response Coordinator are as follows:

1. Coordinate activities concerning the dispatch and update of technical liaisons to State and Local authorities, as appropriate.
2. Monitor EOF functional areas to facilitate coordination between the licensee and State and Local agencies.

B.7 ENGINEERING/TECHNICAL SUPPORT STAFF AND ADMINISTRATIVE SUPPORT STAFF

1. The Engineering/Technical Support staff and administrative support staff will report to the EOF, as directed. These job titles refer to a number of individuals performing a variety of designated tasks. Their numbers will depend on the type and duration of the emergency.
2. The Engineering/Technical Support staff are personnel designated by the management of the Corporate Emergency Organization. They provide management, technical, regulatory and licensing support during an emergency. This staff reports through the EOF Technical Supervisor to the EOF Manager.

3. The administrative support staff are the non-technical members of the Corporate Emergency Response Organization. They perform duties designated by the EOF Support Coordinator or appropriate manager which include but are not limited to the following:

   a. Providing clerical and secretarial support to the Emergency Organization.

   b. Operation of word processors.

   c. Operation of telecopiers.

   d. Making entries to and retrieving data from Nuclear Network.

   e. Retrieval of file documents.

   f. Updating status boards using information provided from the sites.

C. NOTIFICATION AND ACTIVATION

Initial notifications or emergency response personnel will follow the guidelines specified in the site specific Emergency Plan and Emergency Plan Implementing Procedures. This appendix contains the emergency notification of Corporate Management and the appropriate offsite support groups not specified in the site specific Emergency Plan(s).

C.1 NOTIFICATION OF CORPORATE MANAGEMENT

The On-call EOF Manager will be notified of all emergencies classified at any SNC site. The EOF Manager is responsible for activation of the EOF Staff and notifying the appropriate Corporate Management.

1. The EOF Manager is responsible for assuring that the Corporate Emergency Organization is notified
2. The EOF Manager will also be responsible for ensuring that the corporate emergency staff members report directly to the EOF.
3. Notification of personnel may be accomplished through the use of an automated or manual system.

C.2 NOTIFICATION OF OFFSITE SUPPORT AGENCIES

Offsite support agencies will be notified by the appropriate emergency organization member(s), as requested by VEGP, FNP, and HNP.

D. EMERGENCY FACILITIES AND EQUIPMENT

Following the declaration of an emergency, response activity will be coordinated at a number of facilities. These emergency response facilities are described in the site specific emergency plans. The EOF is a common facility for all SNC sites and is described in this section.

D.1 EOF DESCRIPTION

The EOF is the central location for management of the offsite emergency response, coordination of radiological assessment, and management of initial recovery operations. The EOF is located in Birmingham, Alabama and serves as the EOF for all SNC sites (VEGP, FNP, and HNP). The EOF will be activated as prescribed in the site specific Emergency Plan implementing procedures. From the EOF, SNC corporate management personnel assist the states and other governmental bodies by communicating protective action recommendations approved by the Emergency Director to ensure public health and safety. Plant systems information, radiological data, and meteorological data are provided via the SNC Integrated Data Display System to EOF personnel as needed to: assess environmental conditions, coordinate radiological monitoring activities, and recommend implementation of offsite emergency plans. Data displays provide periodic and timely conditions of the affected plant and periodic and timely assessment of radiological conditions in the plant environs.

The SNC integrated data display system utilizes data provided by the plant specific data links. These station data links are described in each site specific plan. These displays may be either manual or electronic. Data displays are located in the main caucus area of the EOF, dose assessment area, plant status area, and engineering area within the facility. Other displays may be located in the command center area. Data is also available to all state agencies responding to the EOF. Data is available both in the main caucus area and the area designated for the particular state agency. Similarly, this data is available to state and local authorities via a secure network dedicated to data distribution among the various offsite emergency response facilities. The data display system provides the user with a "master view" for the monitoring of multiple site events simultaneously. Data required to support EOF operations is provided by an extensive ring bus transport network. Data may also be obtained manually via telephone from the Control Room and the TSC to the EOF.

Contained within the facility will be the manpower and equipment necessary to provide dedicated direct communication links to the plant site(s). In addition, there are commercial and company wide phone systems to and from the site(s). A communication link will be established and maintained between the Emergency Operations Facility and the Technical Support Center (TSC) until the emergency director determines that the communication link is no longer needed. Other communications equipment accessible to the EOF includes Nuclear Network (an intra-industry computer-based information exchange network), telecopiers, and computer workstations designated for emergency use. Computer workstations are dedicated for performing dose assessment for multiple sites.

The EOF is the distribution center for all field data and sample analyses. This information will be available to county, State, and Federal representatives. The EOF is sized to accommodate 35 persons, including 25 pre-designated persons, 9 persons from the NRC, and 1 person from the Federal Emergency Management Agency (FEMA). Provisions have also been made for the relocation of NRC staff (including NRC communications capabilities) from the EOF to a near-site location, if requested. It is anticipated that representatives from the state(s) of Georgia, South Carolina, Alabama, and Florida will be dispatched to the EOF for an event at specific SNC site(s). The EOF has been designed to accommodate these representatives. Agreements exist between the appropriate State agencies and SNC to ensure rapid response of state personnel dispatched to the EOF. Table 4 provides additional information concerning EOF communications capabilities.

Upon activation of the EOF, Corporate personnel will provide staffing 24 hours per day until directed otherwise by the Emergency Director.

The emergency director, located at the affected site(s), is responsible for the management of the emergency response. Specific duties and responsibilities are provided in the site specific Emergency.

The EOF consists of several rooms, as shown, together with the location of key personnel, in Figure 2. The EOF is a dedicated facility. The designated emergency planning coordinator for each of the three sites maintains an office within the EOF to ensure readiness and daily operability.

Based on the physical location of the EOF, specialized ventilation systems are not required. The EOF ventilation system is consistent in design with

standard building codes. Similarly, EOF functions would not be interrupted by radiation releases from any SNC site.
Normal power to the EOF is from a reliable offsite source. Emergency lighting is provided by battery operated lights. Back-up power for the EOF is supplied by onsite diesel generation. All essential equipment is backed up by the diesel generation system.

The EOF is located adjacent to the document management section for SNC. The following records or information are available:

- Technical Specifications.
- Selected plant operating procedures.
- Emergency Plans.
- Emergency Plan Implementing Procedures.
- FSARs.
- State and local emergency response plans.
- Savannah River Site Emergency Plan.

The following records or information can be transmitted to the EOF manually, electronically or by facsimile:

- Environs radiological monitoring records.
- SNC employee radiation exposure histories.
- System piping and instrumentation diagrams and HVAC flow diagrams.
- Piping area diagrams.
- Electrical one-line, elementary, and wiring diagrams.

The above records or information are available in current form and updated as necessary to ensure currency and completeness.
Operations at this facility are directed by the EOF manager.

D.2 Contingency Planning

Optimum functionality and availability was considered in the decision to locate the EOF in Birmingham, Alabama. At this location, functionality of the EOF would be uninterrupted by radiation releases, natural phenomena, and security based events at any of the SNC sites. Support operations and coordination with Federal, State and local organizations would continue. If personnel were to be dispatched to the sites, then personal protection equipment would be available from the local emergency management agency or from one of the unaffected SNC plant sites.

In the unlikely event that individuals should need to respond to the EOF from within the 10 mile EPZ of any SNC plant, they would be surveyed prior to release by local emergency authorities at the reception centers in accordance with State and Local emergency response plans.

In the unlikely event that the EOF becomes uninhabitable, resources and personnel will be transferred to the Corporate Headquarters of Alabama Power Company, located in Birmingham, Alabama. These actions will be taken as part of the normal business continuity plan.

E. COORDINATION WITH GOVERNMENTAL AGENCIES

The site specific Emergency Plan(s) delineate the governmental agencies to be notified and specifies the information to be initially conveyed. It is anticipated that representatives of various agencies will be dispatched to the EOF for an event at an SNC facility. Arrangements have been made between the appropriate State agencies and SNC to ensure rapid response of state personnel dispatched to the EOF.

E.1 U.S. NUCLEAR REGULATORY COMMISSION

Coordination with the U.S. Nuclear Regulatory Commission (NRC) may be underway at several locations simultaneously. For details of the NRC response, see the NRC Incident Response Plan NUREG 0728.

Initial notification of the NRC will proceed as specified in the site specific Emergency Plan. The resident NRC inspector(s) and plant personnel have direct communications from the site control room to the NRC headquarters in Rockville, Maryland. and to the regional headquarters in Atlanta, Georgia.

The resident inspector(s) may be reinforced by additional NRC personnel shortly after notification of an emergency. The Emergency Director is responsible for coordinating NRC activities to reduce duplication of effort and reduce impact on the plant staff during the emergency situation.

Provisions have been made to have direct NRC FTS lines in the TSC and the EOF during an emergency. This will allow personnel in the control room to continue responding to the emergency while personnel in the TSC or EOF respond to questions and input from the NRC.

NRC activities requiring response from the licensee will be coordinated by the EOF Technical Coordinator through the EOF manager.

E.2 STATE GOVERNMENTAL AGENCIES

The government notifications are outlined in the site specific Emergency Plan(s). Coordination of offsite responses to the emergency is the responsibility of State agencies as outlined in the State Radiological Emergency Response Plans.

E.3 LOCAL GOVERNMENTAL AGENCIES

Notification of local government officials is outlined in the site specific Emergency Plan(s). Coordination with local government agencies will normally be through the responsible State agency.

E.4 DEPARTMENT OF ENERGY

Notification of DOE officials is outlined in the site specific Emergency Plan.

F. OFFSITE SUPPORT

Offsite resources that may be available to support an emergency response effort include, but are not limited to, the following:

1. Southern Nuclear Operating Company
2. Georgia Power Company
3. Alabama Power Company
4. Southern Company Services, Inc.
5. The architect engineers
6. NSSS supplier
7. Nuclear industry
8. Contract laboratories

F.1 SOUTHERN NUCLEAR OPERATING COMPANY (SNC)

1. SNC is divided into three projects: the Farley Project, the Hatch Project, and the Vogtle Project. Each of the projects is further divided into a plant staff and a corporate staff. These represent a pool of positions of which approximately two-thirds would be additional assets that could be made available to support an individual site emergency organization, as required.

   a. Plant Staffs - The permanent plant staffs consist of personnel who possess expertise in at least one of the following areas: operations, maintenance, engineering, administration, or technical support. These personnel would be available to assist in an emergency or recovery situation at an SNC nuclear facility.

b. Corporate Staffs - These staffs consist of personnel who provide management, technical, clerical, procurement, and regulatory support to the nuclear facilities.

F.2 GEORGIA POWER COMPANY (GPC)

1. The GPC Fossil and Hydro Power Generation Department is responsible for the operations and maintenance of all GPC non-nuclear generating facilities including diesel and combustion turbine facilities. This represents a large source of technical expertise which could provide support to the emergency organization, if required.
2. The GPC Power Delivery Department manages the activities of the divisions and areas of the company which provide the electrical services to customers. This organization has a large resource of people and heavy equipment which may be of assistance following a nuclear emergency.
3. Other GPC assets, including maintenance and repair facilities, training facilities, engineering staffs, and headquarters personnel represent additional resources available for emergency support.
4. The GPC Central Laboratory has personnel and facilities available to provide offsite monitoring, sample analysis, and dosimetry processing for the affected site.

F.3 ALABAMA POWER COMPANY (APCO)

1. The APCO Fossil and Hydro Power Generation Department is responsible for the operations and maintenance of all APCO non-nuclear generating facilities including diesel and combustion turbine facilities. This represents a large source of technical expertise which could provide support to the emergency organization, if required.
2. The APCO Power Delivery Department manages the activities of the divisions and areas of the company which provide the electrical services to customers. This organization has a large resource of people and heavy equipment which may be of assistance following a nuclear emergency.
3. Other APCO assets, including maintenance and repair facilities, training facilities, engineering staffs,

and headquarters personnel represent additional resources available for emergency support.

F.4 SOUTHERN COMPANY SERVICES, INC. (SCS)

1. SNC has the primary responsibility for engineering support of VEGP, FNP and HNP. SCS may be utilized in response to a plant emergency or for subsequent recovery operations as deemed necessary by SNC.

F.5 ARCHITECT ENGINEERS

The architect engineers will provide support as requested through the engineering services manager. The architect engineers are SNC and Bechtel Power Corporation.

1. SNC serves as its own Architect/Engineer. SCS, an associate company to Southern Nuclear Operating Company, will be used to the extent appropriate in responding to nuclear emergencies.

2. Bechtel Power Corporation, headquartered in Gaithersburg, Maryland, also performs architect engineer services for SNC. Bechtel's technical staffs are engaged in all phases of public utility engineering, design, construction, purchasing, inspection, and expedition of materials, as well as consultation on utility operating matters. Bechtel has available a broad range of engineering, construction, and consulting experience. Bechtel's nuclear experience includes engineering studies, the evaluation of reactor systems, safety evaluations, detailed engineering design, construction, and startup and testing of nuclear power facilities.

F.6 NUCLEAR STEAM SUPPLY SYSTEM VENDOR

The applicable NSSS vendor will provide support through the engineering services manager. Plant specific references to the appropriate vendor are specified in the plant specific base plans. The NSSS maintains a large staff of technically qualified people in all the engineering disciplines related to the design, construction, and operation of a nuclear power plant. These same skills would be necessary in the evaluation of, and recovery from, an emergency at any SNC site. Assistance would most likely be sought for large-scale core analysis, special tool design, and licensing.

F.7 NUCLEAR INDUSTRY

The nuclear industry provides a large reservoir of personnel with a wide range of technical expertise and knowledge. A nuclear industry national inventory of personnel who might be called upon to supplement Company personnel has been developed through the Institute of Nuclear Power Operations (INPO).

In addition, a number of utilities have entered into an INPO coordinated Voluntary Assistance Agreement program. This provides a mechanism to draw upon industry resources during an emergency.

Support may be called upon from neighboring utilities would include the following:

1. Manpower and equipment to assist in in-plant and emergency field monitoring.
2. Engineering, design, and technical expertise to assist in determining the cause of the accident and to support recovery.
3. Manpower and equipment to assist in maintenance and repairs to the facility.

F.8 CONTRACT LABORATORIES

Teledyne Isotopes, Inc. for emergency analytical services.

Framatome ANP for emergency analytical services

G. MAINTAINING EMERGENCY PREPAREDNESS

G.1 ORGANIZATIONAL PREPAREDNESS

1. Training

Corporate personnel identified in the Emergency Response Organization receive training. The training consists of familiarization with the Site Emergency Plans and applicable emergency implementing procedures required to carry out their specific functions.

The corporate emergency planning coordinator(s) will ensure that personnel in the Corporate Emergency Response Organization are familiar with the Emergency Plans and able to respond promptly. A training matrix for corporate personnel assigned to the ERO is shown in Table 2, and training course summaries are presented in Table 3. Training will be documented in accordance with established practices.

The corporate emergency planning coordinator(s) are responsible for assuring that training is conducted for corporate emergency response personnel each calendar year.

2. Drills/Exercises

Drills/ exercises will be conducted each calendar year to test the performance of implementing procedures, personnel, and emergency equipment. These drills/exercises will be conducted with each SNC site.

SNC's goal is to activate the EOF in support of all site activities that involve TSC activation. EOF activation is required at least 3 times annually (1 scenario per site per year) in accordance with the existing Emergency Plans. At least 1 activation every 5 years will require a concurrent EOF support response for more than one SNC site.

Each drill/exercise will test, as a minimum, the communication links and notification procedures to assure the prompt notification of the corporate staff.

Provisions are made for critique of all drills/exercises. Critique items will be forwarded to the site emergency preparedness coordinator for processing in the site specific corrective action program.

G.2 REVIEW AND UPDATE OF PLAN AND PROCEDURES

Reviews of the site Emergency Plan and Emergency Plan Implementing Procedures will be performed in accordance with site specific emergency plans. These reviews will be utilized to update the Plans and procedures and to improve emergency preparedness.

TABLE 1

TYPICAL CORPORATE EMERGENCY ORGANIZATION ASSIGNMENTS

EMERGENCY POSITION	ASSIGNMENT
EOF Manager	• Supervision from corporate staff as designated in NMP-EP-001
EOF Technical Supervisor	• Corporate staff as designated in NMP-EP-001
EOF Support Coordinator	• Corporate staff as designated in NMP-EP-001
EOF Dose Assessment Supervisor	• Corporate staff as designated in NMP-EP-001
Dose Analyst	• Corporate staff as designated in NMP-EP-001
Field Team Coordinator	• Corporate staff as designated in NMP-EP-001
Field Team Communicator	• Corporate staff as designated in NMP-EP-001
Radiological Status Communicator	• Corporate staff as designated in NMP-EP-001
Plant Status Loop Communicator	• Corporate staff as designated in NMP-EP-001
ENN Communicator	• Corporate staff as designated in NMP-EP-001
ENS Communicator	• Corporate staff as designated in NMP-EP-001
Licensing Support Coordinator	• Corporate staff as designated in NMP-EP-001
Security Coordinator	• Corporate staff as designated in NMP-EP-001
Offsite Response Coordinator	• Corporate staff as designated in NMP-EP-001
Engineering/Technical Support Staff	• Corporate staff as designated in NMP-EP-001
Administrative Support Staff	• Corporate staff as designated in NMP-EP-001
Liaisons	• Corporate staff as designated in NMP-EP-001
Public Information Director	• Corporate staff as designated in NMP-EP-001
Company Spokesperson	• Corporate staff as designated in NMP-EP-001
News writer	• Corporate staff as designated in NMP-EP-001
Other Public Information Emergency Communications Organization Staff	• Corporate staff as designated in NMP-EP-001

TABLE 2
CORPORATE EMERGENCY ORGANIZATION TRAINING MATRIX

Position	Subject Area		
	Emergency Plan Overview	**Position Specific Items**	**Offsite Dose Assessment**
EOF Manager	X	X	
EOF Technical Supervisor	X	X	
EOF Support Coordinator	X	X	
EOF Dose Assessment Supervisor	X	X	X
Dose Analyst	X	X	X
Field Team Coordinator	X	X	X
Field Team Communicator	X	X	
Radiological Status Communicator	X	X	
Plant Status Loop Communicator	X	X	
ENN Communicator	X	X	
ENS Communicator	X	X	
Licensing Support Coordinator	X	X	
Security Coordinator	X	X	
Offsite Response Coordinator	X	X	
Engineering/Technical Support Staff	X	X	
Administrative Support Staff	X	X	
Liaisons	X	X	
Public Information Director	X	X	
Company Spokesperson	X	X	
News writer	X	X	
Other Public Information Emergency Communications Organization Staff	X	X	

TABLE 3

DESCRIPTION OF TRAINING SUBJECT AREAS

Subject Area	Description
Emergency Plan Overview	An overview of the Emergency Plan with special attention to emergency planning zones (EPZs); emergency classification system; emergency response organizations; responsibilities of emergency response personnel; site accountability; and site dismissal.
Offsite Dose Assessment	Dose projection methodology including manual and computerized methods; methods for obtaining meteorological and radiological data; operation of the dose assessment computer; and interpretation of offsite dose calculation results.
Position Specific Items	An overview of this appendix with an emphasis on organization, interactions with other elements of the emergency organization, and position specific responsibilities as delineated in the emergency implementing procedures. This overview training may be conducted as part of classroom, table-top, drill, or exercise.

TABLE 4

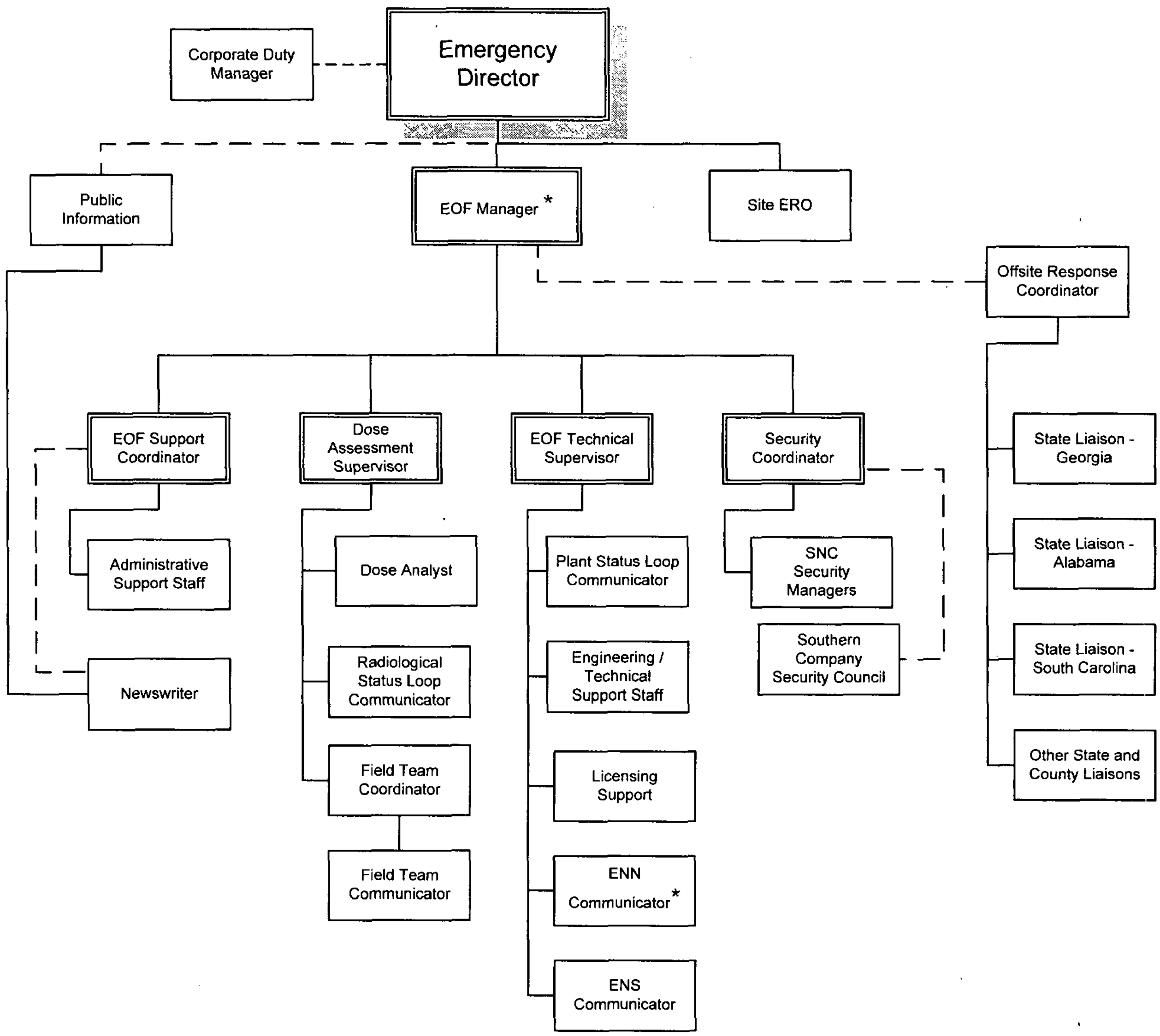
TYPICAL EOF COMMUNICATION CAPABILITY

Communications Functions	VEGP	HNP	FNP
EOF Management with TSC	Commercial Telephone lines TSC/EOF/OSC Conference Bridge Radio	Commercial Telephone lines TSC/EOF/OSC Conference Bridge Radio	Commercial Telephone lines TSC/EOF/OSC Conference Bridge Radio
Resource Management	Commercial Telephone lines OPX Public Address System	Commercial Telephone lines OPX Public Address System Ringdown	Commercial Telephone lines OPX Public Address System
Radiological Monitoring	Southern LINC Kenwood Radio System	Southern LINC Kenwood Radio System	Southern LINC Kenwood Radio System
Off-site (PARs)	ENN	ENN	ENN
NRC Use	ENS HPN RSCL PMCL MCL LAN Conference Phones (3)		

Notes:

1. The Offsite Premises Extension (OPX) lines to the three SNC plant sites bypass the local phone switch. These lines may be referenced as company tie lines.
2. Intra-facility public address and intra-building public address systems are also available.

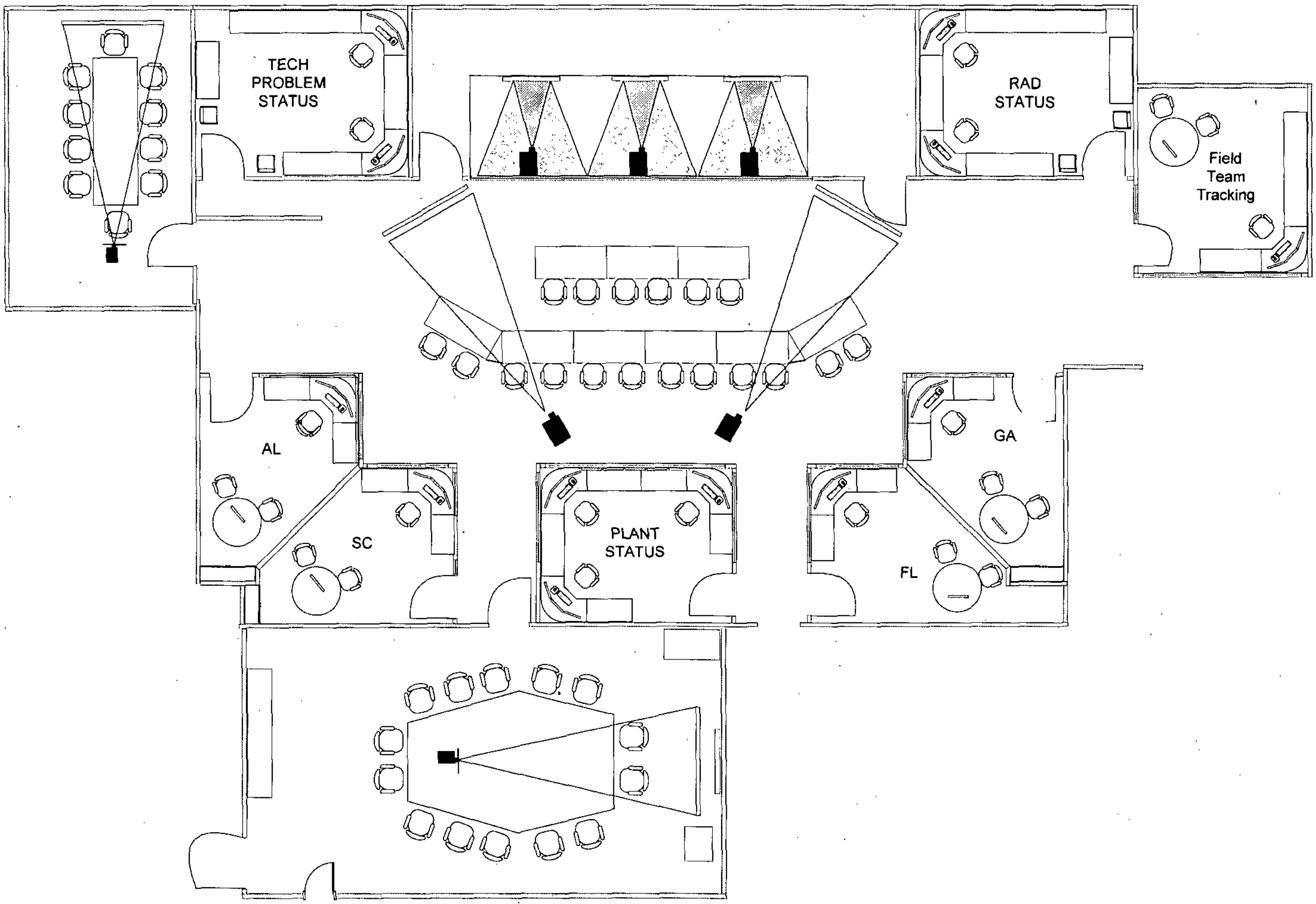
Figure 1



* Positions used to meet augmentation requirements for EOF direction and notification/communication.

FIGURE 2

EOF LAYOUT



NUREG 0654 Rev.1 Ref. Section	FNP EP Ref. Section
A.1.a	Part I, Sec.II.C, App. 7(G)
A.1.b	Part I, Sec.II.A
	Part I, Sec.II.B
A.1.c	Part I, Fig. 12
	Part I, Fig. 13
A.1.d	Part I, Sec.II.A
	Part I, Sec.II.B
A.1.e	Part I, Sec.II.A
A.2.a	N/A
A.2.b	N/A
A.3	Part I, App. B
A.4	Part I, Sec.II.A.1, App. 7(G)
	Part I, Sec.II.B.2.a
	Part I, Sec.V.B.1
B.1	Part I, Sec.II.A
B.2	Part I, Sec.II.A.1
	Part I, Sec.V.A
B.3	Part I, Sec.II.A.1
B.4	Part I, Sec.II.A.1
B.5	Part I, Sec.II.A
	Part I, Sec.II.B, App. 7(G)
	Part I, Sec.V.B
B.6	Part I, Sec.II.A, App. 7(G)
	Part I, Sec.II.B, App. 7(G)
	Part I, Fig. 12
	Part I, Fig. 13
B.7	Part I, Sec.II.B, App. 7(G)
B.7.a	Part I, Sec.II.B.1, App. 7(G)
	Part I, Sec.II.B.2
B.7.b	Part I, Sec.II.B.3, App. 7(G)
B.7.c	Part I, Sec.II.B.2, App. 7(G)
B.7.d	Part I, Sec.II.B.2
B.8	Part I, Sec.II.C.2, App. 7(G)
B.9	Part I, Sec.II.C.2
B.5	Part I, Sec.III.D.3
	Part I, Sec.III.D.4
	Part I, App.B
C.1.a	Part I, Sec.II.C.1.a
C.1.b	Part I, Sec.II.C, App. 7(G)
C.1.c	Part I, Sec.III.A
C.2.a	N/A
C.2.b	Part I, Sec.II.C.1, App. 7(G)
C.3	Part I, Sec.II.C.2, App. 7(G)
C.4	Part I, Sec.III.C.2, App. 7(G)
D.1	Part I, Sec.IV.A
D.2	Part I, Sec.IV.A
D.3	N/A
D.4	N/A

NUREG 0654 Rev.1 Ref. Section	FNP EP Ref. Section
E.1	Part I, Sec.VI.A
E.2	Part I, Sec.V, App. 7(G)
E.3	Part I, Sec.VI.B.1
E.4	Part I, Sec.VI.A
E.4.a	Part I, Sec.VI.A
E.4.b	Part I, Sec.VI.A
E.4.c	Part I, Sec.VI.A
E.4.d	Part I, Sec.VI.A
E.4.e	Part I, Sec.VI.A
E.4.f	Part I, Sec.VI.A
E.4.g	Part I, Sec.VI.A
E.4.h	Part I, Sec.VI.A
E.4.i	Part I, Sec.VI.A
E.4.j	Part I, Sec.VI.A
E.4.k	Part I, Sec.VI.A
E.4.l	Part I, Sec.VI.A
E.4.m	Part I, Sec.VI.A
E.4.n	Part I, Sec.VI.A
E.5	N/A
E.6	Part I, Sec.VI.B.1
E.7	Part I, Sec.VI.B.1, App. 10(J)
F.1.a	Part I, Sec.III.B.11, App. 7(G)
F.1.b	Part I, Sec.III.B, App. 7(G)
F.1.c	Part I, Sec.III.B, App. 7(G)
F.1.d	Part I, Sec.III.B, App. 7(G)
F.1.e	Part I, Sec.V, App. 7(G)
	Part I, Sec.VI
F.1.f	Part I, Sec.III.B.9, App. 7(G)
	Part I, Sec.III.B.10
F.2	Part I, Sec.III.B
	Part I, Sec.III.D.3
F.3	Part I, Sec.VIII.C.4
G.1	Part I, Sec.VI.B.2, App.10(J)
G.2	Part I, Sec.VI.B.2, App. 10(J)
G.3.a	Part I, Sec.II.B.2, App. 10(J)
	Part I, Sec.III.A.5
G.3.b	Part I, Sec.III.A.5, App. 10(J)
G.4.a	Part I, Sec.II.B.2.a, App. 10(J)
G.4.b	Part I, Sec.VI.B.3, App. 10(J)
G.4.c	Part I, Sec.VI.B.3, App. 10(J)
G.5	Part I, Sec.VI.B.2.b, App. 10(J)
H.1	Part I, Sec.III.A.1
	Part I, Sec.III.A.4
H.2	Part I, Sec.III.A.2, App. 7(G)
	Part I, Sec.III.A.3
H.3	N/A
H.4	Part I, Sec.IV, App. 7(G)
H.5	Part I, Sec.IV
H.5.a	Part I, Sec.III.c.1.a

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H.5.b	Part I, Sec.III.C.1.b
H.5.c	Part I, Sec.IV
H.5.d	Part I, Sec.III.C.1.d
H.6.a	Part I, Sec.III.C1.a
H.6.b	Part I, Sec.III.C.2
	Part I, Sec.III.C.3
H.6.c	Part I, Sec.III.C.2
H.7	Part I, Sec.III.C.2
H.8	Part I, Sec.III.C.1.a, App.7(G)
H.9	Part I, Sec.III.A.4
	Part I, Sec.III.D.1
H.10	Part I, Sec.VIII.C
H.11	Part I, App.A
H.12	Part I, Sec.III.A.2, App.7(G)
I.1	Part I, Sec.IV
I.2	Part I, Sec.III.C.1.b
	Part I, Sec.III.C.1.c
	Part I, Sec.IV.B
I.3.a	Part I, Sec.III.C.1.b
I.3.b	Part I, Sec.III.C.2
I.4	Part I, Sec.III.C.2
I.5	Part I, Sec.III.C.2, App. 7(G)
I.6	Part I, Sec.III.C.2
I.7	Part I, Sec.III.C.2
I.8	Part I, Sec.II.A.9
	Part I, Sec.IV.B.5.a
	Part I, Sec.V.B.1
I.9	Part I, Sec.III.C.2
I.10	Part I, Sec.IV.B.4
	Part I, Sec.IV.B.5
I.11	N/A
J.1.a	Part I, Sec.IV.C.1
J.1.b	Part I, Sec.IV.C.1
J.1.c	Part I, Sec.IV.C.1
J.1.d	Part I, Sec.IV.C.1
J.2	Part I, Sec.IV.C.1
J.3	Part I, Sec.IV.C.1
J.4	Part I, Sec.IV.C.1
J.5	Part I, Sec.IV.C.1
J.6.a	Part I, Sec.IV.C.1
J.6.b	Part I, Sec.IV.C.1
J.6.c	Part I, Sec.IV.C.1.c
J.7	Part I, Sec.IV.C.2
J.8	Part I, App. E
J.9	N/A
J.10.a	Figure 17
	Figure 19
	Figure 20
	Figure 21
J.10.b	Part I, Sec.IV.C.2
J.10.c	Part I, Sec.VI.B.1
J.10.d	NA
J.10.e	N/A
J.10.f	N/A

NUREG 0654 Rev.1 Ref. Section	FNP EP Ref. Section
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	Part I, Sec.IV.C.2
J.11	N/A
J.12	N/A
K.1.a	Part I, Sec.IV.C.1.c
K.1.b	Part I, Sec.IV.C.1.c
K.1.c	Part I, Sec.IV.C.1.c
K.1.d	Part I, Sec.IV.C.1.c
K.1.e	Part I, Sec.IV.C.1.c
K.1.f	Part I, Sec.IV.C.1.c
K.1.g	Part I, Sec.IV.C.1.c
K.2	Part I, Sec.IV.C.1.c
K.3.a	Part I, Sec.III.C.3
	Part I, Sec.IV.C.1.c
K.3.b	Part I, Sec.III.C.3
K.4	N/A
K.5.a	Part I, Sec.IV.C.1.c
K.5.b	Part I, Sec.III.D.2
	Part I, Sec.IV.C.1.c
K.6.a	Part I, Sec.IV.C.1.c
K.6.b	Part I, Sec.IV.C.1.c
K.6.c	Part I, Sec.IV.C.1.c
	Part I, Sec.IV.A.4
K.7	Part I, Sec.IV.C.1.c
L.1	Part II, Sec.II.B
	Part II, Sec.II.C
	Part II, Sec.II.D
L.2	Part I, Sec.III.D.2
L.3	N/A
L.4	Part I, Sec.III.D.3
M.1	Part I, Sec.V11
M.2	Part I, Sec.II.B.3
M.3	Part I, Sec.VII
M.4	Part I, Sec.IV.B.4
N.1.a	Part I, Sec.VIII.A.1
N.1.b	Part I, Sec.VIII.A.1
N.2.a	Part I, Sec.VIII.C
N.2.b	Part I, Sec.VIII.A.2.a
N.2.c	Part I, Sec.VIII.A.2.b
N.2.d	Part I, Sec.VIII.A.2.c
N.2.e(1)	Part I, Sec.VIII.A.2.d
N.2.e(2)	Part I, Sec.VIII.A.2.d
N.3.a	Part I, Sec.VIII.A
N.3.b	Part I, Sec.VIII.A
N.3.c	Part I, Sec.VIII.A
N.3.d	Part I, Sec.VIII.A

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N.3.e	Part I, Sec.VIII.A		
N.3.f	Part I, Sec.VIII.A.1.c		
	Part I, Sec.VIII.A.1.d		
	Part I, Sec.VIII.A.2.e		
N.4	Part I, Sec.VIII.A.1.e		
N.5	Part I, Sec.VIII.A.1.e		
O.1	Part I, Sec.VIII.B, App. 7(G)		
O.1.a	Part I, Sec.VIII.B.3		
O.1.b	N/A		
O.2	Part I, Sec.VIII.A		
	Part I, Sec.VIII.A.2		
O.3	Part I, Sec.VIII.B.1.c		
O.4.a	Part I, Sec.VIII.B.1.a, App. 7(G)		
	Part I, Sec.VIII.B.2.a		
O.4.b	Part I, Sec.VIII.B.I.a		
	Part I, Sec.VIII.B.2.a		
O.4.c	Part I, Sec.VIII.B.1.b, App. 7(G)		
O.4.d	Part I, Sec.VIII.B.1.d		
	Part I, Sec.VIII.B.1.f		
O.4.e	Part I, Sec.VIII.B.1.e		
O.4.f	Part I, Sec.VIII.B.1.c		
O.4.g	Part I, Sec.VIII.B.3		
O.4.h	Part II, Sec.VI.C		
	Part II, Sec.VI.D		
O.4.i	Part I, Sec.VIII.B.2, App. 7(G)		
O.4.j	Part I, Sec.VIII.B.1.g, App. 7(G)		
O.5	Part I, Sec.VIII.B, App. 7(G)		
P.1	Part I, Sec.VIII.B.4		
P.2	Part I, Sec.I.B, App. 9(I)		
P.3	Part I, Sec.I.B, App. 9(I)		
P.4	Part I, Sec.VIII.D, App. 9(I)		
P.5	Part I, Sec.VIII.D, App 9(I)		
P.6	Part I, App. F		
P.7	Part I, App. D		
P.8	Part I, Table of Contents		
P.9	Part I, Sec. VIII.D, App 9(I)		
P.10	Part I, Sec.VIII.C.4		

APPENDIX 9(I)

RESPONSIBILITY FOR THE PLANNING EFFORT

I-i Rev. 42

Responsibility for the Emergency Planning Effort

The Executive Vice President/Chief Nuclear Officer (CNO) Southern Nuclear Operating Company(SNC) has overall responsibility and authority for all nuclear activities, including the emergency planning (EP)program. Reporting to the Executive Vice President is the Vice President Fleet Operations Support and the Vice President - (Plant).

Vice President Fleet Operations Support has Fleet responsibility for emergency planning. His direct report, the Nuclear Fleet Security and Emergency Preparedness Manager has overview management responsibility for the Fleet SNC Emergency Planning program effort . The Emergency Planning Supervisor reporting through the Nuclear Fleet Security and Emergency Preparedness Manager is responsible for overseeing emergency planning activities offsite and coordinating those activities with Licensee, Federal, State and local response organizations. The Emergency Planning Coordinator reports through the Emergency Planning (EP)Supervisor in support of this effort.

Vice President - (Plant) is responsible for the site Emergency Preparedness program. The Emergency Preparedness Supervisor, stationed at the plant site, is responsible for coordinating emergency preparedness activities onsite and in the vicinity of the plant. The Emergency Preparedness Supervisor reports through the Site Support Manager to the Vice President - (Plant).

The Emergency Planning Supervisor provides strategic direction for SNC emergency planning; the Emergency Preparedness Supervisor is responsible to the Site Support Manager for strategy implementation. The Emergency Planning Coordinator coordinates site input and involvement in emergency planning programs with the Emergency Preparedness Supervisor. The Emergency Preparedness Supervisor is responsible for the implementation of the Emergency Plan and procedure development and maintenance. Figure P-1 shows the Emergency Preparedness Organization. The EP Supervisor, Emergency Planning Coordinator, Emergency Preparedness Supervisor, and other individuals with emergency planning responsibilities are trained by self-study and by attending industry seminars, short courses, workshops, etc.

The Emergency Plans are maintained by the Nuclear Fleet Security and Emergency Preparedness Manager with the Emergency Planning Supervisor being the principal emergency planning contact. Onsite Emergency Plan Implementing Procedures (EIPs) are maintained by the Site Support Manager with the Emergency Preparedness Supervisor being the principal emergency preparedness site contact. EIPs for the corporate emergency response organization are maintained by the Emergency Planning Supervisor. The Emergency Preparedness Supervisor performs a review of the site specific emergency plan annually and all onsite EIPs biennially. The review includes the letters of agreement, which are updated as necessary.

The Emergency Planning Supervisor performs a review of the emergency plans for Southern Nuclear once each calendar year. The review includes a comparison for consistency of all emergency plans for the specific sites including the Security Plan, State, County, and the Savannah River Site plan, as appropriate.

The Emergency plans and EPIPs are revised in accordance with applicable site procedures.

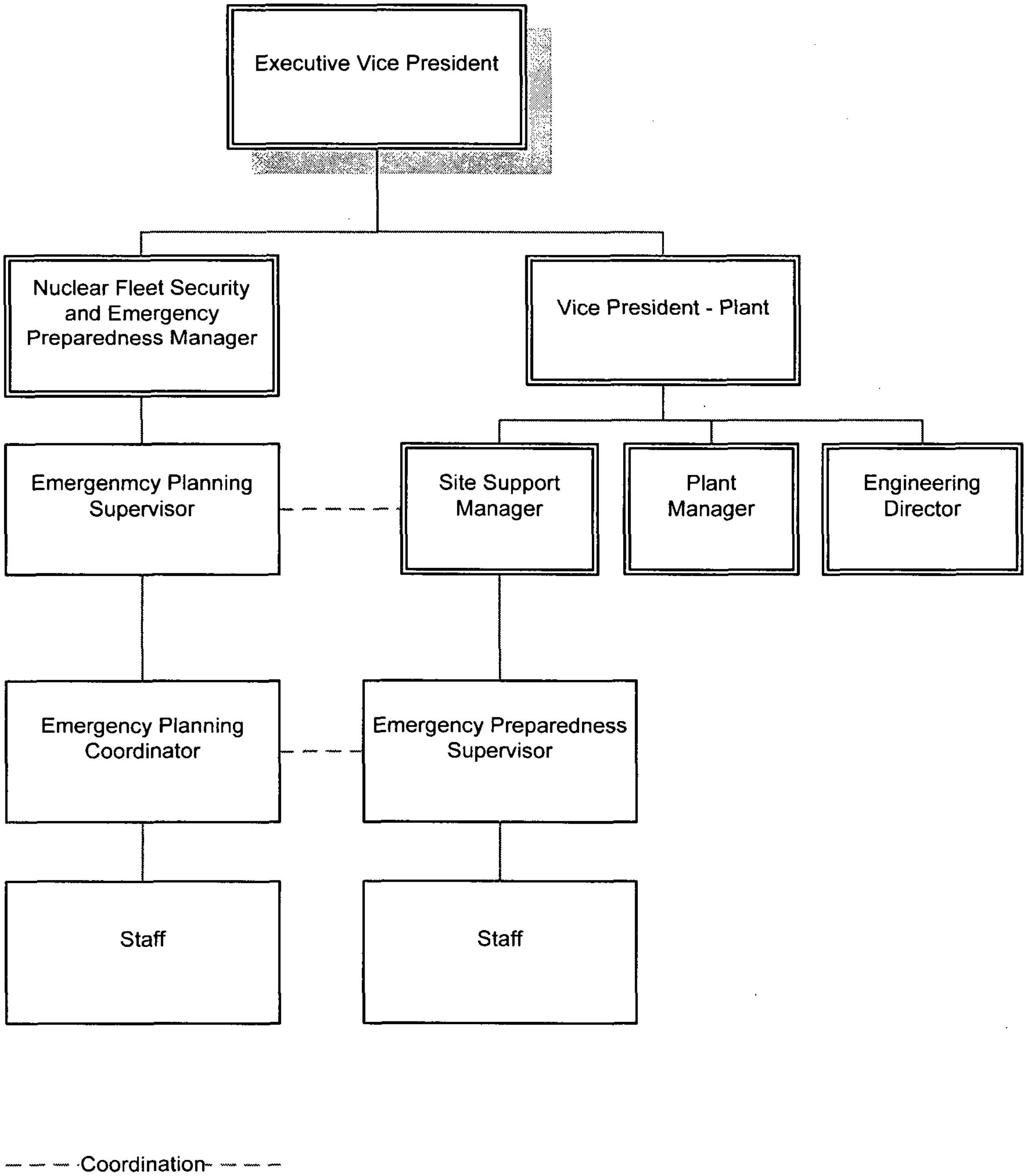
Emergency Plan changes which are judged to reduce the effectiveness of the Plan will be submitted to the NRC for approval prior to implementation. The Emergency Planning Coordinator will review Emergency Plan changes to determine if the effectiveness of the site specific plan has been reduced prior to submitting the proposed change for departmental review and subsequently to the PRB for approval.

As required by 10CFR50.54(t). An annual independent audit of the emergency preparedness program is conducted by the SNC Quality Assurance (QA) Department. This audit is conducted as part of the standard audit program and will include a review of the Emergency Plan, its implementing procedures and practices, emergency preparedness training, annual exercises, equipment, and emergency response facilities. In addition, an audit of the interfaces with offsite agencies is performed by the Corporate SNC Quality Assurance group.

Audits are performed in accordance with SNC QA department procedures. Audit reports are written and distributed to management and, in addition, applicable portions of the corporate audit reports are made available to affected Federal, State, and local agencies, as appropriate, in accordance with 10CFR50.54(t).

Appropriate departments are responsible for implementing corrective actions resulting from the audit findings. Records of these audits and exercise findings are maintained in accordance with plant procedures.

In addition to this Plan, several other formal emergency plans have been developed to support the overall emergency response effort. These supporting plans and their sources are listed in procedure NMP-EP-300, SNC Corporate Emergency Planning Activities.



Emergency Preparedness Organization
Figure I

APPENDIX 10(J)

EMERGENCY COMMUNICATIONS PLAN

EMERGENCY COMMUNICATIONS PLAN
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1.0 PURPOSE

The Southern Nuclear Emergency Communications Plan (ECP) is a portion of the Farley Nuclear Plant (FNP) site Emergency Plan submitted to the Nuclear Regulatory Commission (NRC). The SNC-ECP is reviewed and updated annually in conjunction with review and update of the site Emergency Plans.

The Vice President and General Counsel, SNC Corporate Council and Compliance, is responsible for coordination and administration of the Emergency Communications Plan (ECP or the Plan). The Plan will be reviewed and updated annually.

The ECP is designed to:

A. Coordinate the public communications effort through the issuance of timely, accurate information during an emergency and maintain an orderly flow of information during the recovery period.

B. Describe the means to activate and staff emergency communications positions in the Alabama Power/Georgia Power (APC/GPC) Corporate Media Center (CMC) in Birmingham/Atlanta, the Emergency News Centers (ENC), and the SNC Emergency Operations Facility (EOF).

C. Describe the process of information dissemination through news releases and press briefings.

D. Describe the training of personnel in their functions and testing of the response to be made pursuant to the ECP.

E. Maintain an orderly flow of information during the recovery period.

F. Describe the Public Education and Information Program for the periodic dissemination of emergency planning instructional materials to residents and transients in the plume exposure pathway Emergency Planning Zone.

G. Provide for 24-hour/day Emergency Communications Organization (ECO) staff coverage in the event of an emergency.

H. Describe the training and testing of personnel in their functions under the Plan.

I. Assign responsibilities to and duty locations for the Emergency Communications response team.

2.0 POLICY

The public information policy described below provides guidance for use during an emergency at a SNC nuclear plant (the Plant).

A. The Southern Company has a policy of full disclosure and will maintain honest and open communications with public officials, the public (especially in the immediate vicinity of the plant), and its employees at all times. This attitude stems from resolve to operate all facilities safely and prudently and to communicate clearly and completely any significant breach of safety.

B. The company will provide the public with prompt and accurate information through established news and information channels.

C. The company will make every effort to meet the information needs of the public and employees while communicating promptly with appropriate local, state, and federal officials during the period of the emergency.

D. Statements to the news media and the public concerning the Plant and its operation during any emergencies are to be made only with the knowledge and guidance of the appropriate GPC/APC Public Relations/Corporate Communication Departments and appropriate Southern Nuclear management.

3.0 RELATIONSHIP WITH OTHER AGENCIES

A. The Emergency Communications Organization (ECO) is responsible for the coordination and issuance of all news announcements related to emergency conditions at the Plant. Federal, state and county emergency management agencies are responsible for the issuance of public announcements relating to off-site conditions, including recommended protective actions.

B. An Emergency News Center (ENC) will be operated as a joint information center where the Utility, the state(s), the federal agencies (including the SRS as appropriate), and counties will coordinate information, issue news releases, make announcements, and may participate jointly in news briefings. Public response activities will be conducted and coordinated jointly with state and county agencies as appropriate. prior to ENC activation the Corporate Media Center (CMC) at APC/GPC Corporate Headquarters may coordinate these functions.

C. Work areas for public information officers of the federal, state, and county emergency response agencies are available at the ENC. Telecommunications facilities are also available to these agencies.

D. Utility news announcements will be provided to representatives of government agencies prior to their distribution to the news media or the public.

E. The county and state emergency management agencies should advise the Utility of announcements for the news media or the Emergency Alert Stations (EAS) prior to their distribution to the news media.

F. Public response may include state agency representatives and utility employees coordinated by the CMC/ENC Public Response Coordinator. Rumors related to off-site matters will be referred to the appropriate federal, state, or county agency representatives for proper response. Rumors related to on-site matters which agencies are aware of should be relayed to the CMC/ENC Public Response Coordinator for the necessary actions.

4.0 FLOW OF EMERGENCY PUBLIC INFORMATION

Information release for a Notification of Unusual Event is managed by the SNC Corporate Communication Manager in coordination with Southern Nuclear management and APC/GPC Corporate Communication.

At an Alert classification or higher, approval of news releases, other than the Initial News Release (INR), is required from both the EOF Manager and the Public Information Director (PID) or their designee(s).

The following figures are designed to show the flow of information for emergencies classified as Alert or higher.

A. Flow of Public Information During an Emergency

B. Initial/Early Stage Flow of Public Information for Corporate Media Center (Prior to ENC Activation)

C. Emergency Communications Information Flow (After ENC Activation)

D. Public Response

E. Emergency Communications Reporting Structure

5.0 EMERGENCY COMMUNICATIONS FACILITY LOCATIONS AND FUNCTIONS

The PI Director is responsible for all emergency communications response activities and staff.

At an alert classification or higher, the Emergency Communications public response will be handled initially from the CMC by the PI Director. The PI Director and the Nuclear Spokesperson will contact the EOF Manager for briefing on the emergency. The EOF will issue an Initial News Release (INR).

If the decision is made to activate the ENC, the PI Director and the Nuclear Spokesperson move to that facility. Upon activation of the ENC, primary utility Emergency Communications response will be conducted from the ENC. The CMC staff will maintain communications with the ENC and EOF, keep APC/GPC/SNC personnel notified of plant conditions, and support ENC activities.

A. Corporate Media Center – Atlanta/Birmingham

1. The Corporate Media Center, located at the Atlanta/Birmingham corporate headquarters building of Georgia Power Company/Alabama Power Company, as appropriate, is the official location for coordination and issuance of news announcements and responses to news media inquiries until the ENC has been activated. The CMC may function as a Joint Public Information Center (JPIC) and may conduct these activities as long as appropriate and necessary.

2. Prior to activation of the ENC at an Alert or higher classification, corporate staff assigned to the ENC will assemble at the CMC. They will proceed to the ENC when directed by the Public Information Director.

3. The following staff are assigned to the Corporate Media Center

   - PI Director (until ENC activation)
   - CMC Manager
   - CMC Media Relations Representative
   - CMC Facility Coordinator
   - CMC Public Response Coordinator
   - CNC Public Response Team
   - Government Relations Liaison
   - Financial Response Liaison
   - Employee Communications Coordinator

- Internet Coordinator
- CMC Assistant
- CMC Support Staff

4. Following activation of the ENC, the CMC staff responsibilities will continue. Responsibilities will include the following:

   a. Support of the ENC in all functions common to the two facilities such as telephone response, media monitoring, media response, news release reparation and distribution, etc.

   b. Functions specific to the CMC, including, but not limited to:
      - Employee communications
      - Financial response
      - Governmental response
      - Coordination with senior management
      - Internet activities
      - Providing additional trained staff to support the ECO effort

B. Emergency Operations Center (EOF)

1. The EOF will serve as the source of information about an incident to staff in the CMC and ENC.

2. Emergency Communications staff will:
   - Serve as the source of information for the Nuclear Spokesperson and PID
   - Develop and issue the INR
   - Develop and obtain nuclear approval for subsequent news releases
   - Confirm or correct rumors identified
   - Perform other communications responsibilities as needed

¶ C. Emergency News Center

1. After the initial notification of an emergency at the Alert classification or higher, the PI Director decides whether to activate the ENC. Once the ENC is activated, it becomes the "single source" for media information.

2. Upon activation of the ENC, the PI Director transfers to that facility, maintaining overall responsibility for emergency communications response. The PI Director will manage the emergency communications response and is responsible for all functions of the ENC. These functions include:

   - Final approval and distribution of press statements
   - Coordination of press briefings and joint news announcements with interface with the media and local officials
   - Requests for interviews and photos
   - Recorded information line updates
   - Public response

   It is the PI Director's responsibility to assure all information is fully coordinated with and among the appropriate state and federal government public information officers (PIOs).

3. Upon activation, the ENC will obtain information from the EOF.

4. News briefings will be held at regular intervals during the emergency. The PI Director will preside over the press briefings. The Nuclear Spokesperson will explain emergency conditions and actions the Utility has taken at the plant. Off-site issues will be handled by off-site agency representatives.

5. If radiological conditions permit, an area near the plant may be designated as a site for television and news photographs. The Media Relations Representative, in consultation with the PI Director and the ED or his designee, and AEMA/GEMA management, as appropriate, will arrange for escorted visits to photographic locations.

6. The following positions will be assigned to the Emergency News Center:

- PI Director
- ENC Manager
- Nuclear Spokesperson
- ENC Media Relations Representative
- ENC Public Response Coordinator
- ENC Public Response Team
- ENC Facility Coordinator
- ENC Assistant
- Community Relations Coordinator
- Admin Staff
- Technical Assistants
- Security Officers
- AV Support Staff

NOTE: The ENC is sometimes referred to as the "Joint Media Center", "Joint Public Information Center", or the "Joint Information Center" in off-site agency emergency plans. All titles refer to the same facility.

6.0 EMERGENCY COMMUNICATIONS PLAN ACTIVATION

A. Notification of Unusual Event (NOUE)

The SNC Corporate Communication Manager will be notified of an NOUE and will in turn notify APC Public Relations/GPC Corporate Communication management, as appropriate. The notification will include the status of the emergency and a brief description of the event. The SNC Corporate Communication Manager will confer with appropriate SNC management and affected owner-company management to determine the need for:

1. Additional notifications
2. Issuance of a news release

B. Alert and Higher Classifications

The SNC On-Call Media Rep will be advised of an event classified as Alert level or higher. The SNC rep will notify the APC/GPC On-Call Media Rep, as appropriate, with a description of the situation. The APC/GPC on-call media rep will notify the PID who will:

1. Formally activate the Emergency Communications Plan.

2. Notify emergency communications staff per Nuclear Management Procedure-Emergency Planning (NMP-EP-002).

3. Establish contact with the Emergency Operation Facility.

4. Establish contact with appropriate local, state and federal agencies.

5. Issue news release(s).

In addition, the PI Director will evaluate the following actions:

1. Activating the ENC and dispatch staff accordingly.

2. Conducting news briefings at the CMC or the ENC, which will include to the maximum extent possible, a panel composed of the Nuclear Spokesperson and representatives of government agencies.

7.0 EMERGENCY COMMUNICATIONS STAFF FUNCTIONS

The following is a description of responsibilities of principal Emergency Communications staff.

A. Public Information Director (PID):

The Public Information Director (PID) is responsible for directing all emergency communications personnel assignments. The PID, or a designee, is responsible for coordinating approvals and dissemination of all utility public information regarding the emergency. Upon activation of the CMC/ENC, the PID will be responsible for overall facility direction. Those duties may include coordinating approval and dissemination of utility news releases, facilitating news briefings, overseeing public response, meeting special media requests, and coordination among company and non-utility representatives in the facility and liaison with the media. The PID will be responsible for coordinating emergency communications response and coordinating with the SNC Corporate Duty Manager in evaluating the emergency's severity in terms of public interest and safety.

B. Nuclear Spokesperson

The Nuclear Spokesperson speaks on behalf of the company, providing plant status updates during news briefings. The Spokesperson also may do one-on-one media interviews. The position works with the Technical Assistant in keeping abreast of the event status and keeps the PID posted on that status. The position may first report to the EOF and then proceed to the CMC/ENC.

C. Technical Assistant (TA)

The Technical Assistant (TA) supports the Nuclear Spokesperson by gathering accurate and timely information about the event and the plant's status. Information is gathered via WebEOC, the plant status loop, and via direct contact with the EOC Manager – which the TA should maintain throughout an event. TA's may do media interviews at the discretion and direction of the PID.

D. CMC Manager

The CMC Manager will report to the CMC where he/she will coordinate activities. The CMC Manager may assume the PID role while a PID is en-route to the ENC. After ENC activation, the CMC Manager will assume full responsibility for CMC activities and maintain contact with the PID. The CMC Manager has responsibility for ensuring that the actions of the CMC positions are carried out.

E. CMC/ENC Public Response Coordinator

The CMC/ENC Public Response Coordinator will direct facility public response activities, keeping staff advised of current information and obtaining responses for questions they cannot answer. This includes referring specific inquiries to the proper person. The Coordinator is responsible for tracking rumors and ensuring that the Public Response team members have updated information on the rumor responses.

F. CMC Financial Response Liaison

The CMC Financial Response Liaison responds to financial inquiries from financial analysts, the public, media and stockholders regarding the effects a nuclear incident might have on Southern Company's financial position. This role identifies and establishes contact with key financial leaders and provides them updated information. The position maintains contact with the CMC Public Response Coordinator.

G. Government Relations Liaison

The Government Relations Liaison responds to inquiries from governmental sources. The role identifies and establishes contact with key government officials and provides them with updated information. The position maintains contact with the CMC Public Response Coordinator.

H. SNC News Writer
The SNC News Writer gathers information and prepares all news releases for the duration of an event. The News Writer coordinates technical approval with the SNC EOF Manager. This position works in the SNC EOF.

I. ENC Manager

The ENC Manager is responsible for coordinating operations of the facility and has responsibility for ensuring that the actions of the ENC positions represented on Attachment 1 are carried out. The position may assume Emergency Communications approval authority at the direction of the PID.

J. CMC/ENC Media Relations Representative(s)

The CMC/ENC Media Relations Representative(s) report to the CMC/ENC Manager and are responsible for implementing utility media response.

K. CMC/ENC Facility Coordinator

The CMC/ENC Facility Coordinator is responsible for setting up the facility and ensuring ongoing operability. The position supports the CMC/ENC Manager

L. Community Relations Coordinator

The Community Relations Coordinator identifies and initiates contacts with local public officials and leaders who need to be aware of the latest information about events. The position should advise the Public Response Coordinator and Governmental Relations Liaison of activities and contacts as appropriate

M. CMC/ENC Assistant

The CMC/ENC Assistant supports the PID and staff, coordinates approval and distribution of news releases, directs activities of the support staff and maintains an accurate record of ENC activities

N. CMC/ENC Support Staff

The CMC/ENC Support Staff provides administrative support for the facility.

O. Employee Communications Coordinator

The Employee Communications Coordinator disseminates plant status updates to Southern Company employees and customer service centers through a variety of means.

P. Internet Coordinator

The Internet Coordinator is responsible for updating and maintaining the company's external emergency page and monitoring the web for external coverage of the event.

Q. CMC/ENC Public Response Team

The CMC/ENC Public Response Team is responsible for responding to public inquiries. The team may include Telephone Responders, Media Monitor, Internet Coordinator, Employee Communications Coordinator, Financial Response Liaison and Governmental Relations Liaison.

8.0 NEWS RELEASES

The Utility will issue news releases concerning events, conditions and actions at the Plant. News releases are designed to be a written confirmation of events and public information which has been issued.

The SNC News Writer will write news releases in the EOF and obtain nuclear approval from the EOF Manager, then forward them to the CMC or ENC as appropriate. The Facility Manager at that location will obtain communications approval and direct distribution of the release.

9.0 PRESS BRIEFINGS

In the event of an incident at a nuclear plant media attention would be quick and overwhelming. Press briefings will be conducted to keep the media informed of events and activities relating to the emergency. Briefings will provide the most current, up-to-date information about events and response to the incident. They are also a primary means of addressing rumors or inaccurate information identified in our publics.

Public Information Officers (PIOs) from all offsite agencies responding to the emergency will be encouraged to participate in the briefings to discuss their particular activities.

The emphasis of the briefings will be on public safety

10.0 PUBLIC RESPONSE

Upon announcement of an emergency situation, misinformation and rumors can be expected to evolve. The following Public Response policies shall be instituted and followed upon the activation of the ECP.

Rumors will be addressed through a policy of open and candid communications with the news media and general public.

A. All appropriate information will be released as clearly, concisely and quickly as possible. Public announcements will be made on a frequent and regular basis.

B. An official Utility spokesperson will be designated as the source of new or updated official information about the incident.

C. Public response will encompass a number of activities to ensure accurate information is disseminated. These may include:

- Recorded messages containing the most current information,
- Interaction with callers,
- Proactively providing information to the media and responding to their needs,
- Monitoring media broadcasts/outlets
- Employee communications
- Identifying, notifying and constantly updating specific publics, (i.e. financial centers, governmental Officials, etc.)
- Internet coordination

Public response activities will be coordinated with state agencies. The Prompt Notification System (PNS) will be activated by state or local EMA officials. PNS will direct area residents to local news broadcasts and/or the Emergency Alert System (EAS), which will serve as the primary source of official information for the public.

11.0 TELECOMMUNICATIONS

A. The CMC/ENC Facility Coordinator will be responsible for resolving problems and obtaining additional equipment needed for the facility.

B. Lines will be made available to the extent possible for off-site agency staff who bring fax machines, computers, and other equipment.

C. Telephone lines and equipment discussed above will be tested quarterly.

12.0 TRANSPORTATION

A. If directed, the CMC Assistant will arrange for ground transportation services for Emergency Communication Organization staff relocating to the ENC.

B. Special transportation arrangements, such as helicopter service between Birmingham, Atlanta, the affected plant and the ENC, may be made available in an emergency.

13.0 SECURITY

A. APC/GPC corporate security will coordinate 24-hour security support at the CMC during an emergency.

B. At GPC ENCs, GPC corporate security will coordinate security coverage. At Plant Vogtle, local law enforcement may supplement coverage until regular uniform coverage is available or as needed. At Plant Farley, Houston County EMA will arrange for staffing by Houston County Sheriff's Dept.

C. Company personnel, news personnel, industry representatives, government officials, and visitors will be asked to present identification and will be given an identification badge for admittance to the facility. This ID badge should be visible at all times.

14.0 PRINT AND AUDIOVISUAL AIDS

A. Press kits are stored at the ENCs and at the CMCs. These kits will be updated regularly and will be available to all news media.

B. An emergency web page will be activated and will replace the normal web page on the operating company's Internet site in the event of an incident. The emergency page includes plant schematics, background information and directions to the ENC. News releases about the event will also be available here.

C. Maps, photographs, and schematics of the plant are stored at the CMCs and ENCs for use during news briefings.

D. Videotape cassettes of plant exterior and interior views will be maintained and made available for distribution upon request to television stations.

15.0 SPECIAL REQUESTS

A. A Media Relations Representative will respond to requests for special interviews, films, photos, videotapes, etc.

B. Special requests may be refused either for safety or security reasons. In such cases, the reason for refusal will be clearly explained.

C. ENC staff personnel will accommodate photographers at the plant site as conditions warrant. Media escorts will be coordinated with AEMA/GEMA.

D. A Media Relations Representative or his designee will be present at all special interviews. Briefings and special interviews should be videotaped.

E. Industry experts from appropriate agencies (e.g. NEI, INPO) may be called upon to provide general background information to reporters but will not comment on the Plant's status. With knowledge of the PI Director, interviews with these individual will be arranged by the Media Relations Representative.

16.0 PUBLIC INFORMATION PLAN FOR RECOVERY

A. The lead emergency communications representative in the Recovery Organization will be the PI Director. This person, or his designee, will maintain close contact with the Recovery Manager. Emergency communications response will follow the guidelines and procedures described for accident response.

B. As conditions and public interest warrant, additional emergency communications personnel will be assigned to support information dissemination concerning recovery operations.

C. Information for possible release will be cleared with the Recovery manager and the PI Director and given to the media through established procedures.

D. All information will be released through established channels of communication to federal and state authorities, the utility industry, the public, and employees.

E. Advance notice will be given to the public through the media of any Utility action that will or may affect the health and safety of the plume exposure pathway EPZ residents. Information will be followed up with a news release as soon as possible.

17.0 TRAINING

A. Emergency Communications Staff Training

The APC/GPC Emergency Communications Coordinator will coordinate training for applicable emergency communications personnel once per calendar year. Training will provide an overview of the Emergency Communications Plan and specific staff position responsibilities. (See Table 1)

Individuals assigned key positions on the Emergency Communications staff will participate in training. GPC responders with duties directly related to their daily jobs may be exempted from review. Training documentation and records will be held at APC/GPC by the Emergency Communications Coordinator.

Evaluation of individual and team performance during exercises will also be used to measure training program effectiveness and to adjust course content.

B. News Media Training

A program will be offered each calendar year to acquaint the news media with the process for obtaining information during an emergency and with overall emergency preparedness at APC/GPC nuclear plants, as appropriate. The training will include information about the plant, radiation, and the role of the ENC.

Media participation as observers or "reporter players" during exercises can effectively enhance training. Media may be invited to participate in annual exercises.

18.0 PUBLIC INFORMATION AND EDUCATION PROGRAM

The goal of the public information program is to acquaint the general public with the emergency plans for the operation of APC/GPC nuclear plants, as appropriate, and actions the general public should take if a radiological emergency occurs. Such a program is essential to the overall welfare of area citizens. Any incident involving a nuclear plant or nuclear materials can easily become a "crisis" in the minds of those living in the area, unless they understand the plans and programs in place to respond should an emergency occur.

Only by keeping the public well informed will the Plants be able to operate for the maximum benefit of all concerned. The Public Education and Information Program will seek to:

- Explain to the public how they will be notified should an emergency occur at the plant. This will include instructions in the use of the Tone Alert Radio notification system and information on the siren notification system as appropriate.

- Educate the public about radiation and contamination.

- Help the public understand what their initial actions should be in an emergency.

- Familiarize the public with protective actions, e.g. evacuation routes and relocation centers, and sheltering which may be required and rationale behind recommendations for these actions.

- Provide information concerning methods for receiving additional information

- Ensure that special needs of the handicapped are understood

A. In order to help assure proper public reaction to an emergency notification, Alabama Power, Georgia Power and Southern Nuclear will keep state and local officials continuously informed of all details related to any emergency.

B. Several communications methods may be used to acquaint the public with plans for their protection during a Plant emergency. Means for accomplishing these methods will include one or more of the following activities as listed below. Effort will be concentrated upon providing information to the public by written material that is likely to be available in the residence and in locations frequented by transients. The information will also provide instructions as to what local media (radio and television stations) will be providing additional information in the event of an emergency.

    1. Placement of an advertisement in local telephone directories.

    2. Information in utility bills,

3. Signs displayed in public areas within the plume exposure EPZ. (e.g., commercial establishments, areas used by sportsmen, motels, gasoline stations, phone booths, etc.) Sign content and location distribution will be revised and redistributed as needed.

4. Distribution of an emergency information publications/leaflets,

5. Television or Radio,

6. Emergency Calendars,

7. Direct Mail-Newsletters,

8. Visitor Center availability to the public (when not restricted for Security reasons),

9. Information exchange meetings with government agencies and local officials as needed.

19.0 PROCEDURES

Implementing procedures (listed below) exist which will provide guidance and direction for carrying out the activities and responsibilities listed in this Plan. These procedures cover, but are not limited to, emergency communications staffing, activation of emergency communication facilities, development and issue of news releases, conduct of news briefings/media response, public response and public education/information dissemination.

- NMP-EP-201 Corporate Emergency Communications Administration
- NMP-EP-202 Emergency Communications Notification and Activation
- NMP-EP-203 Corporate Media Center Operation
- NMP-EP-204 Emergency News Center Operation
- NMP-EP-205 Emergency Response News Releases
- NMP-EP-206 Corporate Communications News Briefings

Emergency Response Organization Position	Training Subject Areas			
	Emergency	Media Training	Position	Spokesperson
Public Information Director	X		X	
CMC Manager	X		X	
ENC Manager	X		X	
Nuclear Spokesperson	X		X	X
CMC/ENC Media Relations Representative	X		X	
SNC News Writer	X		X	
Employee Communications Coordinator	X		X	
Public Response Teams	X		X	
CMC/ENC Public Response Coordinator	X		X	
Community Relations Coordinator	X		X	
CMC/ENC Assistant	X		X	
CMC/ENC Support Staff	X		X	
CMC/ENC Facility Coordinator	X		X	
Internet Coordinator	X		X	
News Media		X		

EMERGENCY COMMUNICATION ORGANIZATION TRAINING MATRIX

TABLE 1

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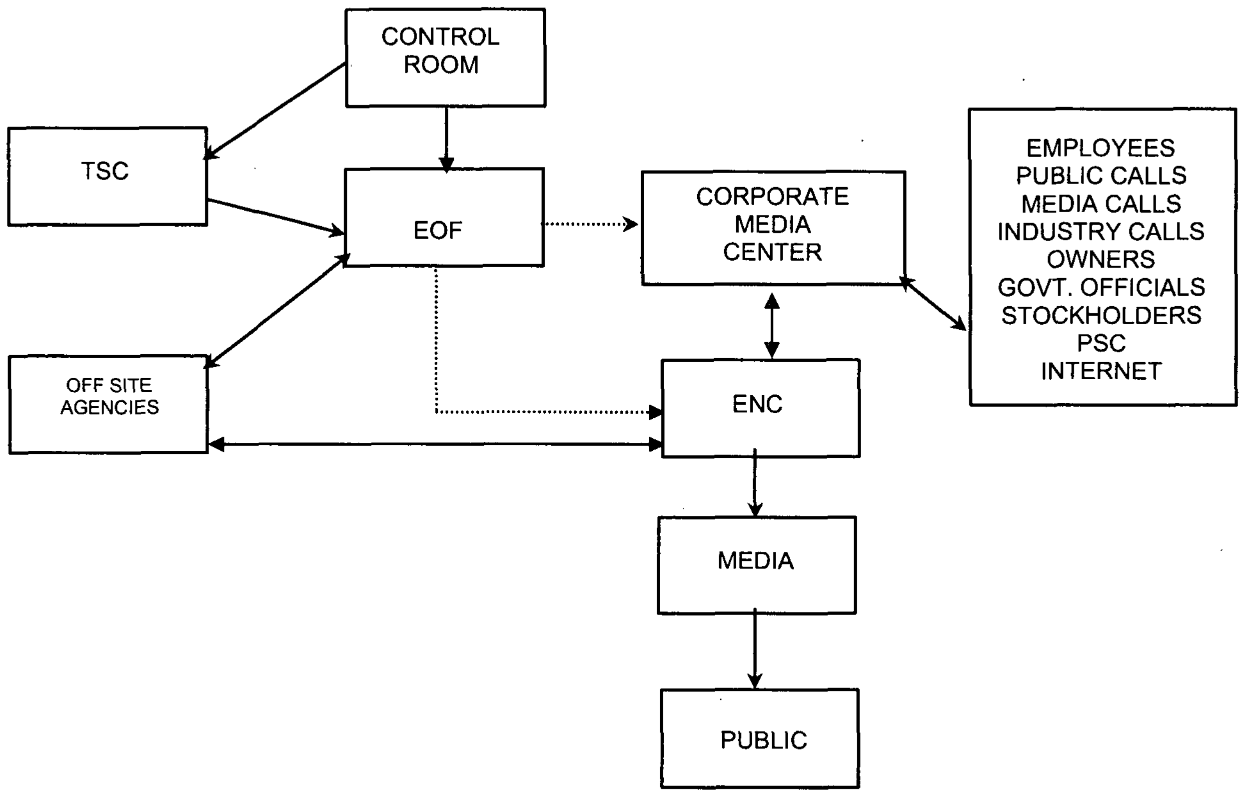
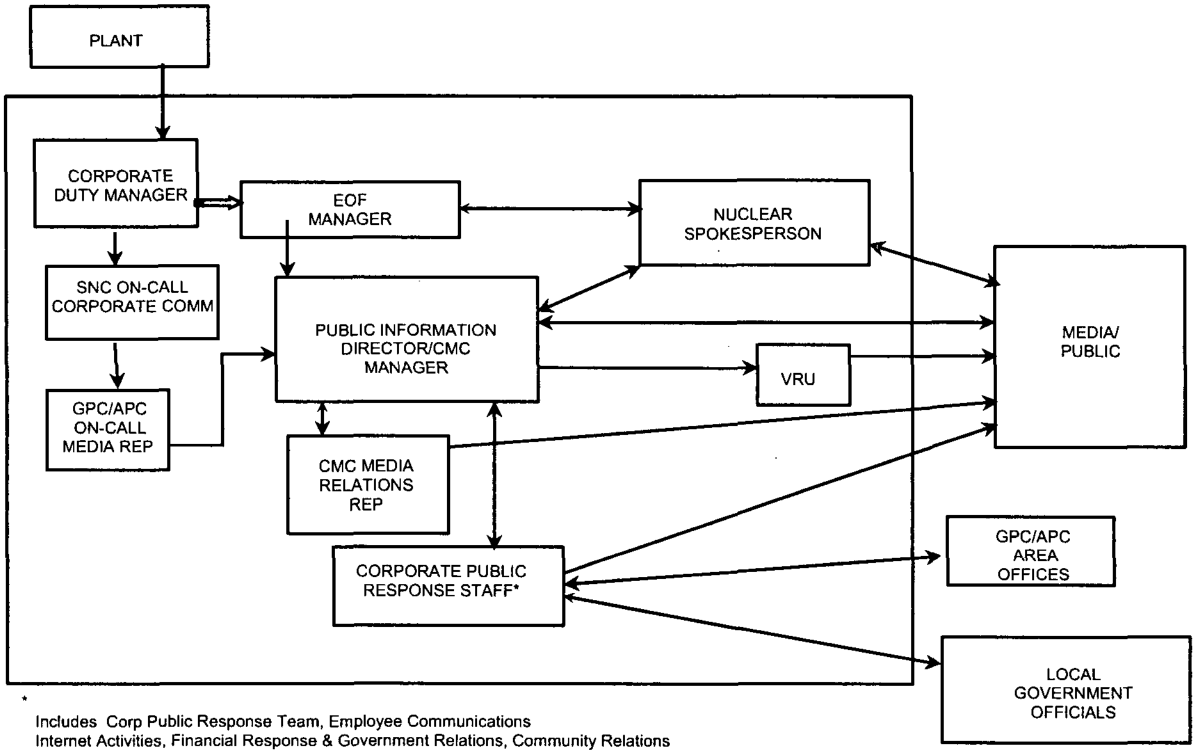


FLOW OF PUBLIC INFORMATION DURING AN EMERGENCY

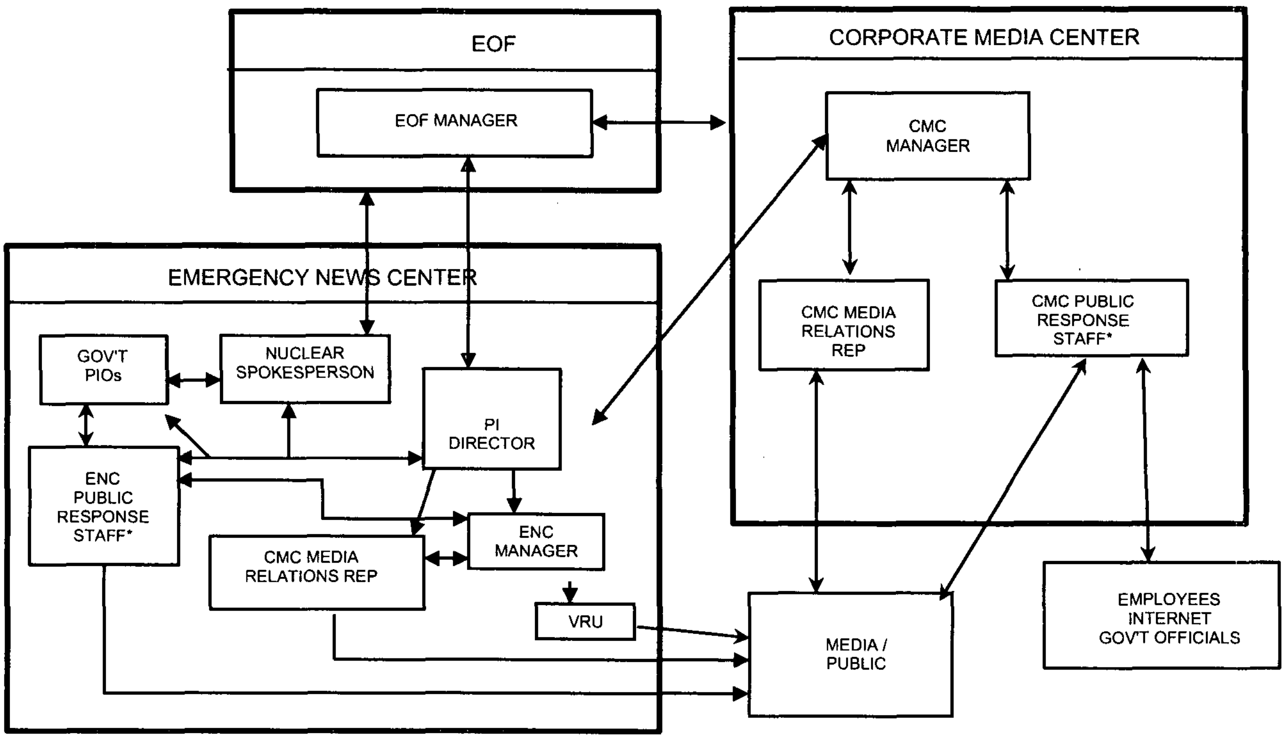
Figure A



* Includes Corp Public Response Team, Employee Communications
Internet Activities, Financial Response & Government Relations, Community Relations

INITIAL/ EARLY FLOW OF EMERGENCY PUBLIC INFORMATION AT CORPORATE MEDIA CENTER (PRIOR TO ENC ACTIVATION)

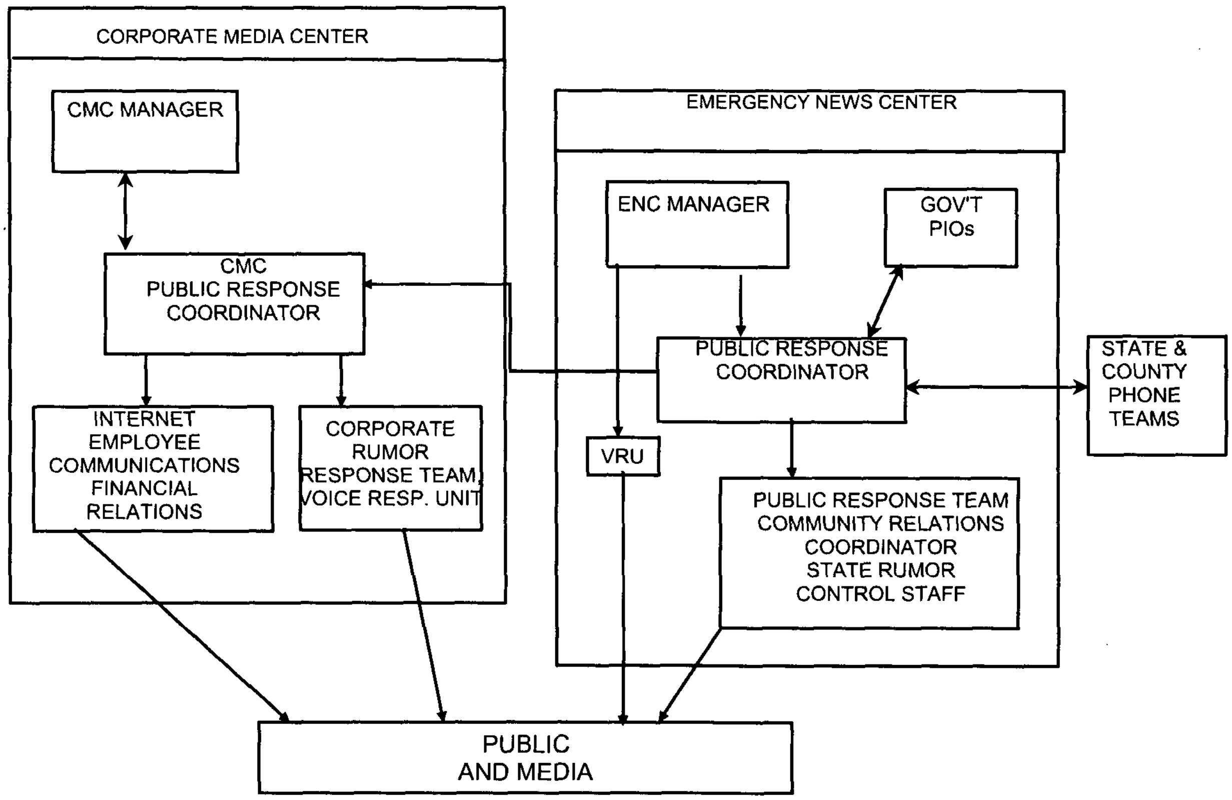
Figure B



*INCLUDES TELEPHONE RESPONSE TEAMS, COMMUNITY RELATIONS COORD., STATE RESPONSE TEAMS

EMERGENCY COMMUNICATIONS INFORMATION FLOW AFTER ENC ACTIVATION

Figure C



PUBLIC RESPONSE FLOW CHART

Figure D

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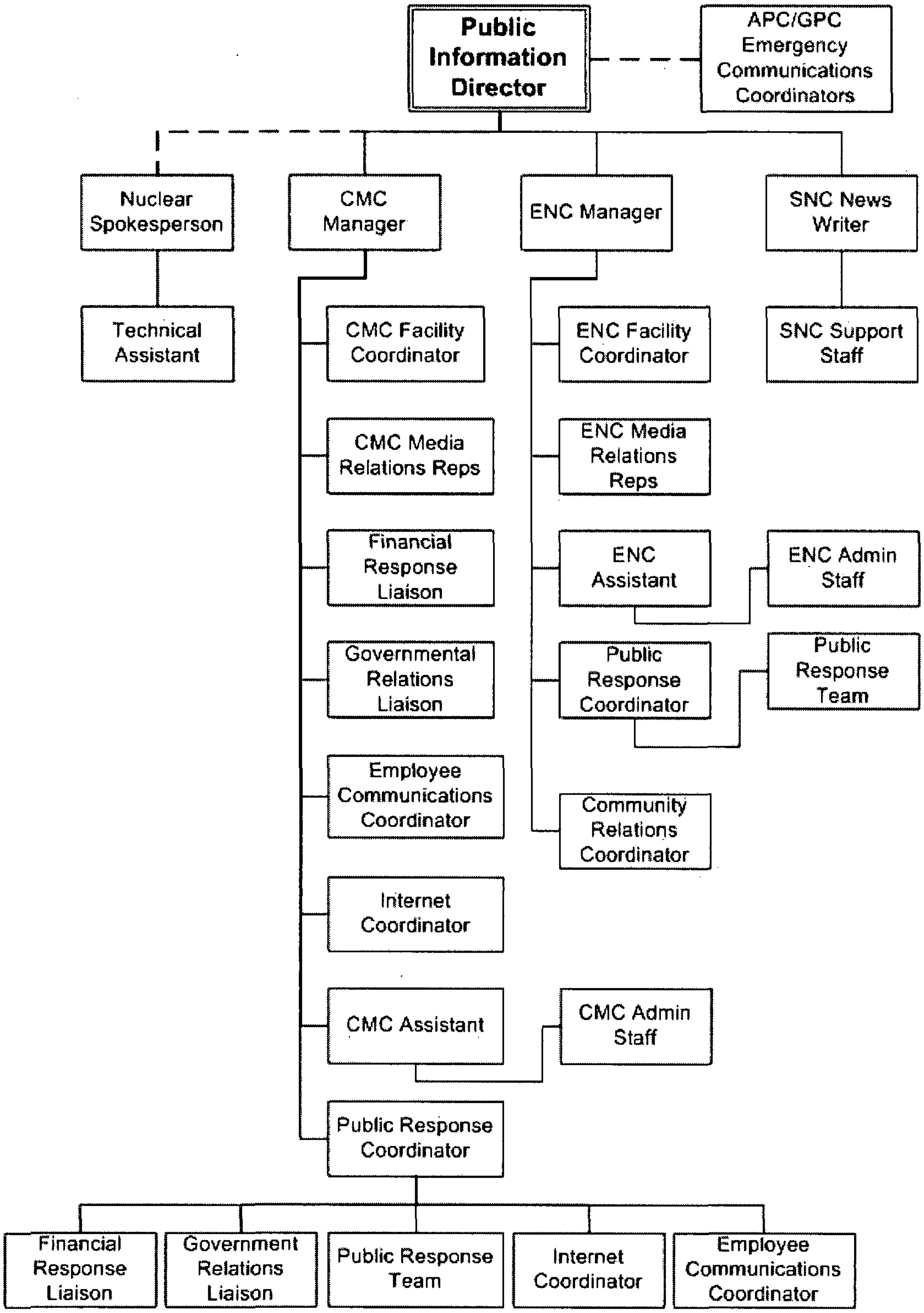

EMERGENCY COMMNICATIONS REPORTING STRUCTURE

FIGURE E

APPENDIX 11(K)

ASSESSMENT ACTIONS

ASSESSMENT ACTIONS

1. CLASSIFICATION OF EMERGENCIES

The classification system is based on the four emergency classes described in 10CFR50 Appendix E and NUREG 0654, established by the Nuclear Regulatory Commission (NRC), for grouping off-normal nuclear power plant conditions according to (1) their relative radiological seriousness, and (2) the time-sensitive onsite and off-site radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classes, in ascending order of seriousness, are called:

- Notification of Unusual Event (NUE)
- Alert
- Site Area Emergency (SAE)
- General Emergency (GE)

The classes, therefore, determine initial steps to be taken by on site and by corporate emergency response personnel. The emergency classes are used by offsite authorities to determine which of the preplanned actions to be taken by their emergency organizations.

An emergency classification is indicative of the status of the plant. Inputs to the emergency classification system include the status of various plant systems, radiation levels in and around plant areas, and the rate of release of radioactivity from the plant. These are termed Initiating Conditions which are a predetermined subset of nuclear power plant conditions where either the potential exists for a radiological emergency, or such an emergency has occurred.

The SNC classification scheme is based on NEI 99-01, Rev 4, Methodology for Development of Emergency Action Levels, January 2003 endorsed by Reg Guide 1.101, Rev 4, Emergency Planning and Preparedness for Nuclear Power Reactors. The Initiating Conditions lead each plant to a classification Implementing Procedure which contains the Threshold values for each Initiating Condition.

Each Initiating Condition has specific conditions associated that are termed Threshold Values. When an Initiating Condition is observed and the criteria of it's associated Threshold Values are met, an Emergency Action Level is met and the event is then classified and declared at the appropriate level.

The SNC Classification procedures are written to classify events based on meeting the Initiating Condition (IC) and a Threshold Value (TV) for an EAL considering each Unit independently. During events, the ICs and TVs are monitored and if conditions meet another higher EAL, that higher emergency classification is declared and appropriate notifications made. Notifications are made on a site basis. If both units are in concurrent classifications, the highest classification would be used for the notification and the other unit classification noted on the notification form.

At all times, when conditions present themselves that are not explicitly provided in the EAL scheme the Emergency Director has discretion to declare an event based on his knowledge of the emergency classes and judgment of the situation or condition.

Once an emergency classification is made, it cannot be downgraded to a lower classification. All the actions associated with the emergency classification level must be completed and then a termination of the event can be affected. At termination, on an event specific basis, the site can either enter normal operating conditions or enter a recovery condition with a recovery organization established for turnover from the ERO.

The described emergency classes and the emergency action levels which determine them are agreed on by SNC and State and local authorities. The emergency action levels will be reviewed by these officials annually.

a. Notification of Unusual Event

1. Description

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

2. Response

In the event of a Notification of Unusual Event, the Shift Manager will assesses the conditions and implement the Classification EIP.

The Emergency Organization will perform the following:

1) Inform State and local offsite authorities of the nature of the unusual event within 15 min. of classifying the emergency. Notify the Nuclear Regulatory Commission (NRC) as soon as possible (ASAP) but no later than 1 hour following classification of the emergency.

2) Augment on-shift resources, as needed.

3) Assess and respond to the event.

4) Escalate to a more severe class, if appropriate, or close out with a verbal summary to offsite authorities followed by a written summary within 24 hours.

b. Alert

1. Description

The classification of Alert applies to situations in which events are in process or have occurred which involve an, actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of hostile action. Any releases of radioactive material for the Alert classification are expected to be limited to small fractions of the U.S. Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels. The purpose of offsite alert is to assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required and to provide offsite authorities current status information.

2. Response

In the event of an Alert the Shift Manager will assess the conditions and implement the Classification EIP.
The Emergency Organization will then perform the following:

1) Within 15 min. of classification, inform State and local offsite authorities of Alert Emergency and reasons for emergency. Notify the NRC ASAP but no later than 1 hour following classification of the emergency.

2) Augment resources and activate the emergency response facilities (e.g. Technical Support Center (TSC), Operational Support Center (OSC) and the Emergency Operations Facility (EOF)). These actions may be delayed for security based events at the discretion of the emergency director.

3) Assess and respond to the emergency.

4) Mobilize, and dispatch if necessary, onsite survey teams.

5) Provide periodic plant status updates to offsite authorities.

6) Provide periodic meteorological assessments to offsite authorities and, if any emergency releases are occurring, field monitoring team readings or dose estimates for actual releases.

7) Activate the Emergency Response Data System for the affected unit within 1 hour following declaration of the Alert.

8) Escalate to a more severe class, if appropriate, or close out the emergency class by verbal summary to offsite authorities followed by written summary within 8 hours of closeout.

c. Site Area Emergency

1. Description

The classification of Site Area Emergency applies to those events which are in progress or have occurred that involve actual or likely major failures of plant functions needed for protection of the public from radiation or contamination or security events that result in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevent effective access to, equipment needed for the protection of the public. Any releases of radioactive material for the Site Area Emergency classification are not expected to exceed EPA Protective Action Guideline exposure levels except near the site boundary.

2. Response

In the event of a Site Area Emergency, the Shift Manager will assess the conditions and implement the Classification EIP.

The Emergency Organization will perform the following:

1) Within 15 min. of classification, inform State and local offsite authorities of Site Area Emergency and reasons for emergency. Notify the NRC ASAP but no later than 1 hour following classification of the emergency.

2) If necessary, provide protective action recommendations to State and local authorities.

3) Augment resources and activate the emergency response facilities (e.g. Technical Support Center (TSC), Operational Support Center (OSC), and the Emergency Operating Facility (EOF)). These actions may be delayed for security based events at the discretion of the emergency director.

4) Assess and respond to the emergency.

5) Dispatch as necessary onsite and offsite survey teams.

6) Dedicate individuals for plant status updates to offsite authorities and periodic press briefings.

7) On a periodic basis, make senior technical and management staff available for consultation with the NRC and State officials.

8) Provide meteorological information and dose estimates to offsite authorities for actual releases via a dedicated individual.

8) Provide release and dose projections based on available plant condition information and foreseeable contingencies.

10) Activate the Emergency Response Data System for the affected unit within 1 hour following declaration of the Site Area Emergency.

11) Escalate to General Emergency, if appropriate, or close out the emergency class by briefing of offsite authorities followed by written summary within 8 hours of closeout.

d. General Emergency

1. Description

The classification of General Emergency applies to those events which are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential loss of containment integrity or security events that result in an actual loss of physical control of the facility. Release of radioactive material for the General Emergency classification can reasonably be expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

2. Response

In the event of a General Emergency the Shift Manager will assess the conditions and implement the Classification EIP.

The Emergency Organization will then perform the following:

1) Within 15 min. of classification, inform State and local offsite authorities of General Emergency and reason for emergency. Notify the NRC ASAP but no later than 1 hour following classification of the emergency.

2) Provide protective action recommendations to State and local authorities based upon plant conditions and/or actual or projected releases of radioactive material.

3) Augment resources and activate the emergency response facilities (e.g. Technical Support Center (TSC), Operational Support Center (OSC), and the Emergency Operating Facility (EOF)). These actions may be delayed for security based events at the discretion of the emergency director.

4) Assess and respond to the emergency

5) Dispatch onsite and offsite survey teams.

6) Dedicate an individual for plant status updates to offsite authorities and periodic press briefings.

7) On a periodic basis, make senior technical and management staff available for consultation with the NRC and State officials..

8) Provide meteorological data and field monitoring team readings or dose estimates to offsite authorities for actual releases.

9) Provide release and dose projections based on plant condition and foreseeable contingencies.

10) Activate the Emergency Response Data System for the affected unit within 1 hour following declaration of the General Emergency.

11) Close out the emergency class by briefing of offsite authorities followed by written summary within 8 hours of closeout.

2. CLASSIFICATION PROCESS

The Classification Emergency Plan Implementing Procedure is used to classify the emergency condition upon recognition of an off- normal condition relative to an Initiating Condition.

Two Initiating Condition Matrices and a Fission Product Barrier Evaluation table are used depending on the initial mode of the unit. The Hot Initiating Condition matrix and the Fission Product Barrier Evaluation table are used when the unit is in the Technical Specification defined modes of Hot Shutdown, Hot Standby , Startup and Power Operation. A Cold Initiating Condition matrix is used when the unit is in the Cold Shutdown, Refueling, or Defueled modes. The IC Matrices are human factored to read from top to bottom General Emergency to Notification of Unusual Event within a category or subcategory.

To facilitate the expeditious classification of emergencies, the various initiating conditions which may result in an emergency class are grouped into six recognition categories as follows:

- Radiological (Hot and Cold – R series)
- Fission Product Barriers (Hot – F series)
- System Malfunctions (Hot – S series)
- System Malfunctions (Cold – C series)
- ISFSI (Hot and Cold – E series)
- Hazards (Hot and Cold – H series)

Within each category, sub categories and specific Initiating Conditions are identified. Each Initiating Condition has specific conditions associated that are termed Threshold Values. These Initiating Conditions, Threshold Values, and bases are provided in this Appendix.

Hot Initiating Condition Matrix – Modes 1, 2, 3 and 4

Categories / Subcategories

	Radiological		Fission Product Barriers	System Malfunctions					Hazards					
	Release	**Rad Levels**		**AC/DC Power**	**Rx and Core**	**Annunciators**	**RCS**	**Communications**	**Natural/ Destructive**	**Fire/ Explosion**	**Toxic / Flammable**	**Security**	**CR Evacuation**	**ED Discretion**
General Emergency	RG1- Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mR TEDE OR 5000 mR Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.		FG1 - Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier	SG1 - Prolonged Loss of All Offsite Power AND Prolonged Loss of All Onsite AC Power	SG2 - Failure of the Reactor Protection System to Complete an Automatic Trip and Manual Trip was NOT Successful AND there is Indication of an Extreme Challenge to the Ability to Cool the Core.				ISFSI			HG1 - HOSTILE ACTION Resulting in Loss Of Physical Control of the Facility		HG2 - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency
Site Area Emergency	RS1 - Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR TEDE OR 500 mR Thyroid CDE for the Actual or Projected Duration of the Release.		FS1 - Loss or Potential Loss of ANY Two Barriers	SS1 - Loss of All Offsite Power AND Loss of All Onsite AC Power to Essential Busses SS3 - Loss of All Vital DC Power	SS2 - Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded AND Manual Trip Was NOT Successful. SS4 - Complete Loss of Heat Removal Capability	SS6 Inability to Monitor a SIGNIFICANT TRANSIENT in Progress						HS4 - HOSTILE ACTION within the PROTECTED AREA	HS2 - Control Room Evacuation Has Been Initiated AND Plant Control Cannot Be Established	HS3 - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency
Alert	RA1 - Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Radiological Effluent Technical Specifications for 15 Minutes or Longer.	RA2 - Damage to Irradiated Fuel OR Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel RA3 - Release of Radioactive Material or Rises in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown	FA1 - ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	SA5 - AC power capability to essential busses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in station blackout.	SA2 - Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded AND Manual Trip Was Successful.	SA4 - UNPLANNED Loss of Most or All Annunciation or Indication in the control room With EITHER a (1) a SIGNIFICANT TRANSIENT in Progress, OR (2) Compensatory Non-Alarming Indicators are Unavailable			HA1 - Natural and Destructive Phenomena Affecting the Plant VITAL AREA	HA2 - FIRE OR EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown	HA3 - Release of Toxic, Asphyxiant or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.	HA4 - HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat	HA5 - Control Room Evacuation Has Been Initiated	HA6 - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert
Notification of Unusual Event	RU1 - Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Effluent Technical Specifications for 60 Minutes or Longer.	RU2 - Unexpected Rise in Plant Radiation	FU1 - ANY Loss OR ANY Potential Loss of Containment	SU1 - Loss of All Offsite Power to Essential Busses for GREATER THAN 15 Minutes	SU2 - Inability to Reach Required Shutdown Within Technical Specification Limits SU4 - Fuel Clad Degradation SU8 - Inadvertent Criticality	SU3 - UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes	SU5 - RCS Leakage	SU6 - UNPLANNED Loss of All Onsite OR Offsite Communications Capabilities	HU1 - Natural and Destructive Phenomena Affecting the PROTECTED AREA E-HU1 - Damage to a loaded cask CONFINEMENT BOUNDARY	HU2 - FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection	HU3 - Release of Toxic, Asphyxiant, or Flammable Gases Deemed Detrimental to Normal Operation of the Plant	HU4 - Confirmed SECURITY CONDITION or threat Which Indicates a Potential Degradation in the Level of Safety of the Plant		HU5 - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a NOUE

Cold Initiating Condition Matrix – Modes 5, 6 and Defueled

Categories / Subcategories

	Radiological		System Malfunctions					Hazards					
	Release	**Rad levels**	**AC/DC Power**	**Rx and Core**	**Heat Removal**	**RCS**	**Communi-cations**	**Natural/ Destructive**	**Fire/ Explosion**	**Toxic / Flammable**	**Security**	**CR Evacuation**	**ED Discretion**
General Emergency	**RG1**- Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mR TEDE **OR** 5000 mR Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.			**CG1** - Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV.				**ISFSI**			**HG1** - HOSTILE ACTION Resulting in Loss Of Physical Control of the Facility		**HG2** - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency
Site Area Emergency	**RS1** - Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR TEDE **OR** 500 mR Thyroid CDE for the Actual or Projected Duration of the Release.			**CS2** - Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV. **Mode 6 only**		**CS1** - Loss of RPV Inventory Affecting Core Decay Heat Removal Capability. **Mode 5 only**					**HS4** – HOSTILE ACTION within the PROTECTED AREA	**HS2** - Control Room Evacuation Has Been Initiated **AND** Plant Control Cannot Be Established	**HS3** - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency
Alert	**RA1** - Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Radiological Effluent Technical Specifications for 15 Minutes or Longer.	**RA2** - Damage to Irradiated Fuel **OR** Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel **RA3** - Release of Radioactive Material or Rises in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown	**CA3** - Loss of All Offsite Power **AND** Loss of All Onsite AC Power to Essential Busses.	**CA2** - Loss of RPV Inventory with Irradiated Fuel in the RPV. **Mode 6 only**	**CA4** - Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV.	**CA1** - Loss of RCS Inventory. **Mode 5 only**		**HA1** - Natural and Destructive Phenomena Affecting the Plant VITAL AREA	**HA2** - FIRE **OR** EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown	**HA3** - Release of Toxic, Asphyxiant or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown	**HA4** - HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat.	**HA5** - Control Room Evacuation Has Been Initiated	**HA6** - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert
Notification of Unusual Event	**RU1** – Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Effluent Technical Specifications for 60 Minutes or Longer.	**RU2** – Unexpected Rise in Plant Radiation	**CU3** - Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes. **CU7** - Unplanned Loss of Required DC Power for Greater than 15 Minutes.	**CU8** - Inadvertent Criticality	**CU4** - Unplanned Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV.	**CU1** - RCS Leakage **Mode 5 only** **CU2** - Unplanned Loss of RCS Inventory with Irradiated Fuel in the RPV **Mode 6 only**	**CU6** - UNPLANNED Loss of All Onsite **OR** Offsite Communications Capabilities	**HU1** - Natural and Destructive Phenomena Affecting the PROTECTED AREA **E-HU1** – Damage to a loaded cask CONFINEMENT BOUNDARY	**HU2** - FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection	**HU3** - Release of Toxic, Asphyxiant, or Flammable Gases Deemed Detrimental to Normal Operation of the Plant	**HU4** - Confirmed SECURITY CONDITION or threat Which Indicates a Potential Degradation in the Level of Safety of the Plant		**HU5** - Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a NOUE

Fission Product Barrier Evaluation Modes 1, 2, 3 and 4

General Emergency	Site Area Emergency	Alert	Unusual Event
FG1 Loss of ANY Two Barriers AND Loss or Potential Loss of Third Barrier	**FS1** Loss or Potential Loss of ANY Two Barriers	**FA1** ANY Loss or ANY Potential Loss of EITHER Fuel Clad OR RCS	**FU1** ANY Loss or ANY Potential Loss of Containment

Fuel Clad Barrier

Loss	Potential Loss
1. Critical Safety Function Status Core-Cooling RED	**1. Critical Safety Function Status** Core Cooling-ORANGE **OR** Heat Sink-RED
2. Primary Coolant Activity Level Indications of RCS Coolant Activity greater than 300 µCi/gm Dose Equivalent I-131 (Figure 4 may be used to evaluate)	2. Primary Coolant Activity Level Not Applicable
3. Core Exit Thermocouple Readings 5th Hottest CETC greater than 1200°F	**3. Core Exit Thermocouple Readings** 5th Hottest CETC greater than 700°F
4. Reactor Vessel Water Level (p. 25) Not Applicable	**4. Reactor Vessel Water Level** RVLS Plenum LEVEL less than 0%
5. Containment Radiation Monitoring Containment Radiation Monitor RE-27 A **OR** B greater than 80 R/hr	5. Containment Radiation Monitoring Not Applicable
6. Other Indications Not applicable	6. Other Indications Not applicable
7. Emergency Director Judgment Judgment by the ED that the Fuel Clad Barrier is lost. Consider conditions not addressed and inability to determine the status of the Fuel Clad Barrier	**7. Emergency Director Judgment** Judgment by the ED that the Fuel Clad Barrier is potentially lost. Consider conditions not addressed and inability to determine the status of the Fuel Clad Barrier.

RCS Barrier

Loss	Potential Loss
1. Critical Safety Function Status Not Applicable	**1. Critical Safety Function Status** RCS Integrity-RED **OR** Heat Sink-RED
2. RCS Leak Rate RCS subcooling less than 16°F {less than 45° F Adverse} due to an RCS leak greater than Charging / RHR capacity	**2. RCS Leak Rate** Non-isolable RCS leak (including SG tube Leakage) greater than120 GPM.
3. SG Tube Rupture EEP-3.0 entered due to SG tube rupture resulting in an ECCS actuation	3. SG Tube Rupture Not Applicable
4. Containment Radiation Monitoring CTMT Rad Monitor RE-2 greater than 100 mR/hr **OR** CTMT Radiation Monitor RE-7 greater than 200 mR/hr	4. Containment Radiation Monitoring Not Applicable
5. Other Indications Not applicable	**5. Other Indications** Unexplained level rise in ANY of the following: Containment sump Reactor Coolant Drain Tank (RCDT) Waste Holdup Tank (WHT)
6. Emergency Director Judgment Judgment by the ED that the RCS Barrier is lost. Consider conditions not addressed and inability to determine the status of the RCS Barrier	**6. Emergency Director Judgment** Judgment by the ED that the RCS Barrier is potentially lost. Consider conditions not addressed and inability to determine the status of the RCS Barrier.

Containment Barrier

Loss	Potential Loss
1. Critical Safety Function Status Not Applicable	**1. Critical Safety Function Status** Containment-RED
2. Containment Pressure Rapid unexplained CTMT pressure lowering following initial pressure rise **OR** Intersystem LOCA indicated by CTMT pressure or sump level response not consistent with a loss of primary or secondary coolant	2. Containment Pressure CTMT pressure greater than 54 psig and rising **OR** CTMT hydrogen concentration greater than 6% **OR** CTMT CSF - ORANGE **AND** Less than the following minimum operable equipment: One CTMT fan cooler **AND** One train of CTMT spray
3. Core Exit Thermocouple Reading Not applicable	**3. Core Exit Thermocouple Reading** CORE COOLING CSF - RED **OR** - ORANGE for greater than 15min **AND** RVLS LEVEL less than 0%
4. SG Secondary Side Release with Primary to Secondary Leakage RUPTURED S/G is also FAULTED outside of containment **OR** Primary-to-Secondary leakrate greater than 10 gpm with nonisolable steam release from affected S/G to the environment	4. SG Secondary Side Release with P-to-S Leakage Not applicable
5. CNMT Isolation Valves Status After CNMT Isolation CTMT isolation valves **OR** dampers **NOT** closed **AND** downstream pathway to the environment exists after Containment Isolation	5. CNMT Isolation Valves Status After CNMT Isolation Not Applicable
6. Significant Radioactive Inventory in Containment Not Applicable	**6. Significant Radioactive Inventory in Containment** CTMT Rad monitor RE-27 A **OR** B greater than 3000 R/hr
7. Other Indications Pathway to the environment exists based on VALID RE-10, RE-14, RE-21, **OR** RE-22 Alarms	7. Other Indications Not applicable
8. Emergency Director Judgment Judgment by the ED that the CTMT Barrier is lost. Consider conditions not addressed and inability to determine the status of the CTMT Barrier	**8. Emergency Director Judgment** Judgment by the ED that the CTMT Barrier is potentially lost. Consider conditions not addressed and inability to determine the status of the CTMT Barrier

Initiating Condition

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mR TEDE OR 5000 mR Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2 **OR** 3)

NOTE:	**If dose assessment results are available at the time of declaration, the classification should be based on Threshold Value #2 instead of Threshold Value #1.While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.**

NOTE:	**The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.**

1. VALID reading on any of the following radiation monitors that exceeds OR expected to exceed the reading shown for 15 minutes OR longer:

Steam jet Air Ejector RE-15C	Off scale high
Plant Vent Stack RE-29B (NG)	60 μCi/cc
Steam Generator Relief RE-60A,B,C	70 μCi/cc (67 R/hr)
TDAFW Steam Exhaust RE-60D	800 μCi/cc (770 R/hr)

2. Dose assessment using actual meteorology indicates doses greater than 1,000 mR TEDE **OR** 5,000 mR thyroid CDE at **OR** beyond the site boundary.

3. Field survey results indicate closed window dose rates exceeding 1,000 mR/hr expected to continue for more than one hour; **OR** analyses of field survey samples indicate thyroid CDE of 5,000 mR for one hour of inhalation, at **OR** beyond site boundary.

Basis:

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

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed the EPA Protective Action Guides (PAGs). Public protective actions will be necessary. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public and likely involve fuel damage. While these failures are addressed by other ICs, this IC provides appropriate diversity and addresses events which may not be able to be classified on the basis of plant status alone. It is important to note that, for the more severe accidents, the release may be unmonitored or there may be large uncertainties associated with the source term and/or meteorology.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

The monitor reading Threshold Values are determined using a dose assessment method that back calculates from the dose values specified in the IC. The meteorology and source term (noble gases, particulates, and halogens) used are the same as those used for determining the monitor reading Threshold Values in ICs RU1 and RA1. This protocol will maintain intervals between the Threshold Values for the four classifications. Since doses are generally not monitored in real-time, a release duration of one hour is assumed, and that the Threshold Values are based on a site boundary (or beyond) dose of 1,000 mR/hour whole body or 5,000 mR/hour thyroid, whichever is more limiting.

Since dose assessment is based on actual meteorology, whereas the monitor reading Threshold Values are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made the dose assessment results override the monitor reading Threshold Values. Classification should not be delayed pending the results of these dose assessments.

¶RS1

Initiating Condition

Offsite Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR TEDE **OR** 500 mR Thyroid CDE for the Actual or Projected Duration of the Release.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2 **OR** 3)

> **NOTE: If dose assessment results are available at the time of declaration, the classification should be based on Threshold Value #2 instead of Threshold Value #1.While necessary declarations should not be delayed awaiting results, the dose assessment should be initiated / completed in order to determine if the classification should be subsequently escalated.**

> **NOTE: The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.**

1. VALID reading on any of the following radiation monitors that exceeds **OR** is expected to exceed the reading shown for 15 minutes **OR** longer:

Steam jet Air Ejector RE-15C	800 μCi/cc (770 R/hr)
Plant Vent Stack RE-29B (NG)	6 μCi/cc
Steam Generator Relief RE-60A,B,C	7 μCi/cc (6.7 R/hr)
TDAFW Steam Exhaust RE-60D	80 μCi/cc (77 R/hr)

2. Dose assessment using actual meteorology indicates doses greater than 100 mR TEDE **OR** 500 mR thyroid CDE at **OR** beyond the site boundary.

3. Field survey results indicate closed window dose rates exceeding 100 mR/hr expected to continue for more than one hour; **OR** analyses of field survey samples indicate thyroid CDE of 500 mR for one hour of inhalation, at **OR** beyond the site boundary.

Basis:

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

This IC addresses radioactivity releases that result in doses at or beyond the site boundary that exceed a small fraction of the EPA Protective Action Guides (PAGs). Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

The monitor reading Threshold Values are determined using a dose assessment method that back calculates from the dose values specified in the IC. The meteorology and source term (noble gases, particulates, and halogens) used is the same as those used for determining the monitor reading Threshold Values in ICs RU1 and RA1. This protocol maintains intervals between the Threshold Values for the four classifications. Since doses are generally not monitored in real-time, a release duration of one hour is assumed, and that the Threshold Values be based on a site boundary (or beyond) dose of 100 mR/hour whole body or 500 mR/hour thyroid, whichever is more limiting.

The release rates which result in site boundary doses of 100 mR TEDE are in excess of the range of the monitors listed in RU1 and RA1.

Since dose assessment is based on actual meteorology, whereas the monitor reading Threshold Values are not, the results from these assessments may indicate that the classification is not warranted, or may indicate that a higher classification is warranted. For this reason, emergency implementing procedures should call for the timely performance of dose assessments using actual meteorology and release information. If the results of these dose assessments are available when the classification is made (*e.g.*, initiated at a lower classification level), the dose assessment results override the monitor reading Threshold Values. Classification should not be delayed pending the results of these dose assessments.

Initiating Condition

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 200 Times the Radiological Effluent Technical Specifications for 15 Minutes or Longer.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2 **OR** 3)

NOTE:	The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.

1. VALID reading on any effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes **OR** longer.

2.

Monitor		200 X Setpoint Value
Liquid Radwaste Effluent Line (RE-18)		Greater than **OR** equal to $1x10^6$ cpm.
Steam Generator Blowdown Effluent Line (RE-23B)		2.80×10^5 cpm
Steam Jet Air Ejector RE-15A		Greater than **OR** equal to 1×10^6 cpm
Plant Vent Gas	RE-14	Greater than **OR** equal to 1×10^6 cpm.
	RE-22	4.36×10^4 cpm
	RE-29B (NG)	8.88×10^{-2} μCi/ml

2. VALID reading on any of the following radiation monitors that exceeds the reading shown for 15 minutes **OR** longer:

Main Steam Atmos Relief (R60A,B,C)	1.42×10^4 mR/hr
TDAFW Exhaust (R60D)	1.42×10^4 mR/hr

3. Confirmed sample analyses for gaseous or liquid releases indicates concentrations **OR** release rates in excess of 200 times Technical Specification 5.5.4.b as confirmed by ODCM , with a release duration of 15 minutes **OR** longer.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

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

This IC addresses a potential or actual decline in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. **The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 15 minutes.** Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 15 minutes.

Threshold Value #1 addresses radioactivity releases that for whatever reason cause effluent radiation monitor readings that exceed two hundred times the alarm setpoint established by the radioactivity discharge permit. This alarm setpoint may be associated with a planned batch release, or a continuous release path.

Threshold Value #2 is similar to Threshold Value #1, but is intended to address effluent or accident radiation monitors on non-routine release pathways for which a discharge permit would not normally be prepared.

Threshold Value #3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

Threshold Values #1 and #2 directly correlate with the IC since annual average meteorology is required to be used in showing compliance with the RECP and is used in calculating the alarm setpoints.

Due to the uncertainty associated with meteorology, emergency implementing procedures should call for the timely performance of dose assessments using actual (real-time) meteorology in the event of a gaseous radioactivity release of this magnitude. The results of these assessments should be compared to the ICs RS1 and RG1 to determine if the event classification should be escalated.

¶RA2

Initiating Condition

Damage to Irradiated Fuel **OR** Loss of Water Level that Has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

Operating Mode Applicability: All

Threshold Values: (1 OR 2)

1. UNPLANNED VALID alarm on any of the following radiation monitors:

Drumming Station RE-0008
Containment Purge Ventilation Monitor RE-24A **OR** B
Spent Fuel Pool Ventilation Monitor RE-25A **OR** B
Spent Fuel Pool Area Radiation Monitor RE-5

2. Loss of water level that has or will result in the uncovering of irradiated fuel outside the Reactor Vessel as indicated by ANY of the following:

Report of personnel during fuel assembly movements.	
Spent Fuel Pool Storage	Less than El 129
Transfer Canal	Less than El 116.
Reactor Core Elevation	Less than El 118

Basis:

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

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC addresses specific events that have resulted, or may result, in unexpected rises in radiation dose rates within plant buildings, and may be a precursor to a radioactivity release to the environment. These events represent a loss of control over radioactive material and represent a degradation in the level of safety of the plant.

Threshold Value #1 addresses radiation monitor indications of fuel uncovery and/or fuel damage. Raised readings on ventilation monitors may be indication of a radioactivity release from the fuel, confirming that damage has occurred. Raised background at the monitor due to water level lowering may mask raised ventilation exhaust airborne activity and needs to be considered. Application of these Initiating Conditions requires understanding of the actual radiological conditions present in the vicinity of the monitor.

In Threshold Value #2, indications include water level and personnel reports. Visual observation will be the primary indicator for spent fuel pool and fuel movement activities. Personnel report during fuel assembly movements is included to ensure that reports of actual or potential fuel uncovery is classified. If available, video cameras may allow remote observation. Depending on available level indication, the declaration threshold may need to be based on indications of water makeup rate or lowering in refueling water storage tank level.

¶RA3

Initiating Condition

Release of Radioactive Material or Rises in Radiation Levels Within the Facility That Impedes Operation of Systems Required to Maintain Safe Operations or to Establish or Maintain Cold Shutdown

Operating Mode Applicability: All

Threshold Values: (1 OR 2)

1. VALID radiation monitor readings greater than 15 mR/hr in areas requiring continuous occupancy to maintain plant safety functions:

Control Room radiation monitor	RE-1A

2. UNPLANNED VALID radiation readings greater than 1 R/hr values in the following areas requiring infrequent access to maintain plant safety functions.

RadioChemistry Lab Area RE-3	Electrical And Piping Penetration Rooms
Charging Pump Room Area RE-4	VCT Valve Room
Sample Room Area RE-6	Seal Water HX Room
Lower Equipment Room	CCW HX Room
Main Steam Valve Room	Turbine Building Air Compressor Area
4160 Volt ESF Bus Rooms	DC Switchgear Rooms
Control Rod Drive Room	Valve Box 1, 2, 3 and 4
Diesel Building	Service Water Intake Structure
Hot shutdown Panels	

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

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

This IC addresses raised radiation levels that impede necessary access to operating stations, or other areas containing equipment that must be operated manually or that requires local monitoring, in order to maintain safe operation or perform a safe shutdown. It is this impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant. The cause and/or magnitude of the rise in radiation levels is not a concern of this IC. The Emergency Director must consider the source or cause of the raised radiation levels and determine if any other IC may be involved.

This IC is not meant to apply to anticipated temporary rises due to planned events.

The area requiring continuous occupancy is the control room and the central alarm station. The Central Alarm Station is in the Control Room envelope. The value of 15mR/hr is derived from the GDC 19 value of 5 rem in 30 days with adjustment for expected occupancy times.

For areas requiring infrequent access, the 1 R/hr (Locked High Rad Area) is based on radiation levels which result in exposure control measures intended to maintain doses within normal occupational exposure guidelines and limits (i.e., 10 CFR 20), and in doing so, will impede necessary access. As used here, *impede,* includes hindering or interfering provided that the interference or delay is sufficient to significantly threaten the safe operation of the plant.

Initiating Condition

Any UNPLANNED Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two Times the Radiological Effluent Technical Specifications for 60 Minutes or Longer.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2 **OR** 3)

NOTE: The Emergency Director should not wait until 60 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 60 minutes.

1. VALID reading on any effluent monitor that exceeds two times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes **OR** longer.

2.

Monitor	2 X Setpoint Value
Liquid Radwaste Effluent Line RE-18	2.00×10^5 cpm (planned release) 1.58×10^4 cpm (no planned release)
Steam Generator Blowdown Effluent Line RE-23B	2.80×10^3 cpm
Steam Jet Air Ejector RE-15	3.54×10^2cpm
Plant Vent Gas RE-14 RE-22 RE-29B (NG)	3.64×10^4 cpm 4.36×10^2 cpm 8.88×10^{-4} μCi/ml

2. VALID reading on any of the following radiation monitors that exceeds the reading shown for 60 minutes **OR** longer:

Main Steam Atmos Relief R60A,B,C	142 mR/hr
TDAFW Exhaust R60D	142 mR/hr

3. Confirmed sample analyses for gaseous **OR** liquid releases indicates concentrations **OR** release rates, with a release duration of 60 minutes **OR** longer, in excess of two times Technical Specification 5.5.4.b, as confirmed by the ODCM.

Basis:

UNPLANNED, as used in this context, includes any release for which a radioactivity discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm setpoints, etc.) on the applicable permit. The Emergency Director should not wait until 60 minutes has elapsed, but should declare the event as soon as it is determined that the release duration has or will likely exceed 60 minutes. Also, if an ongoing release is detected and the starting time for that release is unknown, the Emergency Director should, in the absence of data to the contrary, assume that the release has exceeded 60 minutes.

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

This IC addresses a potential or actual decline in the level of safety of the plant as indicated by a radiological release that exceeds regulatory commitments for an extended period of time. Nuclear power plants incorporate features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, or control and monitor intentional releases. These controls are located in the Offsite Dose Calculation Manual (ODCM), Ref 2. The occurrence of extended, uncontrolled radioactive releases to the environment is indicative of a degradation in these features and/or controls.

Threshold Value #1 addresses radioactivity releases, that for whatever reason, cause effluent radiation monitor readings to exceed two times the Technical Specification limit and releases are not terminated within 60 minutes. This alarm setpoint may be associated with a planned batch release, or a continuous release path. In either case, the setpoint is established by the ODCM to warn of a release that is not in compliance with the TS 5.5.4. Indexing the Threshold Value to the ODCM setpoints in this manner ensures that the Threshold Value will never be less than the setpoint established by a specific discharge permit.

Threshold Value #2 is intended for effluent monitoring on non-routine release pathways for which a discharge permit would not normally be prepared. The ODCM establishes a methodology for determining effluent radiation monitor setpoints. The ODCM specifies default source terms and, for gaseous releases, prescribes the use of pre-determined annual average meteorology in the most limiting downwind sector for showing compliance with the regulatory commitments. These monitor reading Threshold Values are determined using this methodology.

Threshold Value #3 addresses uncontrolled releases that are detected by sample analyses, particularly on unmonitored pathways, e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.

¶RU2

Initiating Condition

Unexpected Rise in Plant Radiation.

Operating Mode Applicability: All

Threshold Values: (1.a **AND** b. **OR** 2)

1. a. VALID indication of uncontrolled water level lowering in the reactor refueling cavity, spent fuel pool, **OR** fuel transfer canal with all irradiated fuel assemblies remaining covered by water.

Personnel report of low water level
Annunciator EH2 “SFP LVL HI/LO”
Personnel report of cavitation **OR** low discharge pressure for SFP Pump Discharge Pressure **AND/OR** RHR Pump Discharge Pressure

AND

b. UNPLANNED VALID Direct Area Radiation Monitor readings rise on any of the following:

RE-0005 in the fuel building
RE-0002 in containment
RE-0027A **OR** B in containment

2. UNPLANNED VALID Direct Area Radiation Monitor readings rise by a factor of 1000 over normal* levels.

*Normal levels can be considered as the highest reading in the past twenty-four hours excluding the current peak value.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

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

This IC addresses raised radiation levels as a result of water level lowering above the RPV flange or events that have resulted, or may result, in unexpected rises in radiation dose rates within plant buildings. These radiation rises represent a loss of control over radioactive material and may represent a potential degradation in the level of safety of the plant.

Classification as a NOUE is warranted as a precursor to a more serious event. Indications include instrumentation such as water level and local area radiation monitors, equipment parameters and personnel (e.g., refueling crew) reports. If available, video cameras may allow remote observation. Depending on available level instrumentation, the declaration threshold may need to be based on indications of water makeup rate or lowering in refueling water storage tank level.

Threshold Value 1a: Personnel report of low water level is the primary indicator.

Threshold Value 1b limits:
FSAR 9.1.3.1.2 indicates that 12 feet of water above the stored fuel yields a dose rate of about 2.5 mR/hr. These monitors do not directly see the fuel, but see the dose reflected from the ceiling or containment dome, A conservative reduction on reflection is 10^{-2} (Ref. 10). Thus when on-scale, the lowest reading monitor (RE-0005, 10^4 mR/hr, Ref. 8, Table 3.3-6) equivalent reading at the pool surface would be 10^6 mR/hr. Then a rise from a general area dose rate of 2.5 mR/hr represents log (10^6/2.5) = 5.6 1/10th thicknesses. Assuming a 1/10th thickness is 2 feet (Ref. 11), the monitor reading rise is equivalent to a water level lowering of 5.6 x 2 = 11.2 feet. Thus the fuel would have at least 6 inches of water cover.

Threshold Value #2 addresses UNPLANNED rises in in-plant radiation levels that represent a degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant.

Fission Product Barrier Degradation

	NOUE		ALERT		SITE AREA EMERGENCY		GENERAL EMERGENCY
FU1	ANY Loss or ANY Potential Loss of Containment *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FA1**	ANY Loss or ANY Potential Loss of **EITHER** Fuel Clad **OR** RCS *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FS1**	Loss or Potential Loss of ANY Two Barriers *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*	**FG1**	Loss of ANY Two Barriers **AND** Loss or Potential Loss of Third Barrier *Op. Modes: Power Operation, Hot Standby, Startup, Hot Shutdown*

NOTES

1. The logic used for these initiating conditions reflects the following considerations:

   - The Fuel Clad Barrier and the RCS Barrier are weighted more heavily than the Containment Barrier. NOUE ICs associated with RCS and Fuel Clad Barriers are addressed under System Malfunction ICs.

   - At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from the threshold for a General Emergency. For example, if Fuel Clad and RCS Barrier "Loss" Threshold Values existed, that, in addition to offsite dose assessments, would require continual assessments of radioactive inventory and containment integrity. Alternatively, if both Fuel Clad and RCS Barrier "Potential Loss" Threshold Values existed, the Emergency Director would have more assurance that there was no immediate need to escalate to a General Emergency.

   - The ability to escalate to higher emergency classes as an event deteriorates must be maintained. For example, RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Farley Fission Product Barrier Evaluation

FUEL CLAD BARRIER Threshold Values:

The Fuel Clad Barrier is the zircalloy or stainless steel tubes that contain the fuel pellets.

1. Critical Safety Function Status

NOTE:	**Heat Sink CSF should not be considered –RED if total AFW flow is less than 395 gpm due to operator action.**

RED path indicates an extreme challenge to the safety function. ORANGE path indicates a severe challenge to the safety function.

Core Cooling - ORANGE indicates subcooling has been lost and that some clad damage may occur. Heat Sink - RED indicates the ultimate heat sink function is under extreme challenge and thus these two items indicate potential loss of the Fuel Clad Barrier.

Core Cooling - RED indicates significant superheating and core uncovery and is considered to indicate loss of the Fuel Clad Barrier.

2. Primary Coolant Activity Level

The 300 μCi/gm I_{131} equivalent. Assessment by the NUMARC EAL Task Force indicates that this amount of coolant activity is well above that expected for iodine spikes and corresponds to less than 5% fuel clad damage. This amount of radioactivity indicates significant clad damage and thus the Fuel Clad Barrier is considered lost. (Figure 4 may be used to evaluate)

There is no equivalent "Potential Loss" Threshold Value for this item.

3. Core Exit Thermocouple Readings

Core Exit Thermocouple Readings are included in addition to the Critical Safety Functions to include conditions when the CSFs may not be in use.

The "Loss" Threshold Value of 1200 degrees F corresponds to significant superheating of the coolant. This value corresponds to the temperature reading that indicates core cooling - RED in Fuel Clad Barrier Threshold Value #1.

The "Potential Loss" Threshold Value of 700 degrees F corresponds to loss of subcooling. This value corresponds to the temperature reading that indicates core cooling - ORANGE in Fuel Clad Barrier Threshold Value #1.

4. Reactor Vessel Water Level

There is no "Loss" Threshold Value corresponding to this item because it is better covered by the other Fuel Clad Barrier "Loss" Threshold Values.
The 0% RVLIS value for the "Potential Loss" Threshold Value corresponds to the top of the active fuel. The "Potential Loss" Threshold Value is defined by the Core Cooling - ORANGE path.

5. Containment Radiation Monitoring

The greater than 80 R/hr reading is a value which indicates the release of reactor coolant, with elevated activity indicative of fuel damage, into the containment. The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with a concentration of 300 μCi/gm dose equivalent I-131 into the containment atmosphere. Reactor coolant concentrations of this magnitude are several times larger than the maximum concentrations (including iodine spiking) allowed within technical specifications and are therefore indicative of fuel damage. This value is higher than that specified for RCS barrier Loss Threshold Value #4. Thus, this Threshold Value indicates a loss of both the fuel clad barrier and a loss of RCS barrier.

There is no "Potential Loss" Threshold Value associated with this item.

7. Emergency Director Judgment

This Threshold Value addresses any other factors that are to be used by the Emergency Director in determining whether the Fuel Clad barrier is lost or potentially lost. In addition, the inability to monitor the barrier is incorporated in this Threshold Value as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

RCS BARRIER Threshold Values:

The RCS Barrier includes the RCS primary side and its connections up to and including the pressurizer safety and relief valves, and other connections up to and including the primary isolation valves.

1. Critical Safety Function Status

There is no "Loss" Threshold Value associated with this item.

NOTE:	**Heat Sink CSF should not be considered –RED if total AFW flow is less than 395 gpm due to operator action.**

This Threshold Value uses the Critical Safety Function Status Tree (CSFST) monitoring and functional restoration procedures. An RCS Integrity RED path indicates an extreme challenge to the safety function derived from appropriate instrument readings, and these CSFs indicate a potential loss of RCS barrier.

2. RCS Leak Rate

The "Loss" Threshold Value addresses conditions where leakage from the RCS is greater than available inventory control capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the inventory control systems are inadequate in maintaining RCS pressure and inventory against the mass loss through the leak.

The "Potential Loss" Threshold Value is based on the inability to maintain normal liquid inventory within the Reactor Coolant System (RCS) by normal operation of the Chemical and Volume Control System which is considered as one centrifugal charging pump discharging to the charging header. A second charging pump being required is indicative of a substantial RCS leak providing the 120 GPM value.

3. SG Tube Rupture

This Threshold Value is intended to address the full spectrum of Steam Generator (SG) tube rupture events in conjunction with Containment Barrier "Loss" Threshold Value #4 and Fuel Clad Barrier Threshold Values. The "Loss" Threshold Value addresses RUPTURED SG(s) for which the leakage is large enough to cause actuation of ECCS (SI). This is consistent to the RCS Barrier "Potential Loss" Threshold Value #2. This condition is described by EEP-3.0 entered. By itself, this Threshold Value will result in the declaration of an Alert. However, if the SG is also FAULTED (i.e., two barriers failed), the declaration escalates to a Site Area Emergency per Containment Barrier "Loss" Threshold Value #4.

There is no "Potential Loss" Threshold Value.

4. Containment Radiation Monitoring

The RE-2 greater than 100 mR/hr and RE-7 greater than 200 mR/hr threshold is a value which indicates the release of reactor coolant to the containment. The reading is calculated assuming the instantaneous release and dispersal of the reactor coolant noble gas and iodine inventory associated with normal operating concentrations (i.e., within T/S) into the containment atmosphere. This value is less than that specified for Fuel Clad Barrier Threshold Value #5. Thus, this Threshold Value would be indicative of a RCS leak only. If the radiation monitor reading rise to that specified by Fuel Clad Barrier Threshold Value #5, fuel damage would also be indicated.

There is no "Potential Loss" Threshold Value associated with this item.

5. Other Indications

There is no "Loss" Threshold Value associated with this item.

An unexplained level rise in the containment sump, Reactor Coolant Drain Tank or the Waste Holdup Tank could indicate a RCS leak and is therefore included as a Potential Loss of the RCS Barrier.

6. Emergency Director Judgment

This Threshold Value addresses any other factors that are to be used by the Emergency Director in determining whether the RCS barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this Threshold Value as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

CONTAINMENT BARRIER Threshold Values:

The Containment Barrier includes the containment building, its connections up to and including the outermost containment isolation valves. This barrier also includes the main steam, feedwater, and blowdown line extensions outside the containment building up to and including the outermost secondary side isolation valve.

1. Critical Safety Function Status

There is no "Loss" Threshold Value associated with this item.

This Threshold Value uses Critical Safety Function Status Tree (CSFST) monitoring and functional restoration procedures. Containment RED path indicates an extreme challenge to the safety function derived from appropriate instrument readings and/or sampling results, and thus represents a potential loss of containment. Conditions leading to a containment RED path result from RCS barrier and/or Fuel Clad Barrier Loss. Thus, this Threshold Value is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier.

2. Containment Pressure

Rapid unexplained loss of pressure (i.e., not attributable to containment spray or condensation effects) following an initial pressure rise indicates a loss of containment integrity. Containment pressure and sump levels should rise as a result of the mass and energy release into containment from a LOCA. Thus, sump level or pressure not increasing indicates containment bypass and a loss of containment integrity.

The 27 PSIG for potential loss of containment is based on one-half the containment design pressure. Existence of an explosive mixture means a hydrogen and oxygen concentration of at least the lower deflagration limit (greater than 6%) curve exists. The indications of potential loss under this Threshold Value corresponds to some of those leading to the RED path in Threshold Value #1 above and may be declared. As described above, this Threshold Value is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier.

The second potential loss Threshold Value represents a potential loss of containment in that the containment heat removal/depressurization system (e.g., containment sprays, fan coolers, etc., but not including containment venting strategies) are either lost or performing in a degraded manner, as indicated by containment pressure greater than the setpoint at which the equipment was supposed to have actuated.

3. Core Exit Thermocouples

There is no "Loss" Threshold Value associated with this item.

In this Threshold Value, the function restoration procedures are those emergency operating procedures that address the recovery of the core cooling critical safety functions. The procedure is considered effective if the temperature is decreasing or if the vessel water level is increasing. For units using the CSF status trees a direct correlation to those status trees can be made if the effectiveness of the restoration procedures is also evaluated as stated below.

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within 15 minutes. The Emergency Director should make the declaration as soon as it is determined that the procedures have been, or will be ineffective. The reactor vessel level chosen should be consistent with the emergency response guides applicable to the facility.

The conditions in this potential loss Threshold Value represent an imminent core melt sequence which, if not corrected, could lead to vessel failure and an raised potential for containment failure. In conjunction with the Core Cooling and Heat Sink criteria in the Fuel and RCS barrier columns, this Threshold Value would result in the declaration of a General Emergency -- loss of two barriers and the potential loss of a third. If the function restoration procedures are ineffective, there is no "success" path.

4. SG Secondary Side Release With Primary To Secondary Leakage

This "loss" Threshold Value recognizes that SG tube leakage can represent a bypass of the containment barrier as well as a loss of the RCS barrier. The "loss" Threshold Value addresses the condition in which a RUPTURED steam generator is also FAULTED. This condition represents a bypass of the RCS and containment barriers. In conjunction with RCS Barrier "loss" Threshold Value #3, this would always result in the declaration of a Site Area Emergency.

The other leakage "loss" Threshold Value addresses SG tube leaks that exceed 10 gpm in conjunction with a nonisolable release path to the environment from the affected steam generator. The threshold for establishing the nonisolable secondary side release is intended to be a prolonged release of radioactivity from the RUPTURED steam generator directly to the environment. This could be expected to occur when the main condenser is unavailable to accept the contaminated steam (i.e., SGTR with concurrent loss of offsite power and the RUPTURED steam generator is required for plant cooldown or a stuck open relief valve). If the main condenser is available, there may be releases via air ejectors, gland seal exhausters, and other similar controlled, and often monitored, pathways. These pathways do not meet the intent of a nonisolable release path to the environment. These minor releases are assessed using Abnormal Rad Levels / Radiological Effluent ICs.

5. Containment Isolation Valve Status After Containment Isolation

This Threshold Value addresses incomplete containment isolation that allows direct release to the environment. It represents a loss of the containment barrier.

The use of the modifier "direct" in defining the release path discriminates against release paths through interfacing liquid systems. The existence of an in–line charcoal filter does not make a release path indirect since the filter is not effective at removing fission noble gases. Typical filters have an efficiency of 95-99% removal of iodine. Given the magnitude of the core inventory of iodine, significant releases could still occur. In addition, since the fission product release would be driven by boiling in the reactor vessel, the high humidity in the release stream can be expected to render the filters ineffective in a short period.

There is no "Potential Loss" Threshold Value associated with this item.

6. Significant Radioactive Inventory in Containment

There is no "Loss" Threshold Value associated with this item.

The greater than 3000 R/hr value indicates significant fuel damage well in excess of the Threshold Values associated with both loss of Fuel Clad and loss of RCS Barriers. A major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant.

Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted. NUREG-1228, "Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents," indicates that such conditions do not exist when the amount of clad damage is less than 20%. A radiation monitor reading corresponding to 20% fuel clad damage is specified here.

7. Other Indications

Leakage from the Containment would be routed through various ventilation systems where the specific monitors would indicate a release. R10, R14, R21, **OR** R22 Alarms would indicate a breach in containment.

8. Emergency Director Judgment

This Threshold Value addresses any other factors that are to be used by the Emergency Director in determining whether the Containment barrier is lost or potentially lost. In addition, the inability to monitor the barrier should also be incorporated in this Threshold Value as a factor in Emergency Director judgment that the barrier may be considered lost or potentially lost.

SG1

Initiating Condition

Prolonged Loss of All Offsite Power **AND** Prolonged Loss of All Onsite AC Power to Essential Busses.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1 **AND EITHER** 2 **OR** 3)

1. Loss of ALL AC power indicated by:

   a. Loss of offsite power to **OR** from Start Up Transformers 1(2)A **AND** 1(2)B resulting in loss of all offsite electrical power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G for greater than 15 minutes

   AND

   b. Failure of emergency diesel generators to supply power to emergency busses.

   AND EITHER

2. Restoration of at least one 4160V ESF bus, 1(2)F **OR** 1(2)G, within 4 hr. of time of loss is **NOT** likely

   OR

3. Fuel Clad Barrier Evaluation indicates continuing degradation (Loss or Potential Loss) due to core cooling.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will lead to loss of fuel clad, RCS, and containment. The 4 hours to restore AC power is based on a site blackout coping analysis. Appropriate allowance for offsite emergency response including evacuation of surrounding areas should be considered. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.

In addition, under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Director a reasonable idea of how quickly (s)he may need to declare a General Emergency based on two major considerations:

1. Are there any present indications that core cooling is already degraded to the point that Loss or Potential Loss of Fission Product Barriers is imminent?

2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of the third barrier can be prevented?

Thus, indication of continuing core cooling degradation must be based on Fission Product Barrier monitoring with particular emphasis on Emergency Director judgment as it relates to imminent Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

Initiating Condition

Failure of the Reactor Protection System to Complete an Automatic Trip **AND** Manual Trip was NOT Successful **AND** there is Indication of an Extreme Challenge to the Ability to Cool the Core.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)

Threshold Value: (1 AND EITHER a OR b)

NOTE:	**A successful manual trip for purposes of declaration is any action taken from the MCB that rapidly inserts the control rods. This can be accomplished by tripping the reactor using the Reactor Trip switches on the MCB OR by de-energizing both Rod Drive Motor Generator sets from the MCB.**

NOTE:	**Heat Sink CSF should not be considered RED if total AFW flow is less than 395 gpm due to operator action.**

NOTE	**Failure of both MCB Rx Trip switches to trip the reactor meets the TV criteria of a setpoint being exceeded with no automatic trip occurring.**

1. Indications exist that a reactor protection system setpoint was exceeded and automatic trip did not occur, and a manual trip did not result in the reactor being made subcritical.

   AND EITHER

   a. Core Cooling CSF - RED

   OR

   b. Heat Sink CSF - RED

Basis:

Automatic and manual trip are not considered successful if action away from the reactor control console is required to trip the reactor. Under the conditions of this IC and its associated Threshold Values, the efforts to bring the reactor subcritical have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed. Although there are capabilities away from the reactor control console, such as emergency boration, the continuing temperature rise indicates that these capabilities are not effective. This situation could be a precursor for a core melt sequence. This Threshold Value equates to a Subcriticality RED condition.

The extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200 degrees F or that the reactor vessel water level is below the top of active fuel. This Threshold Value equates to a Core Cooling RED condition.

Another consideration is the inability to initially remove heat during the early stages of this sequence. If emergency feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, an extreme challenge should be considered to exist. This Threshold Value equates to a Heat Sink RED condition.

In the event either of these challenges exist at a time that the reactor has not been brought below the power associated with the safety system design (typically 3 to 5% power) a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum offsite intervention time.

Initiating Condition

Loss of All Offsite Power **AND** Loss of All Onsite AC Power to Essential Busses.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1a **AND** 1b **AND** 1c)

1. Loss of all AC power indicated by:
   a. Loss of offsite power to **OR** from Start Up Transformers 1(2)A **AND** 1(2)B resulting in loss of all offsite electrical power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G for greater than 15 minutes

   AND

   b. Failure of emergency diesel generators to supply power to emergency busses.

   AND

   c. Restoration of at least one 4160V ESF bus, F **OR** G, has **NOT** occurred within 15 minutes of time of loss of all AC power

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will cause core uncovering and loss of containment integrity, thus this event can escalate to a General Emergency. The 15 minute time duration is selected to exclude transient or momentary power losses.

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential busses. Even though an essential bus may be energized, if necessary loads are not operable on the energized bus then the bus should not be considered operable.

Initiating Condition

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded **AND** Manual Trip Was NOT Successful.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)

Threshold Value: (1)

NOTE:	**A successful manual trip for purposes of declaration is any action taken from the MCB that rapidly inserts the control rods. This can be accomplished by tripping the reactor using the Reactor Trip switches on the MCB OR by de-energizing both Rod Drive Motor Generator sets from the MCB.**

NOTE	**Failure of both MCB Rx Trip switches to trip the reactor meets the TV criteria of a setpoint being exceeded with no automatic trip occurring.**

1. Indications exist that a reactor protection system setpoint was exceeded and automatic trip did not occur, and a manual trip did not result in the reactor being made subcritical. (NOTE)

Basis:

Automatic and manual trip are not considered successful if action away from the reactor control console was required to trip the reactor.

The Reactor should be considered subcritical when reactor power level has been reduced to less than 5% power and SUR is negative.

Under these continued power generation conditions, the reactor may be producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that may lead to imminent loss or potential loss of both fuel clad and RCS. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response. Escalation of this event to a General Emergency would be via Fission Product Barrier Degradation or Emergency Director Judgment ICs. A manual reactor trip is considered to be a trip input to the automatic Reactor Protection System.

Initiating Condition

Loss of All Vital DC Power.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1)

1. Loss of all Vital DC power to 125 VDC Bus A **AND** B indicated by bus voltage indications less than 105 VDC for greater than 15 minutes.

Basis:

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system.

105 VDC bus voltage is based on the minimum bus voltage necessary for the operation of safety related equipment. This voltage value incorporates a margin of at least 15 minutes of operation before the onset of inability to operate those loads.

¶SS4

Initiating Condition

Complete Loss of Heat Removal Capability.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1a <u>AND</u> 1b)

NOTE:	**Heat Sink CSF should not be considered –RED if total AFW flow is less than 395 gpm due to operator action.**

1. Complete Loss of Heat Removal Capability as indicated by:

   a. Core Cooling CSF - ORANGE

   <u>AND</u>

   b. Heat Sink CSF - RED

Basis:

This Threshold Value addresses complete loss of functions, including ultimate heat sink (NSCW), required for hot shutdown with the reactor at pressure and temperature. Reactivity control is addressed in other Threshold Values.

Under these conditions, there is an actual major failure of a system intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted.

Initiating Condition

Inability to Monitor a SIGNIFICANT TRANSIENT in Progress.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1a **AND** 1b **AND** 1c **AND** 1d)

1. a. A SIGNIFICANT TRANSIENT in progress

   AND

   b. Loss of most **OR** all (approximately 75% of the MCB) annunciators **OR** indicators associated with safety systems

   AND

   c. Compensatory non-alarming indications are **NOT** available

   AND

   d. Indications needed to monitor the Critical Safety Function Status Tree parameters are **NOT** available

Basis:

SIGNIFICANT TRANSIENT: is an UNPLANNED event involving one or more of the following: (1) automatic turbine runback greater than 25% thermal reactor power, (2) electrical load rejection greater than 25% full electrical load, (3) Reactor Trip, (4) Safety Injection Activation, or (5) thermal power oscillations greater than 10%.

This IC and its associated Threshold Value are intended to recognize the inability of the control room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the control room staff cannot monitor safety functions needed for protection of the public.

The annunciators for this Threshold Value are limited to include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other Threshold Values.

"Compensatory non-alarming indications" in this context includes computer based information such as SPDS.

The indications needed to monitor safety functions necessary for protection of the public must include control room indications, computer generated indications and dedicated annunciation capability. The specific indications are those used to determine such functions as the ability to shut down the reactor, maintain the core cooled, to maintain the reactor coolant system intact, and to maintain containment intact.

"Planned" and “UNPLANNED” actions are not differentiated since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not an ameliorating factor.

Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is a greater risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Supervisor be tasked with making a judgment decision as to whether additional personnel are required to provide augmented monitoring of system operation.

Initiating Condition

Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Setpoint Has Been Exceeded **AND** Manual Trip Was Successful.

Operating Mode Applicability:	Power Operation (Mode 1) Startup (Mode 2) Hot Standby (Mode 3)
Threshold Value:	(1)

NOTE:	**A successful manual trip for purposes of declaration is any action taken from the MCB that rapidly inserts the control rods. This can be accomplished by tripping the reactor using the Reactor Trip switches on the MCB OR by de-energizing both Rod Drive Motor Generator sets from the MCB.**

NOTE	**Failure of both MCB Rx Trip switches to trip the reactor meets the TV criteria of a setpoint being exceeded with no automatic trip occurring.**

1. Indication(s) exist that a reactor protection setpoint was exceeded and an automatic trip did not occur, and a manual trip resulted in the reactor being subcritical.

Basis:

This condition indicates failure of the automatic protection system to trip the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient and thus the plant safety has been compromised, and design limits of the fuel may have been exceeded. An Alert is indicated because conditions exist that lead to potential loss of fuel clad or RCS. Reactor protection system setpoint being exceeded, rather than limiting safety system setpoint being exceeded, is specified here because failure of the automatic protection system is the issue. A manual reactor trip is considered to be a trip input to the automatic Reactor Protection System or de-energizing the MG sets should initiate a manual trip.

The Reactor should be considered subcritical when reactor power level has been reduced to less than 5% power and SUR is negative.

¶SA4

Initiating Condition

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in the Control Room With **EITHER** (1) a SIGNIFICANT TRANSIENT in Progress, **OR** (2) Compensatory Non-Alarming Indicators are Unavailable.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1 **AND EITHER** a **OR** b)

1. UNPLANNED loss of most **OR** all (approximately 75% of the MCB) annunciators **OR** indicators associated with safety systems for greater than 15 minutes

 AND EITHER

 a. A SIGNIFICANT TRANSIENT is in progress

 OR

 b. Compensatory non-alarming indications are **NOT** available

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

SIGNIFICANT TRANSIENT: is an UNPLANNED event involving one or more of the following: (1) automatic turbine runback greater than 25% thermal reactor power, (2) electrical load rejection greater than 25% full electrical load, (3) Reactor Trip, (4) Safety Injection Activation, or (5) thermal power oscillations greater than 10%.

This IC and its associated Threshold Values are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a transient. Recognition of the availability of computer based indication equipment is considered. A "planned" loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is a greater risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. It is also not intended that the Shift Supervisor be tasked with making a judgment decision as to whether additional personnel are required to provide augmented monitoring of system operation.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this Threshold Value due to difficulty associated with assessment of plant conditions.

The annunciators or indicators for this Threshold Value include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other Threshold Values.

"Compensatory non-alarming indications" in this context includes computer based information such as SPDS. This should include all computer systems available for this use depending on specific plant design and subsequent retrofits. If both a major portion of the annunciation system and all computer monitoring are unavailable, the Alert is required.

Initiating Condition

AC power capability to essential busses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in station blackout.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1a **AND** 1b)

1. a. AC power capability to 4160V ESF busses 1(2)F **AND** 1(2)G reduced to a single power source for greater than 15 minutes

   AND

   b. ANY additional single failure will result in station blackout.

Basis:

This IC and the associated Threshold Values are intended to provide an escalation from IC SU1, "Loss of All Offsite Power To Essential Busses for Greater Than 15 Minutes." The condition indicated by this IC is the degradation of the offsite and onsite power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of one emergency generator to supply power to its emergency busses. Another related condition could be the loss of all offsite power and loss of onsite emergency diesels with only one train of emergency busses being backfed from the SAT, or the loss of onsite emergency diesels with only one train of emergency busses being backfed from offsite power. The subsequent loss of this single power source would escalate the event to a Site Area Emergency in accordance with IC SS1, "Loss of All Offsite and Loss of All Onsite AC Power to Essential Busses."

The Threshold Values allow credit for operation of installed design features, such as cross-ties or swing diesels, provided that abnormal or emergency operating procedures address their use.

¶SU1

Initiating Condition

Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes.

Operating Mode Applicability:

Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1a **AND** 1b)

1. a. Loss of offsite power to **OR** from Start Up Transformers 1(2)A **AND** 1(2)B resulting in loss of all offsite electrical power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G for greater than 15 minutes

   AND

   b. Emergency diesel generators supplying power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G.

Basis:

Prolonged loss of Offsite AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Initiating Condition

Inability to Reach Required Shutdown Within Technical Specification Limits.

Operating Mode Applicability:

Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1)

1. Plant is **NOT** brought to required operating mode within FNP Technical Specifications LCO Action Statement Time limit.

Basis:

Limiting Conditions of Operation (LCOs) require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the site Technical Specifications requires a one hour report under 10 CFR 50.72 (b) Non-emergency events. The plant is within its safety envelope when being shut down within the allowable action statement time in the Technical Specifications. An immediate NOUE is required when the plant is not brought to the required operating mode within the allowable action statement time in the Technical Specifications. Declaration of a NOUE is based on the time at which the LCO-specified action statement time period elapses under the site Technical Specifications and is not related to how long a condition may have existed. Other required Technical Specification shutdowns that involve precursors to more serious events are addressed by other System Malfunction, Hazards, or Fission Product Barrier Degradation ICs.

¶SU3

Initiating Condition

UNPLANNED Loss of Most or All Safety System Annunciation or Indication in The Control Room for Greater Than 15 Minutes

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: (1)

1. UNPLANNED loss of most **OR** all (approximately 75% of the MCB annunciators) **OR** indicators associated with safety systems for greater than 15 minutes.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC and its associated Threshold Value are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

Recognition of the availability of computer based indication equipment is considered.

Quantification of "Most" is arbitrary, however, it is estimated that if approximately 75% of the safety system annunciators or indicators are lost, there is a greater risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions.

It is further recognized that most plant designs provide redundant safety system indication powered from separate uninterruptible power supplies. While failure of a large portion of annunciators is more likely than a failure of a large portion of indications, the concern is included in this Threshold Value due to difficulty associated with assessment of plant conditions.

The annunciators or indicators for this Threshold Value include those identified in the Abnormal Operating Procedures, in the Emergency Operating Procedures, and in other Threshold Values. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Initiating Condition

Fuel Clad Degradation.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Values: (1)

1. RCS coolant sample activity value indicating fuel clad degradation greater than Technical Specification allowable limits as indicated by ANY of the following:

Dose Equivalent I-131 greater than 0.5 µCi/gm for greater than 48 hours
Dose Equivalent I-131 greater than Technical Specification figure 3.4.16-1. **IF** less than 20% power, **THEN** use the Dose Equivalent I-131 20% power limit on Technical Specification figure 3.4.16-1
RCS gross specific activity greater than 100/Ē µCi/gm.

Basis:

This IC is included as a NOUE because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems.

The Threshold Value addresses coolant samples exceeding coolant technical specifications for iodine spike. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs. Though the referenced Technical Specification limits are mode dependent, it is appropriate that the Threshold Value's be applicable in all modes, as they indicate a potential degradation in the level of safety of the plant.

¶SU5

Initiating Condition

RCS Leakage.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Values: (1 **OR** 2)

1. RCS Unidentified **OR** pressure boundary leakage greater than 10 gpm.

2. RCS Identified leakage greater than 25 gpm.

Basis:

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The 10 gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through time-consuming surveillance tests (e.g., mass balances). The Threshold Value for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage.

¶SU6

Initiating Condition

UNPLANNED Loss of All Onsite **OR** Offsite Communications Capabilities.

Operating Mode Applicability: Power Operation (Mode 1)
Startup (Mode 2)
Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Values: (1 **OR** 2)

1. UNPLANNED loss of ALL of the following on-site communications capability affecting the ability to perform routine operations:

In plant telephones
Public Address System
Plant radio systems

2. UNPLANNED loss of ALL of the following off-site communications capability:

ENN (Emergency Notification Network)
ENS (Emergency Notification System)
Commercial phones (Radio, PBX, Satellite, Wireless)
VOIP (Voice Over Internet Protocol)
OPX (Off Premise Extension)

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

The purpose of this IC and its associated Threshold Values is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant conditions. This Threshold Value is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being used to make communications possible. The list for onsite communications loss encompasses the loss of all means of routine communications. The list for offsite communications loss encompasses the loss of all means of communications with offsite authorities.

¶SU8

Initiating Condition

Inadvertent Criticality.

OPERATING MODE APPLICABILITY Hot Standby (Mode 3)
Hot Shutdown (Mode 4)

Threshold Value: **(1)**

1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC addresses inadvertent criticality events. While the primary concern of this IC is criticality events that occur in Cold Shutdown or Refueling modes (NUREG 1449, Shutdown and Low-Power Operation at Commercial Nuclear Power Plants in the United States), the IC is applicable in other modes in which inadvertent criticalities are possible. This IC indicates a potential degradation of the level of safety of the plant, warranting a NOUE classification. This IC excludes inadvertent criticalities that occur during planned reactivity changes associated with reactor startups.

This condition is identified using the startup rate monitor. The term "sustained" is used in order to allow exclusion of expected short term positive startup rates from planned control rod movements. These short term positive startup rates are the result of the rise in neutron population due to subcritical multiplication.

HG1

Initiating Condition

HOSTILE ACTION Resulting in Loss Of Physical Control of the Facility.

Operating Mode Applicability: All

Threshold Value: (1)

1. A HOSTILE Action has occured such that plant personnel are unable to operate equipment required to maintain safety functions..

2. A HOSTILE ACTION has caused failure of Spent Fuel Cooling Systems and IMMINENT fuel damage is likely for a freshly off-loaded reactor core in pool.

Basis:

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

VITAL AREAS: any areas, normally within the PROTECTED AREA, that contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

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

IMMINENT: Mitigation actions have been ineffective, additional actions are not expected to be successful, and trended information indicates that the event or condition will occur.

This IC encompasses conditions under which a HOSTILE ACTION has resulted in a loss of physical control of VITAL AREAs (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location. These safety functions are reactivity control, RCS inventory, and secondary heat removal. If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the above initiating condition is not met.

Threshold Value 2 should also address loss of physical control of spent fuel pool cooling systems if imminent fuel damage is likely for a freshly off-loaded reactor core in pool). If the calculated SFP "time to boil" is 2 hours or less, spent fuel damage is likely.

Intentionally Left Blank

Initiating Condition

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of General Emergency.

Operating Mode Applicability: All

Threshold Value: (1)

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity **OR** HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area.

Basis:

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

This Threshold Value is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the General Emergency class.

Intentionally Left Blank

¶HS2

Initiating Condition

Control Room Evacuation Has Been Initiated **AND** Plant Control Cannot Be Established.

Operating Mode Applicability: All

Threshold Value: (1a **AND** 1b)

1. a. Control Room evacuation has been initiated

   AND

   b. Control of the plant can **NOT** be established per AOP-28.0, Control Room Inaccessibility, within 15 minutes.

Basis:

Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. The intent of this IC is to capture those events where control of the plant cannot be reestablished in a timely manner. The time for transfer is based on analysis or assessments as to how quickly control must be reestablished without core uncovering and/or core damage. The determination of whether or not control is established at the remote shutdown panel is based on Emergency Director (ED) judgment. The ED is expected to make a reasonable, informed judgment within the time for transfer that the operators have control of the plant.

The intent of the Threshold Value is to establish control of important plant equipment and knowledge of important plant parameters in a timely manner. Primary emphasis should be placed on those components and instruments that supply protection for and information about safety functions. These safety functions are reactivity control, RCS inventory, and secondary heat removal.

¶HS3

Initiating Condition

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of Site Area Emergency.

Operating Mode Applicability: All

Threshold Value: (1)

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

Basis:

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

This Threshold Value is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency class description for Site Area Emergency.

¶**HS4**

Initiating Condition

HOSTILE ACTION within the PROTECTED AREA

Operating Mode Applicability:All

Threshold Value: (1)

1. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the site security force..

Basis:

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

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

This class of security events represents an escalated threat to plant safety above that contained in the Alert IC in that a HOSTILE ACTION has progressed from the Owner Controlled Area to the Protected Area.

This EAL addresses the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. It is not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land or water attack elements.

The fact that the site is under serious attack with minimal time available for further preparation or additional assistance to arrive requires Offsite Response Organizations readiness and preparation for the implementation of protective measures.

This EAL addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the PROTECTED AREA. Those events are adequately addressed by other EALs.

Escalation of this emergency classification level, if appropriate, would be based on actual plant status after impact or progression of attack.

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¶HA1

Initiating Condition

Natural and Destructive Phenomena Affecting the Plant VITAL AREA.

Operating Mode Applicability: All

Threshold Values: (1, **OR** 2, **OR** 3, **OR** 4, **OR** 5, **OR** 6)

1. A felt earthquake validated in accordance with FNP-1-ARP-1.12, LOCATION MK5 indicates Seismic event greater than Operating Basis Earthquake (OBE).

2. Tornado **OR** high winds greater than 115 mph within the PROTECTED AREA boundary **AND** resulting in VISIBLE DAMAGE to any of the following plant structures/equipment **OR** the Control Room has indication of degraded performance of any listed systems:

Containment	Auxiliary Building
Service Water Intake Structure (SWIS)	Service Water Pond
Refueling Water Storage Tank (RWST)	Condensate Storage Tank (CST)
Diesel Generator Building	

3. Vehicle crash within PROTECTED AREA boundary **AND** resulting in VISIBLE DAMAGE to any of the following plant structures **OR** equipment therein **OR** Control Room has indication of degraded performance of those systems:

Containment	Auxiliary Building
Service Water Intake Structure (SWIS)	Service Water Pond
Refueling Water Storage Tank (RWST)	Condensate Storage Tank (CST)
Diesel Generator Building	

4. Turbine failure-generated missiles result in any VISIBLE DAMAGE to **OR** penetration of any of the following plant areas containing safety-related equipment, their controls **OR** their power supplies.

Containment	Auxiliary Building
Refueling Water Storage Tank (RWST)	Condensate Storage Tank (CST)
Diesel Generator Building	Control Room

5. Uncontrolled flooding in the following areas that results in degraded safety system performance as indicated in the control room **OR** that creates industrial safety hazards (e.g., electric shock) that precludes access necessary to operate **OR** monitor safety equipment.

Service Water Intake Structure (SWIS)
Auxiliary Building
Turbine Building Basement

6. Sustained hurricane winds greater than 74 mph onsite resulting in VISIBLE DAMAGE to plant structures within the PROTECTED AREA boundary containing equipment necessary for safe shutdown, or has caused damage as evidenced by control room indication of degraded performance of those systems

¶

Basis:

PROTECTED AREA: the area which normally encompasses all controlled areas within the security protected area fence.

VISIBLE DAMAGE: is damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

The Threshold Values in this IC escalate from the NOUE Threshold Values in HU1 in that the occurrence of the event has resulted in VISIBLE DAMAGE to plant structures or areas containing equipment necessary for a safe shutdown, or has caused damage to the safety systems in those structures evidenced by control indications of degraded system response or performance. The occurrence of VISIBLE DAMAGE and/or degraded system response is intended to discriminate against lesser events. The initial "report" should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this Threshold Value to assess the actual magnitude of the damage. The significance here is not that a particular system or structure was damaged, but rather, that the event was of sufficient magnitude to cause this degradation.

Threshold Value #1 is based on the OBE earthquake FSAR design basis. Seismic events of this magnitude can result in a plant VITAL AREA being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems.

Threshold Value #2 is based on the FSAR design basis. Wind loads greater than 115 mph can cause damage to safety functions and is read from the plant meteorological tower which reads up to 150 mph.

Threshold Value #3 addresses crashes of vehicle types large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant.

Threshold Value #4 addresses the threat to safety related equipment imposed by missiles generated by main turbine rotating component failures. This list of areas include areas containing safety-related equipment, their controls, and their power supplies. This Threshold Value is, therefore, consistent with the definition of an ALERT in that if missiles have damaged or penetrated areas containing safety-related equipment the potential exists for substantial degradation of the level of safety of the plant.

Threshold Value #5 addresses the effect of internal flooding that has resulted in degraded performance of systems affected by the flooding, or has created industrial safety hazards (e.g., electrical shock) that preclude necessary access to operate or monitor safety equipment. The inability to operate or monitor safety equipment represents a potential for substantial degradation of the level of safety of the plant. This flooding may have been caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. TS-PSA-001, Table 3.3.6-4 provides that the SWIS is vulnerable due to failure of the cooling water lines or discharge expansion joints. The Auxiliary Building is vulnerable due to failure of the Service Water piping. The Turbine Building basement is vulnerable to Circulating Water line breaks. The areas include those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged.

Threshold Value #6 covers site-specific phenomena of a hurricane. The Threshold Value is based on damage attributable to the wind.

¶HA2

Initiating Condition

FIRE **OR** EXPLOSION Affecting the Operability of Plant Safety Systems Required to Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

Threshold Value: (1)

1. FIRE **OR** EXPLOSION **AND** affected system parameter indications show degraded performance **OR** plant personnel report VISIBLE DAMAGE to permanent structures **OR** safety related equipment in any of the following VITAL AREAs

Containment	Auxiliary Building
Service Water Intake Structure (SWIS)	Service Water Pond
Storage Pond Dam and Dike	Pond Spillway Structure
Refueling Water Storage Tank (RWST)	Condensate Storage Tank (CST)
Diesel Generator Building	Control Room

Basis:

FIRE: is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute FIREs. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

EXPLOSION: is a rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

VITAL AREA: any area, normally within the PROTECTED AREA, which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

VISIBLE DAMAGE: is damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

The areas listed contain functions and systems required for the safe shutdown of the plant to determine if the FIRE or EXPLOSION is potentially affecting any redundant trains of safety systems.

This Threshold Value addresses a FIRE / EXPLOSION and not the degradation in performance of affected systems. The reference to damage of systems is used to identify the magnitude of the FIRE / EXPLOSION and to discriminate against minor FIREs / EXPLOSIONs. The significance here is not that a safety system was degraded but the fact that the FIRE / EXPLOSION was large enough to cause damage to these systems. Thus, the designation of a single train was intentional and is appropriate when the FIRE / EXPLOSION is large enough to affect more than one component.

The inclusion of a "report of VISIBLE DAMAGE" should not be interpreted as mandating a lengthy damage assessment prior to classification. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The Emergency Director also needs to consider any security aspects of the EXPLOSIONs, if applicable.

Initiating Condition

Release of Toxic, Asphyxiant or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Maintain Safe Operations or Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2)

1. Report **OR** detection of toxic **OR** asphyxiant gas within **OR** contiguous to a VITAL AREA in concentrations that may result in an atmosphere IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).

2. Report **OR** detection of flammable gases in concentration greater than the LOWER FLAMMABILITY LIMIT within **OR** contiguous to a VITAL AREA.

Basis:

VITAL AREA: any area, normally within the PROTECTED AREA, which contains equipment, systems, components, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation.

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH): A condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants which are likely to have adverse delayed effects on health.

LOWER FLAMMABILITY LIMIT (LFL): The minimum concentration of a combustible substance that is capable of propagating a flame through a homogenous mixture of the combustible and a gaseous oxidizer.

CONTIGUOUS: being in actual contact: touching along a boundary or at a point.

This IC is based on gases that affect the safe operation of the plant. This IC applies to buildings and areas contiguous to plant VITAL AREAs or other significant buildings or areas (i.e., service water pump house). The intent of this IC is not to include buildings (e.g., warehouses) or other areas that are not contiguous or immediately adjacent to plant VITAL AREAs.

Threshold Value #1 is met if measurement of toxic gas concentration results in an atmosphere that is IDLH within a VITAL AREA or any area or building contiguous to VITAL AREA. Exposure to an IDLH atmosphere will result in immediate harm to unprotected personnel, and would preclude access to any such affected areas.

Threshold Value #2 is met when the flammable gas concentration in a VITAL AREA or any building or area contiguous to a VITAL AREA exceed the LOWER FLAMMABILITY LIMIT. This Threshold Value addresses concentrations at which gases can ignite/support combustion. An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Once it has been determined that an uncontrolled release is occurring, then sampling must be done to determine if the concentration of the released gas is within this range.

Initiating Condition

HOSTILE ACTION within the OWNER CONTROLLED AREA or Airborne Attack Threat.

Operating Mode Applicability: All

Threshold Values: (1 <u>OR</u> 2)

1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLED AREA as reported by the security shift supervision.

2. A validated notification from NRC of an airliner attack threat within 30 minutes of the site.

Basis:

Note: Timely and accurate communication between Security Shift Supervision and the Control Room is crucial for the implementation of effective Security EALs.

These EALs address the contingency for a very rapid progression of events, such as that experienced on September 11, 2001. They are not premised solely on the potential for a radiological release. Rather the issue includes the need for rapid assistance due to the possibility for significant and indeterminate damage from additional air, land, or water attack elements.

The fact that the site is under serious attack or is an identified attack target with minimal time available for further preparation or additional assistance to arrive requires a heightened state of readiness and implementation of protective measures that can be effective (such as on-site evacuation, dispersal, or sheltering).

Threshold 1 addresses the potential for a very rapid progression of events due to a HOSTILE ACTION. It is not intended to address incidents that are accidental events or acts of civil disobedience, such as small aircraft impact, hunters, or physical disputes between employees within the OCA. Those events are adequately addressed by other EALs.

Threshold 2 addresses the immediacy of an expected threat arrival or impact on the site within a relatively short time.

The intent of this EAL is to ensure that notifications for the airliner attack threat are made in a timely manner and that Offsite Response Organizations and plant personnel are at a state of heightened awareness regarding the credible threat. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant.

This EAL is met when a plant receives information regarding an airliner attack threat from NRC and the airliner is within 30 minutes of the plant. Only the plant to which the specific threat is made need declare the Alert.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant). The status and size of the plane may be provided by NORAD through the NRC.

¶HA5

Initiating Condition

Control Room Evacuation Has Been Initiated.

Operating Mode Applicability: All

Threshold Value: (1)

1. Entry into AOP-28.0, Control Room Inaccessibility, for Control Room evacuation.

Basis:

With the control room evacuated, additional support, monitoring and direction through the Technical Support Center and/or other emergency response facility is necessary. Inability to establish plant control from outside the control room will escalate this event to a Site Area Emergency.

¶HA6

Initiating Condition

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of an Alert.

Operating Mode Applicability: All

Threshold Value: (1)

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process **OR** have occurred which involve actual **OR** likely potential substantial degradation of the level of safety of the plant **OR** a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.

Basis:

HOSTILE ACTION - An act toward a Nuclear Power Plant (NPP) or its personnel that includes the use of violent force to destroy equipment, take hostages, and /or intimidate the licensee to achieve an end. This includes attack by air, land, or water using weapons, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the NPP. Non-terrorism-based Threshold Values should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area.)

This Threshold Value is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

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¶HU1

Initiating Condition

Natural and Destructive Phenomena Affecting the PROTECTED AREA.

Operating Mode Applicability: All

Threshold Value: (1 **OR** 2 **OR** 3 **OR** 4 **OR** 5 **OR** 6 **OR** 7)

1. A felt earthquake validated in accordance with FNP-1-ARP-1.12, LOCATION MK5.

2. Report by plant personnel of tornado **OR** high winds greater than 115 mph striking within the PROTECTED AREA boundary.

3. Crash of vehicle, large enough to cause significant damage, into plant structures containing functions or systems required for safe shutdown within the PROTECTED AREA boundary.

4. Report by plant personnel of an unanticipated EXPLOSION within the PROTECTED AREA boundary resulting in VISIBLE DAMAGE to permanent structures **OR** equipment.

5. Report of turbine failure resulting in casing penetration **OR** damage to turbine **OR** generator seals.

6. Uncontrolled flooding in the following areas:

Service Water Intake Structure (SWIS)
Auxiliary Building
Turbine Building Basement

7. Sustained hurricane force winds greater than 74 mph forecast to be at the plant site in the next four hours in accordance with FNP-0-AOP-21.0.

Basis:

PROTECTED AREA: the area which normally encompasses all controlled areas within the security protected area fence.

EXPLOSION: is a rapid, violent, unconfined combustion, or catastrophic failure of pressurized equipment that imparts energy of sufficient force to potentially damage permanent structures, systems, or components.

VISIBLE DAMAGE: is damage to equipment or structure that is readily observable without measurements, testing, or analysis. Damage is sufficient to cause concern regarding the continued operability or reliability of affected safety structure, system, or component. Example damage includes: deformation due to heat or impact, denting, penetration, rupture, cracking, paint blistering. Surface blemishes (e.g., paint chipping, scratches) should not be included.

These ICs are categorized on the basis of the occurrence of an event of sufficient magnitude to be of concern to plant operators. Areas identified in the Threshold Values define the location of the event based on the potential for damage to equipment contained therein.

Threshold Value #1 - As defined in the EPRI-sponsored "Guidelines for Nuclear Plant Response to an Earthquake", dated October 1989, a *"felt earthquake"* is:

> An earthquake of sufficient intensity such that: (a) the vibratory ground motion is felt at the nuclear plant site and recognized as an earthquake based on a consensus of control room operators on duty at the time, and (b) for plants with operable seismic instrumentation, the seismic switches of the plant are activated. For most plants with seismic instrumentation, the seismic switches are set at an acceleration of about 0.01g.

Threshold Value #2 is based on the assumption that a tornado striking (touching down) or high winds within the PROTECTED AREA may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. The high wind 115 mph value is based on FSAR design basis. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

Threshold Value #3 addresses crashes of vehicle types large enough to cause significant damage to plant structures containing functions and systems required for safe shutdown of the plant.

For Threshold Value #4 only those EXPLOSIONs of sufficient force to damage permanent structures or equipment within the PROTECTED AREA should be considered. No attempt is made in this Threshold Value to assess the actual magnitude of the damage. The occurrence of the EXPLOSION with reports of evidence of damage is sufficient for declaration. The Emergency director also needs to consider any security aspects of the EXPLOSION, if applicable.

Threshold Value #5 addresses main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Generator seal damage observed after generator purge does not meet the intent of this Threshold Value because it did not impact normal operation of the plant. This Threshold Value is consistent with the definition of a NOUE while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment.

Threshold Value #6 addresses the effect of flooding caused by internal events such as component failures, equipment misalignment, or outage activity mishaps. The areas included are those areas that contain systems required for safe shutdown of the plant, that are not designed to be wetted or submerged. TS-PSA-001, Table 3.3.6-4 provides that the SWIS is vulnerable due to failure of the cooling water lines or discharge expansion joints. The Auxiliary Building is vulnerable due to failure of the Service Water piping. The Turbine Building basement is vulnerable to Circulating Water line breaks causing loss of Service Air. Escalation of the emergency classification is based on the damage caused or by access restrictions that prevent necessary plant operations or systems monitoring.

Threshold Value #7 covers site-specific phenomena of the hurricane based on the severe weather mitigation procedure.

¶HU2

Initiating Condition

FIRE Within PROTECTED AREA Boundary Not Extinguished Within 15 Minutes of Detection.

Operating Mode Applicability: All

Threshold Value: (1)

NOTE: A fire alarm can be disproved by personnel observation of the affected area, or by resetting the PYRO panel for that alarm or for a containment fire alarm performing appropriate steps of FNP-1(2)-ARP-1.12, (MH1).

1. FIRE in buildings **OR** areas contiguous to any of the following areas **NOT** extinguished within 15 minutes of control room notification **OR** control room alarm unless disproved by personnel observation within 15 minutes of the alarm:

Containment
Service Water Intake Structure (SWIS)
Auxiliary Building
Refueling Water Storage Tank (RWST)
Diesel Generator Building
Condensate Storage Tank (CST)
Control Room

Basis:

FIRE: is combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute FIREs. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

CONTIGUOUS: being in actual contact: touching along a boundary or at a point.

PROTECTED AREA: the area which normally encompasses all controlled areas within the security protected area fence.

CONTIGUOUS: being in actual contact: touching along a boundary or at a point.

The purpose of this IC is to address the magnitude and extent of FIREs that may be potentially significant precursors to damage to safety systems. As used here, *Detection* is visual observation and report by plant personnel or sensor alarm indication.

The 15 minute time period begins with a credible notification that a FIRE is occurring, or indication of a VALID fire detection system alarm. Verification of a fire detection system alarm includes actions that can be taken with the control room or other nearby site-specific location to ensure that the alarm is not spurious. The alarm can be determined to be spurious if it can be reset on the Pyro Panel. A verified alarm is assumed to be an indication of a FIRE unless it is disproved within the 15 minute period by personnel dispatched to the scene. In other words, a personnel report from the scene may be used to disprove a sensor alarm if received within 15 minutes of the alarm, but shall not be required to verify the alarm.

The intent of this 15 minute duration is to size the FIRE and to discriminate against small FIREs that are readily extinguished (e.g., smoldering waste paper basket). The site-specific list should be limited and applies to buildings and areas contiguous to plant VITAL AREAs or other significant buildings or areas.

Initiating Condition

Release of Toxic, Asphyxiant, or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.

Operating Mode Applicability: All

Threshold Values: (1 **OR** 2)

1. Report **OR** detection of toxic, asphyxiant, **OR** flammable gas that has **OR** could enter the Owner Controlled Area in amounts greater than life threatening **OR** flammable concentrations that can affect NORMAL PLANT OPERATIONS.

2. Report by Local, County, **OR** State Officials for evacuation **OR** sheltering of site personnel based on an offsite toxic, asphyxiant, **OR** flammable gas event.

Basis:

NORMAL PLANT OPERATIONS: activities at the plant site associated with routine testing, maintenance, or equipment operations, in accordance with normal operating or administrative procedures. Entry into abnormal or emergency operating procedures, or deviation from normal security or radiological controls posture, is a departure from NORMAL PLANT OPERATIONs.

This IC is based on the existence of uncontrolled releases of toxic, asphyxiant, or flammable gas that may enter the Owner Controlled Area and affect normal plant operations. It is intended that releases of toxic or flammable gases are of sufficient quantity, and the release point of such gases is such that normal plant operations would be affected. Offsite events are included through a warning by local officials as the resultant affect on NORMAL PLANT OPERATIONS would be the same. This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation. The Threshold Values are not intended to require significant assessment or quantification. The IC assumes an uncontrolled process that has the potential to affect plant operations, or personnel safety.

Initiating Condition

Confirmed SECURITY CONDITION Which Indicates a Potential Degradation in the Level of Safety of the Plant.

Operating Mode Applicability: All

Threshold Values: (1 OR 2 OR 3)

1. A SECURITY CONDITION that does NOT involve a HOSTILE ACTION as reported by security shift supervision.
2. A CREDIBLE FNP security THREAT notification.
3. A validated notification from NRC providing information of an aircraft threat.

Basis:

Note: Timely and accurate communication between Security Shift Supervision and the Control Room is crucial for the implementation of effective Security EALs.

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

CREDIBLE THREAT: A threat is considered credible through use of FNP-0-SP-37, Threat Assessment and Security Force Protection Recommendations.

Security events which do not represent a potential degradation in the level of safety of the plant are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Security events assessed as HOSTILE ACTIONS are classifiable under HA4, HS4 and HG1.

A higher initial classification could be made based upon the nature and timing of the security threat and potential consequences. The licensee shall consider upgrading the emergency response status and emergency classification level in accordance with the site's Safeguards Contingency Plan and Emergency Plan.

In Threshold #1 reference is made to security shift supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant FNP Safeguards Contingency Plan.

This threshold is based on site specific security plans. Site specific Safeguards Contingency Plans are based on guidance provided by NEI 03-12.

The intent of Threshold Value 2 is to ensure that appropriate notifications for the security threat are made in a timely manner. This includes information of a CREDIBLE THREAT. Only the plant to which the specific threat is made need declare the Notification of an Unusual Event.

The intent of Threshold Value 3 is to ensure that notifications for the security threat are made in a timely manner and that Offsite Response Organizations and plant personnel are at a state of heightened awareness regarding the credible threat. It is not the intent of this EAL to replace existing non-hostile related EALs involving aircraft.

This Threshold Value is met when a plant receives information regarding an aircraft threat from NRC. Validation is performed by calling the NRC or by other approved methods of authentication. Only the plant to which the specific threat is made need declare the Unusual Event.

The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant). The status and size of the plane may be provided by NORAD through the NRC.

Escalation to Alert emergency classification level would be via HA4 would be appropriate if the threat involves an airliner within 30 minutes of the plant.

A higher initial classification could be made based upon the nature and timing of the threat and potential consequences. The Emergency Director shall consider upgrading the emergency response status and emergency classification in accordance with the FNP Safeguards Contingency Plan and Emergency Plan implementing Procedures.

Initiating Condition

Other Conditions Existing Which in the Judgment of the Emergency Director Warrant Declaration of a NOUE.

Operating Mode Applicability: All

Threshold Value: (1)

1. Other conditions exist which in the judgment of the Emergency Director indicate that events are in process **OR** have occurred which indicate a potential degradation of the level of safety of the plant **OR** indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response **OR** monitoring are expected unless further degradation of safety systems occurs.

Basis:

This Threshold Value is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the NOUE emergency class.

From a broad perspective, one area that may warrant Emergency Director judgment is related to likely or actual breakdown of site-specific event mitigating actions. Examples to consider include inadequate emergency response procedures, transient response either unexpected or not understood, failure or unavailability of emergency systems during an accident in excess of that assumed in accident analysis, or insufficient availability of equipment and/or support personnel.

¶E-HU1

Initiating Condition

Damage to a loaded cask CONFINEMENT BOUNDARY.

Operating Mode Applicability: Not applicable

Threshold Value: (1)

1. Damage to a loaded dry fuel storage cask CONFINEMENT BOUNDARY due to natural phenomena events, accident conditions **OR** any condition in the opinion of the Emergency Director that affects **OR** causes a loss of loaded dry fuel storage cask CONFINEMENT BOUNDARY.

Basis:

CONFINEMENT BOUNDARY: is the barrier(s) between areas containing radioactive substances and the environment.

A NOUE in this IC is categorized on the basis of the occurrence of an event of sufficient magnitude that a loaded cask CONFINEMENT BOUNDARY is damaged or violated. This includes classification based on a loaded fuel storage cask CONFINEMENT BOUNDARY loss leading to the degradation of the fuel during storage or posing an operational safety problem with respect to its removal from storage.

Any condition, which, in the judgment of the Emergency Director, is a potential degradation in the level of safety of the ISFSI. Emergency Director judgment is to be based on known conditions and the expected response to mitigating activities within a short time period.

CG1

Initiating Condition

Loss of RPV Inventory Affecting Fuel Clad Integrity with Containment Challenged with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1 **AND** 2 **AND** 3)

1. Loss of RPV inventory as indicated by ANY of the following:

Unexplained Containment sump level rise
Unexplained Reactor Coolant Drain Tank (RCDT) level rise
Unexplained Waste Holdup Tank (WHT) level rise

AND

2. RPV Level:
   a. Less than elevation 118' (Top of Active Fuel) for greater than 30 minutes
   OR
   b. RPV level **CANNOT** be monitored **WITH** indication of core uncovery for greater than 30 minutes as evidenced by ANY of the following:

Incore Seal Table RE7	greater than 450 mR/hr
Erratic Source Range Monitor Indication	

AND

3. Containment challenged as indicated by ANY of the following:

Explosive mixture inside containment	greater than **OR** equal to 6% H_2
Pressure	greater than **OR** equal to 5 psig **WITH** CONTAINMENT CLOSURE established
	greater than **OR** equal to 54 psig **WITH** Tech Spec containment integrity intact
CONTAINMENT CLOSURE **NOT** established	

Basis:

CONTAINMENT CLOSURE: per FNP-1-STP-18.4, "Containment Integrity Verification and Closure".

For Threshold Value 1 in the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

For Threshold Value 1 in the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed to assure that the ability to monitor level will not be interrupted. However, if all level indication were to be lost during a loss of

RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. For both cold shutdown and refueling modes sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

Threshold Value 2 represents the inability to restore and maintain RPV level to above the top of active fuel. Fuel damage is probable if RPV level cannot be restored, as available decay heat will cause boiling, further reducing the RPV level.

Analysis in appropriate references indicates that core damage may occur within an hour following continued core uncovery therefore, conservatively, 30 minutes was chosen.

The GE is declared on the occurrence of the loss or imminent loss of function of all three barriers. Based on the above discussion, RCS barrier failure resulting in core uncovery for 30 minutes or more may cause fuel clad failure. With the CONTAINMENT breached or challenged then the potential for unmonitored fission product release to the environment is high. This represents a direct path for radioactive inventory to be released to the environment. This is consistent with the definition of a GE.

In the context of Threshold Value 3, CONTAINMENT CLOSURE is the action taken to secure containment and its associated structures, systems, and components as a functional barrier to fission product release under existing plant conditions. If the closure is re-established prior to exceeding the temperature or level thresholds of the RCS Barrier and Fuel Clad Barrier Threshold Values, escalation to GE would not occur.

The site-specific pressure at which CONTAINMENT is considered challenged may change based on the condition of the CONTAINMENT. If the Unit is in the cold shutdown mode and the CONTAINMENT is fully intact then the site-specific setpoint is the CONTAINMENT design pressure (54 psig). This is consistent with typical owner's groups Emergency Response Procedures. With CONTAINMENT CLOSURE established intentionally by the plant staff in preparations for inspection, maintenance, or refueling the setpoint is based on the penetration seals design of 5 psig.

In the early stages of a core uncovery event, it is unlikely that hydrogen buildup due to a core uncovery could result in an explosive mixture of dissolved gasses in CONTAINMENT. However, CONTAINMENT monitoring and/or sampling should be performed to verify this assumption and a General Emergency declared if it is determined that an explosive mixture exists.

Initiating Condition

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability.

Operating Mode Applicability: Cold Shutdown (Mode 5)

Threshold Values: (1 **OR** 2)

1. Loss of Reactor Pressure Vessel (RPV) inventory affecting core decay heat removal capability with CONTAINMENT CLOSURE **NOT** established as indicated by:

   a. RPV level less than 121' (6" below Bottom ID of RCS loop)
   OR
   b. RPV level **CANNOT** be monitored for greater than 30 minutes with a possible loss of RPV inventory as indicated by unexplained level rise in any of the following:

Containment sump
Reactor Coolant Drain Tank (RCDT)
Waste Holdup Tank (WHT)

2. Loss of RPV inventory affecting core decay heat removal capability with CONTAINMENT CLOSURE established as indicated by:

   a. RPV level less than 118' (Top of Active Fuel (TOAF))
   OR
   b. RPV level **CANNOT** be monitored for greater than 30 minutes with a possible loss of RPV inventory as indicated by ANY of the following:

Containment sump level rise
Unexplained Reactor Coolant Drain Tank (RCDT) level rise
Unexplained Waste Holdup Tank (WHT) level rise
Erratic Source Range monitor indication

Basis:

CONTAINMENT CLOSURE: per FNP-1-STP-18.4, Containment Integrity Verification and Closure".

Under the conditions specified by this IC, continued lowering in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach, pressure boundary leakage, or continued boiling in the RPV.

In the cold shutdown mode, normal RCS level and reactor vessel level indication systems (RVLIS) will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

The 30 minute duration allows sufficient time for actions to be performed to recover needed cooling equipment. The effluent release path is not expected with closure established.

Initiating Condition

Loss of RPV Inventory Affecting Core Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling (Mode 6)

Threshold Values: (1 **OR** 2)

1. **WITH** CONTAINMENT CLOSURE **NOT** established:

   a. RPV level less than elevation 121' (6" below Bottom ID of RCS loop).

   OR

   b. RPV level **CANNOT** be monitored **WITH** indication of core uncovery as evidenced by ANY of the following:

Incore Seal Table R7 greater than 6.5 mR/hr
Erratic Source Range Monitor Indication

2. **WITH** CONTAINMENT CLOSURE established

   a. RPV level less than elevation 118' (Top of Active Fuel).

   OR

   b. RPV level **CANNOT** be monitored **WITH** Indication of core uncovery as evidenced by ANY of the following:

Containment High Range Radiation Monitor R27 A **OR** B greater than 390 R/hr
Incore Seal Table R7 greater than 450 mR/hr
Erratic Source Range Monitor Indication

Basis:

CONTAINMENT CLOSURE: per FNP-1-STP-18.4, Containment Integrity Verification and Closure".

Under the conditions specified by this IC, continued lowering in RPV level is indicative of a loss of inventory control. Inventory loss may be due to an RPV breach or continued boiling in the RPV.

As water level in the RPV lowers, the dose rate above the core will rise. The dose rate due to this core shine should result in up-scaled Containment High Range Monitor indication and possible alarm. Additionally, post-TMI studies indicated that the installed nuclear instrumentation will operate erratically when the core is uncovered and that this should be used as a tool for making such determinations.

For Threshold Value 2 in the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed (including the ability to monitor level visually) to assure that the ability to monitor level will not be interrupted.

This effluent release is not expected with closure established.

¶CA1

Initiating Condition

Loss of RCS Inventory.

Operating Mode Applicability: Cold Shutdown (Mode 5)

Threshold Values: (1 **OR** 2)

1. Loss of RCS inventory as indicated by RPV level less than 121' 6" (bottom ID of RCS loop)
2. a. RCS level **CANNOT** be monitored for greater than 15 minutes

   AND

   b. A possible loss of RCS inventory may be occurring as indicated by unexplained level rise in ANY of the following:

Containment sump
Reactor Coolant Drain Tank (RCDT)
Waste Holdup Tank (WHT)

Basis:

These Threshold Values serve as precursors to a loss of ability to adequately cool the fuel. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level lowering and potential core uncovery.

The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems has occurred. The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

In the cold shutdown mode, normal RCS level and RPV level instrumentation systems will normally be available. However, if all level indication were to be lost during a loss of RCS inventory event, the operators would need to determine that RPV inventory loss was occurring by observing sump and tank level changes. Sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration for the loss of level indication was chosen because it is half of the CS1 Site Area Emergency Threshold Value duration.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

Initiating Condition

Loss of RPV Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling (Mode 6)

Threshold Values: (1 OR 2)

1. Loss of inventory as indicated by RPV level less than 121' 6" (bottom ID of RCS loop)
2. a. RPV level **CANNOT** be monitored for greater than 15 minutes

   AND

   b. A possible loss of RCS inventory may be occurring as indicated by unexplained level rise in ANY of the following:

Containment sump
Reactor Coolant Drain Tank (RCDT)
Waste Holdup Tank (WHT)

Basis:

These Threshold Values serve as precursors to a loss of heat removal. The magnitude of this loss of water indicates that makeup systems have not been effective and may not be capable of preventing further RPV level lowering and potential core uncovery. This condition will result in a minimum classification of Alert.

The Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems may occur. The inability to restore and maintain level after reaching this setpoint would therefore be indicative of a failure of the RCS barrier.

In the refueling mode, normal means of RPV level indication may not be available. Redundant means of RPV level indication will be normally installed to assure that the ability to monitor level will not be interrupted. Sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage. The 15-minute duration allows CA2 to be an effective precursor to CS2.

The difference between CA1 and CA2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

¶CA3

Initiating Condition

Loss of All Offsite Power **AND** Loss of All Onsite AC Power to Essential Busses.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)
Defueled

Threshold Value:

1. a. Loss of offsite power to **OR** from Start Up Transformers 1(2)A **AND** 1(2)B resulting in loss of all offsite electrical power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G

   AND

   b. Failure of emergency diesel generators to supply power to emergency busses.

   AND

   c. Failure to restore power to at least one emergency bus within 15 minutes from the time of loss of both offsite and onsite AC power.

Basis:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal, Spent Fuel Heat Removal and the Ultimate Heat Sink. When in cold shutdown, refueling, or defueled mode the event can be classified as an Alert, because of the significantly reduced decay heat, lower temperature and pressure, increasing the time to restore one of the emergency busses. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Consideration should be given to operable loads necessary to remove decay heat or provide Reactor Vessel makeup capability when evaluating loss of AC power to essential busses. Even though an essential bus may be energized, if necessary loads (i.e., loads that if lost would inhibit decay heat removal capability or Reactor Vessel makeup capability) are not operable on the energized bus then the bus should not be considered operable.

Initiating Condition

Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1 **OR** 2 **OR** 3)

1. An UNPLANNED event results in RCS temperature exceeding 200°F with:
   a. CONTAINMENT CLOSURE **NOT** established
   AND
   b. RCS integrity **NOT** established

NOTE 1	**The Emergency Director should not wait until the indicated time of Threshold Values 2 or 3 has elapsed, but should declare the event as soon as it is determined that the duration has or will likely be exceeded.**
NOTE 2	**If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced then Threshold Values 2 and 3 are not applicable**

2. An UNPLANNED event results in RCS temperature exceeding 200°F for greater than 20 minutes (Note) with:
   a. CONTAINMENT CLOSURE established
   AND
   b. RCS integrity **NOT** established
   OR
   c. RCS inventory reduced.

3. An UNPLANNED event results in:
   a. RCS temperature exceeding 200°F for greater than 60 minutes (Note)
   OR
   b. RCS pressure increasing greater than 10 psig

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

CONTAINMENT CLOSURE: per FNP-1-STP-18.4, "Containment Integrity Verification and Closure".

Threshold Value 1 addresses complete loss of functions required for core cooling during refueling and cold shutdown modes when neither CONTAINMENT CLOSURE nor RCS integrity are established. RCS integrity is in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). No delay time is allowed for

Threshold Value1 because the evaporated reactor coolant that may be released into the Containment during this heatup condition could also be directly released to the environment.

Threshold Value 2 addresses the complete loss of functions required for core cooling for greater than 20 minutes during refueling and cold shutdown modes when CONTAINMENT CLOSURE is established but RCS integrity is not established or RCS inventory is reduced. As in Threshold Value 1, RCS integrity should be assumed to be in place when the RCS pressure boundary is in its normal condition for the cold shutdown mode of operation (e.g., no freeze seals or nozzle dams). The allowed 20 minute time frame was included to allow operator action to restore the heat removal function, if possible.

Threshold Value 3 addresses complete loss of functions required for core cooling for greater than 60 minutes during refueling and cold shutdown modes when RCS integrity is established. The status of CONTAINMENT CLOSURE in this Threshold Value is immaterial given that the RCS is providing a high pressure barrier to fission product release to the environment. The 60 minute time frame should allow sufficient time to restore cooling without there being a substantial degradation in plant safety. The 10 psig pressure rise covers situations where, due to high decay heat loads, the time provided to restore temperature control, should be less than 60 minutes.

The Emergency Director must remain alert to events or conditions that lead to the conclusion that exceeding the Threshold Value is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

Initiating Condition

RCS Leakage.

Operating Mode Applicability: Cold Shutdown (Mode 5)

Threshold Values:

1. Unable to establish or maintain pressurizer level greater than 15%.

Basis:

This IC is included as a NOUE because it is considered to be a potential degradation of the level of safety of the plant. The inability to establish and maintain level is indicative of loss of RCS inventory. Prolonged loss of RCS Inventory may result in escalation to the Alert level via either IC CA1 (Loss of RCS) or CA4 (Inability to Maintain Plant in Cold Shutdown with Irradiated Fuel in the RPV).

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling mode applicability. In cold shutdown the RCS will normally be intact and RCS inventory and level monitoring means such as Pressurizer level indication and makeup volume control tank levels are normally available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

¶CU2

Initiating Condition

UNPLANNED Loss of RCS Inventory with Irradiated Fuel in the RPV.

Operating Mode Applicability: Refueling (Mode 6)

Threshold Values: (1 **OR** 2)

1. UNPLANNED RCS level lowering below 129' (RPV flange) for greater than **OR** equal to 15 minutes

2. a. RPV level **CANNOT** be monitored

   AND

   b. A possible loss of RPV inventory may be occurring as indicated by unexplained level rise in ANY of the following:

Containment sump
Reactor Coolant Drain Tank (RCDT)
Waste Holdup Tank (WHT)

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. Refueling evolutions that lower RCS water level below the RPV flange are carefully planned and procedurally controlled. An UNPLANNED event that results in water level decreasing below the RPV flange warrants declaration of a NOUE due to the reduced RCS inventory that is available to keep the core covered. The allowance of 15 minutes was chosen because it is reasonable to assume that level can be restored within this time frame using any of the redundant means of refill that should be available.

The difference between CU1 and CU2 deals with the RCS conditions that exist between cold shutdown and refueling modes. In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available. In the refueling mode the RCS is not intact and RPV level and inventory are monitored by different means.

In the refueling mode, normal means of core temperature indication and RCS level indication may not be available. Redundant means of RPV level indication will normally be installed to assure that the ability to monitor level will not be interrupted. Sump and tank level rises must be evaluated against other potential sources of leakage such as cooling water sources inside the containment to ensure they are indicative of RCS leakage.

Threshold Value 1 involves a lowering in RCS level below the top of the RPV flange that continues for 15 minutes due to an UNPLANNED event.

Initiating Condition

Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

NOTE: **A NOUE should not be made for pre-planned testing such as SI/LOSP testing.**

Threshold Value:

1. a. Loss of offsite power to **OR** from Start Up Transformers 1(2)A **AND** 1(2)B resulting in loss of all offsite electrical power to **BOTH** 4160V ESF busses 1(2)F **AND** 1(2)G for greater than 15 minutes

   AND

   b. At least one emergency diesel generator supplying power to **EITHER** 4160V ESF buss 1(2)F **OR** 1(2)G.

Basis:

Prolonged loss of AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (e.g., Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

¶

Initiating Condition

UNPLANNED Loss of Decay Heat Removal Capability with Irradiated Fuel in the RPV.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1 OR 2)

NOTE: The Emergency Director should not wait until 15 minutes has elapsed, but should declare the event as soon as it is determined that the duration has or will likely exceed the Threshold Value.

1. An UNPLANNED event results in RCS temperature exceeding 200°F.
2. Loss of all RCS temperature **AND** RPV level indication for greater than 15 minutes.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC is included as a NOUE because it may be a precursor of more serious conditions and, as a result, is considered to be a potential degradation of the level of safety of the plant. In cold shutdown the ability to remove decay heat relies primarily on forced cooling flow. Operation of the systems that provide this forced cooling may be jeopardized due to the unlikely loss of electrical power or RCS inventory. Since the RCS usually remains intact in the cold shutdown mode a large inventory of water is available to keep the core covered. In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode.

During refueling the level in the RPV will normally be maintained above the RPV flange. Refueling evolutions that lower water level below the RPV flange are carefully planned and procedurally controlled. Loss of forced decay heat removal at reduced inventory may result in more rapid rises in RCS/RPV temperatures depending on the time since shutdown.

Unlike the cold shutdown mode, normal means of core temperature indication and RCS level indication may not be available in the refueling mode. Redundant means of RPV level indication are therefore procedurally installed to assure that the ability to monitor level will not be interrupted. However, if all level and temperature indication were to be lost in either the cold shutdown of refueling modes, Threshold Value 2 would result in declaration of a NOUE if either temperature or level indication cannot be restored within 15 minutes from the loss of both means of indication.

The Emergency Director must remain attentive to events or conditions that lead to the conclusion that exceeding the Threshold Value is imminent. If, in the judgment of the Emergency Director, an imminent situation is at hand, the classification should be made as if the threshold has been exceeded.

¶CU6

Initiating Condition

UNPLANNED Loss of All Onsite **OR** Offsite Communications Capabilities.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1 **OR** 2)

1. UNPLANNED loss of ALL of the following on-site communications capability affecting the ability to perform routine operations:

In plant telephones
Public address system
Plant radio systems

2. UNPLANNED loss of ALL of the following off-site communications capability:

ENN (Emergency Notification Network)
ENS (Emergency Notification System)
Commercial phones (Radio, PBX, Satellite, Wireless)
VOIP (Voice Over Internet Protocol)
OPX (Off Premise Extension)

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

The purpose of this IC and its associated Threshold Values is to recognize a loss of communications capability that either defeats the plant operations staff ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities.

The availability of one method of ordinary offsite communications is sufficient to inform state and local authorities of plant problems. This Threshold Value is intended to be used only when extraordinary means (e.g., relaying of information from radio transmissions, individuals being sent to offsite locations, etc.) are being utilized to make communications possible.

¶CU7

Initiating Condition

UNPLANNED Loss of Required DC Power for Greater than 15 Minutes.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1a **AND** 1b)

1. a. UNPLANNED loss of Vital DC power to 125 VDC Bus A **AND** B indicated by bus voltage indications less than 105 VDC

   AND

   b. Failure to restore power to at least one DC bus within 15 minutes from the time of loss.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

The purpose of this IC and its associated Threshold Values is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations. This Threshold Value is intended to be anticipatory in as much as the operating crew may not have necessary indication and control of equipment needed to respond to the loss.

105 VDC bus voltage is based on the minimum bus voltage necessary for the operation of safety related equipment. This voltage value incorporates a margin of at least 15 minutes of operation before the onset of inability to operate those loads.

CU8

Initiating Condition

Inadvertent Criticality.

Operating Mode Applicability: Cold Shutdown (Mode 5)
Refueling (Mode 6)

Threshold Values: (1)

1. An UNPLANNED sustained positive startup rate observed on nuclear instrumentation.

Basis:

UNPLANNED: a parameter change or an event that is not the result of an intended evolution and requires corrective or mitigative actions.

This IC addresses criticality events that occur in Cold Shutdown or Refueling modes such as fuel mis-loading events and inadvertent dilution events. This IC indicates a potential degradation of the level of safety of the plant, warranting a NOUE classification.

The term "sustained" is used in order to allow exclusion of expected short term positive startup rates from planned fuel bundle or control rod movements during core alterations. These short term positive startup rates are the result of the rise in neutron population due to subcritical multiplication.

EMERGENCY PLAN
Part II

MEDICAL PLAN

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RADIATION EMERGENCY MEDICAL PLAN

I. INTRODUCTION

A. PURPOSE

It is the objective of the Radiation Emergency Medical Plan to provide for the selection and delivery of appropriate medical care for personnel who may have been exposed to serious radioactive contamination or radiation injury, possibly concomitant with other injuries, at the Joseph M. Farley Nuclear Plant. In the event of an accident, to ensure a smooth flow of action from initial evaluation and treatment through final disposition, knowledgeable decision making regarding medical priorities is required. Adequate arrangements for transportation of injured personnel and assurance that proper facilities as well as expert professional and paramedical services are immediately available are necessary. Through careful planning, training and practice, this objective will be accomplished.

B. SCOPE

The plan provides for onsite medical support and offsite medical support at three levels: primary care, definitive care, and back-up definitive care. A description of casualty flow to these facilities including action levels, transportation available and notification procedures, is given.

Provisions are made for training at the local level of support to minimize the chance of an accident and to ensure that, in the event of an accident, affected personnel onsite and offsite respond appropriately without compounding the medical or radiological problems present.

II. MEDICAL SUPPORT AND FACILITIES

A. PLANT SITE

1. General
Onsite emergency medical activities are performed by trained and qualified persons immediately available under the direction of the Emergency Director and will consist of:

a. Removal of personnel from hazardous area (high radiation level or contamination levels)

b. First aid for severe physical injuries

c. Personnel decontamination

d. Evaluation of radiation exposure

e. Triage of personnel

An aerial view of the plant site is shown in FIGURE 1.

2. Facilities

The health physics and decontamination facility is located at elevation 155 of the Auxiliary Building as shown in FIGURE 2 and FIGURE 3.

This facility is located near potentially contaminated and high radiation areas so that health physics support, first aid, and personnel decontamination can be effectively administered. A Health Physics technician will normally be available at this facility.

In the event of a Site Area or General Emergency when the health physics and decontamination facility might become untenable, the Nursing Station (FIGURE 4) at the Training/Visitor's Center will normally become the center for personnel first aid and decontamination activity. The necessary first aid and decontamination supplies for these facilities are listed in APPENDIX A.

B. SOUTHEAST ALABAMA MEDICAL CENTER (SAMC)

The Southeast Alabama Medical Center (SAMC) of Dothan, Alabama, has agreed to accept injured, contaminated and/or irradiated casualties (APPENDIX B). This hospital is a 400 bed general hospital fully accredited by the State Hospital Association and Joint Commission for Accreditation of Hospitals and Organizations. It has a modern fully equipped emergency room of sixteen suites with provisions to perform all necessary procedures; complete laboratory and diagnostic x-ray capabilities; and 13 major and 1 minor surgical suites. There are approximately 100+ members on the active staff, the majority board certified or qualified representing all major medical specialties.

Space (FIGURE 5) at the hospital provides a receiving area for potentially contaminated and/or irradiated patients and has a separate entrance from the normally used emergency entrance. This facility is adequate for:

1. Personnel decontamination

2. Emergency treatment

3. Storage of emergency equipment and supplies

A permanent helipad exists for air evacuation of injured or irradiated personnel via helicopter. Communications can be established by FNP with SAMC through the hospital's switchboard or directly with the hospital emergency room.

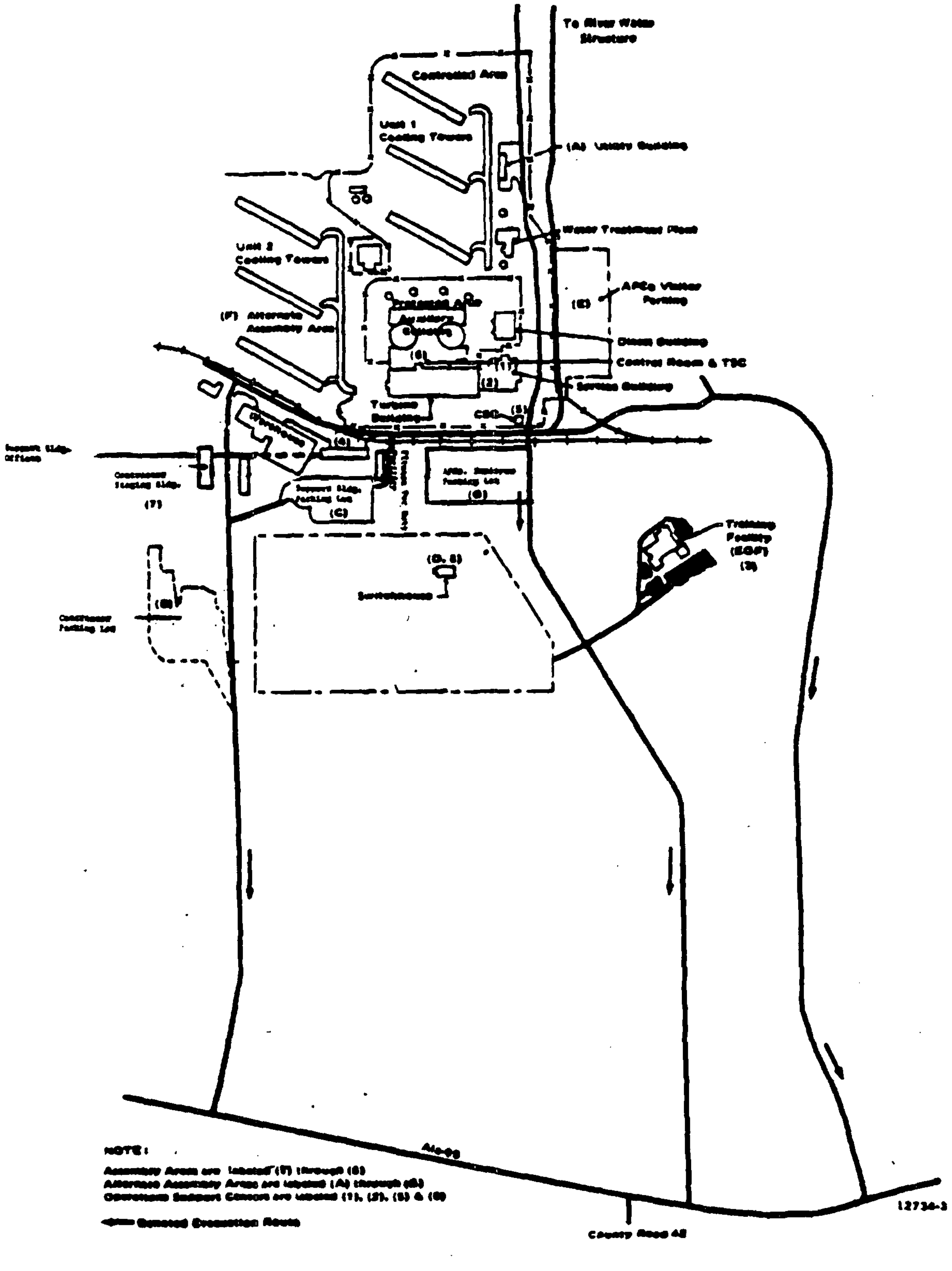
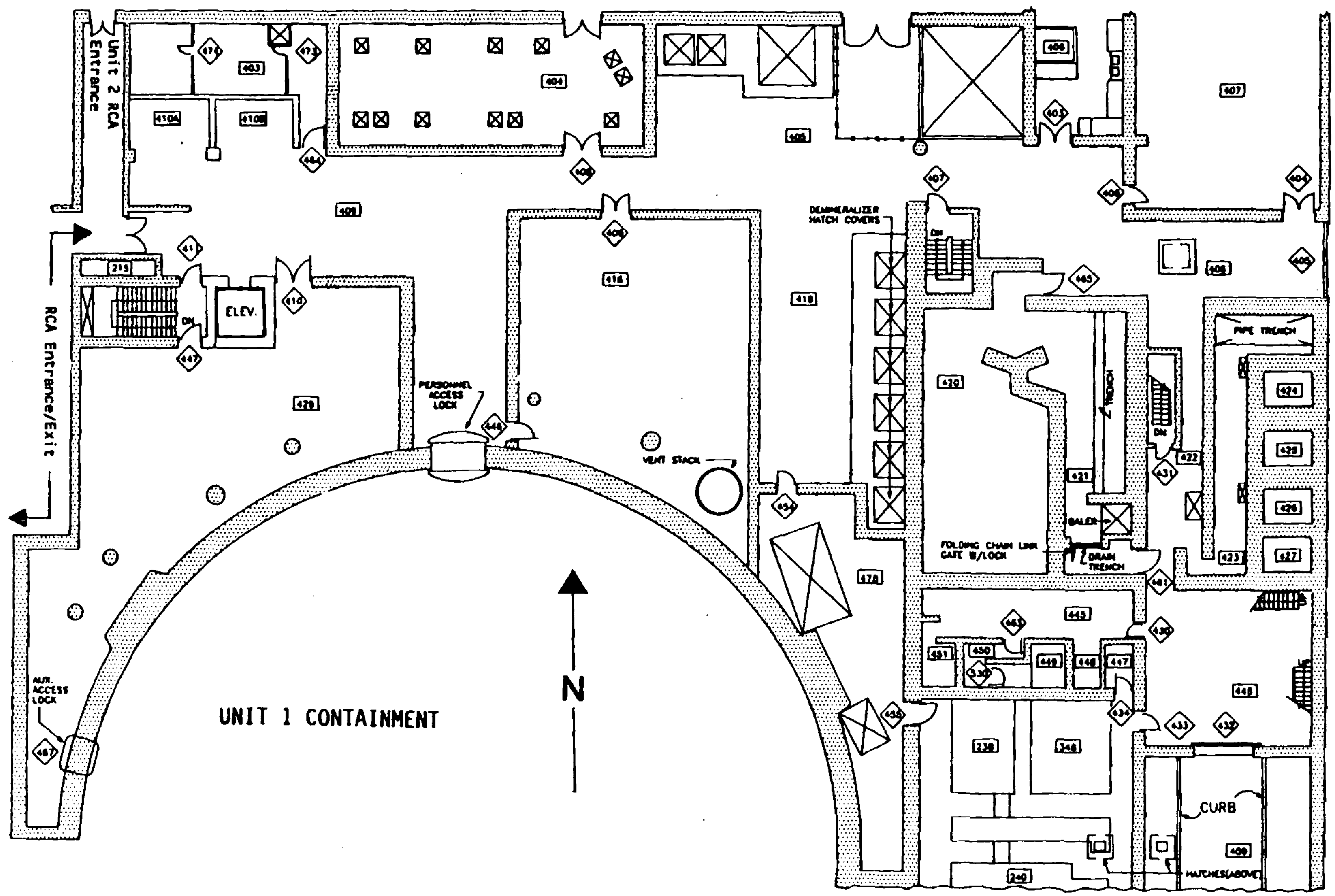
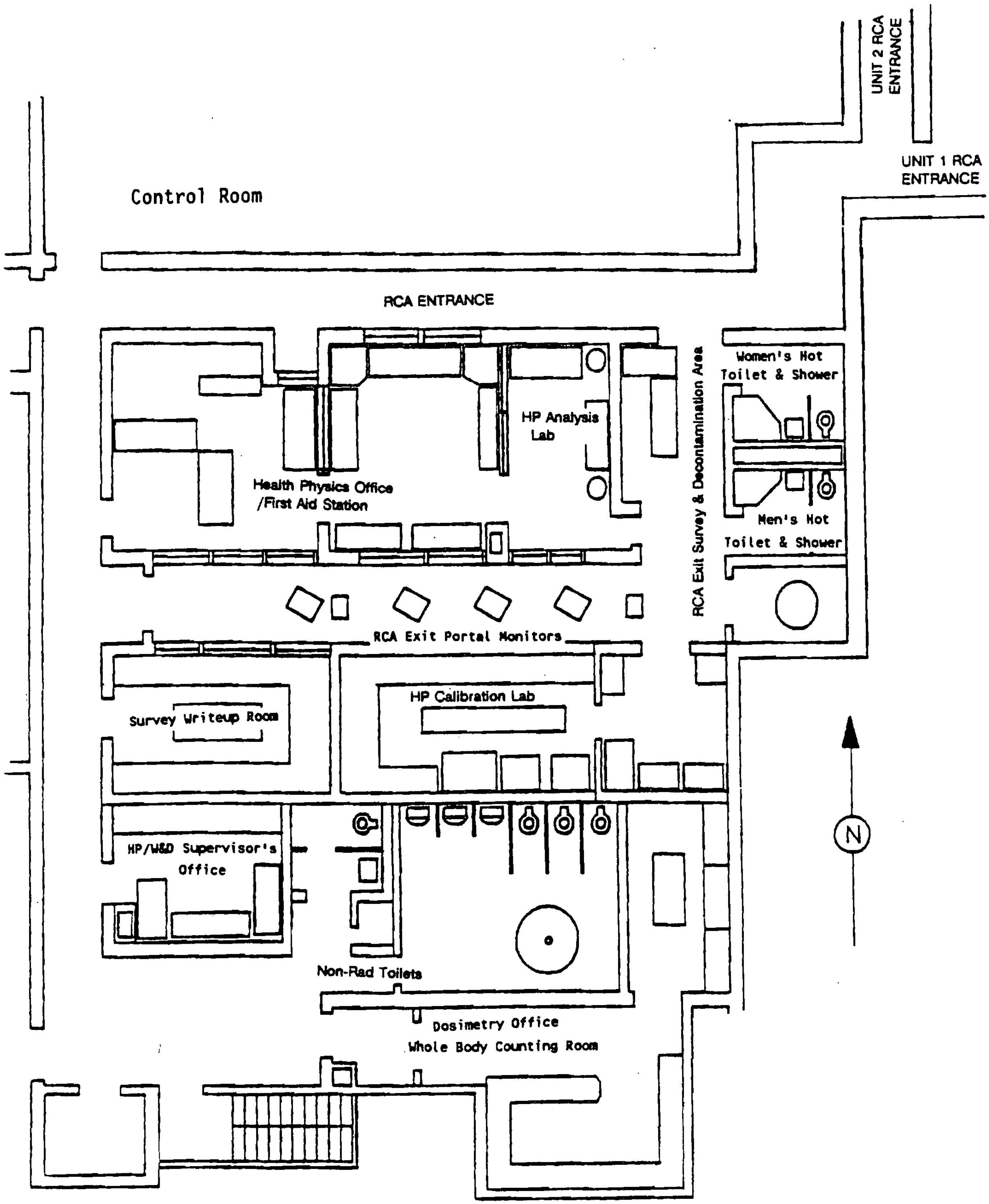


FIGURE 1 Aerial view of plant site



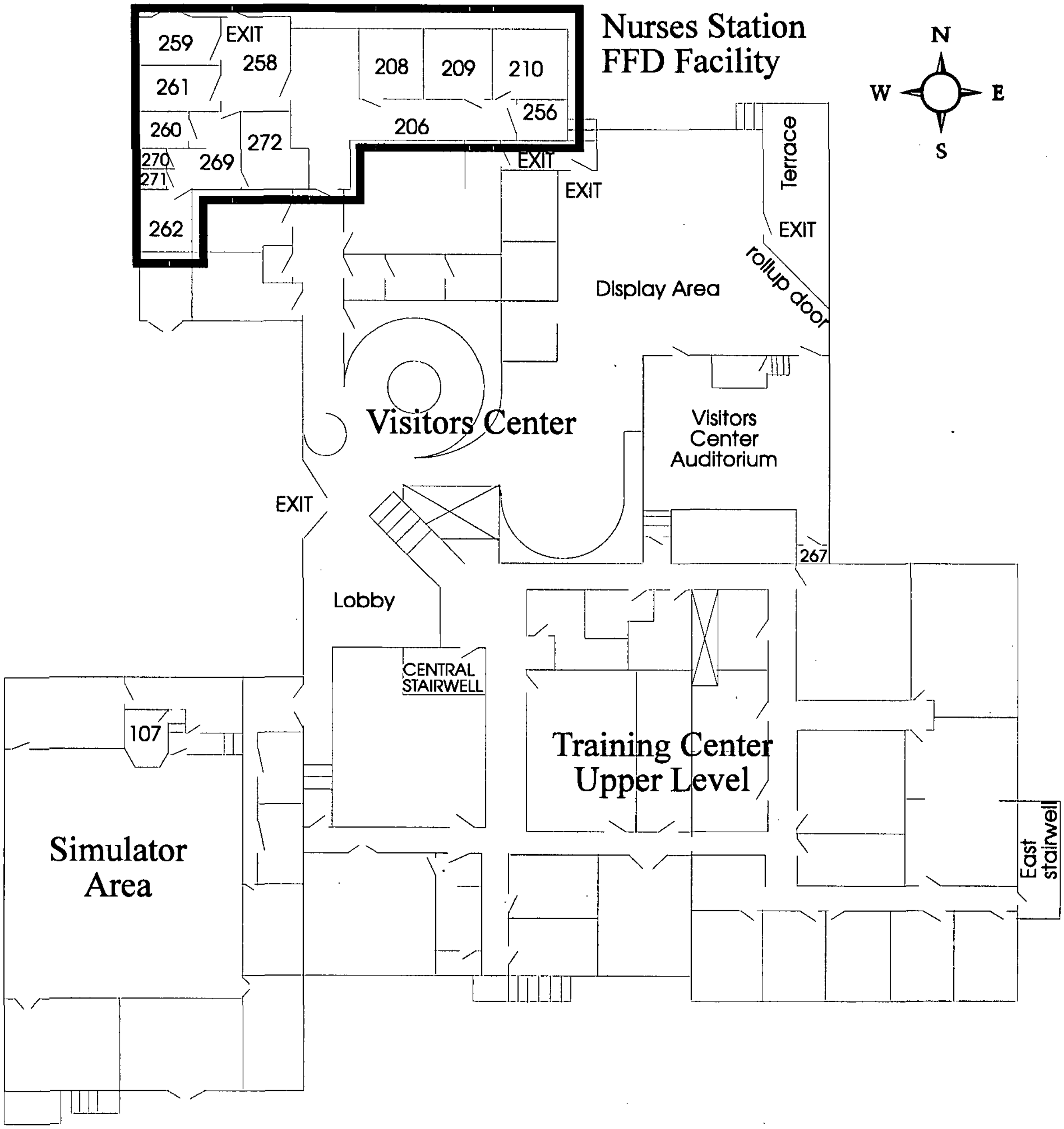
Unit 1 RCA 155' Auxilary Building
Exit to Decontamination/First Aid Station

Figure 2



Health Physics Office, First Aid Station, and Decontamination Area

Figure 3



FITNESS FOR DUTY/NURSE'S STATION

Figure 4

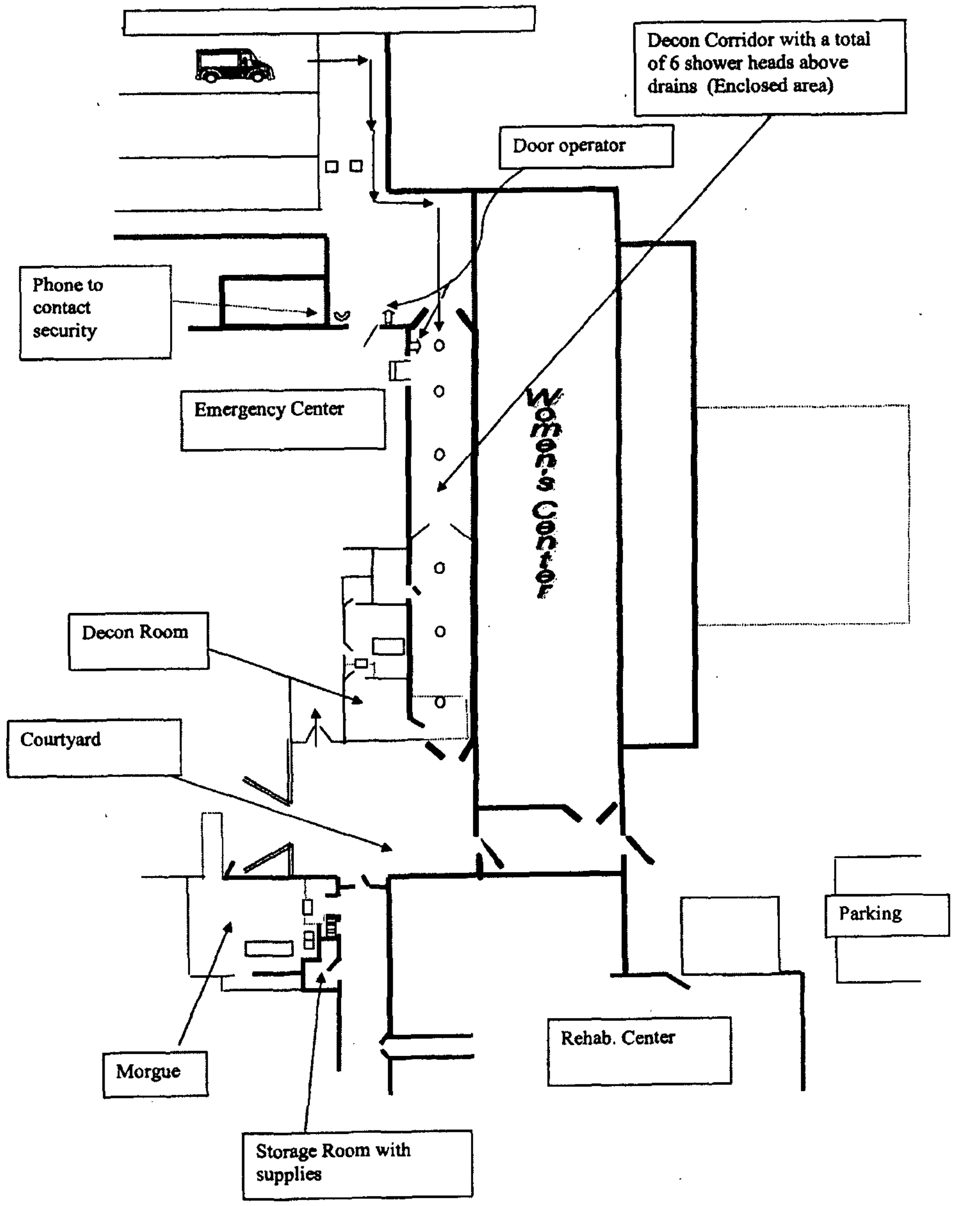


FIGURE 5 Southeast Alabama Medical Center Floor Plan

C. THE UNIVERSITY OF ALABAMA HOSPITAL (RCTF)

The University of Alabama Hospital in Birmingham, Alabama, has agreed to admit and provide on a priority basis definitive care for contaminated and/or irradiated casualties (APPENDIX B). This hospital is a 639 bed teaching institution affiliated with the University of Alabama in Birmingham School of Medicine. It is accredited by the Joint Commission on Accreditation of Hospitals and Organizations and is licensed by the Alabama State Board of Health. It is a member of the American Hospital Association, the Council of Teaching Hospitals and the Alabama Hospital Association. Its specialists in oncology, hematology, infectious disease, endocrinology, gastroenterology, nuclear medicine, radiology, and the surgical specialties render it fully capable of providing effective medical care. Already in existence are portable and fixed isolation units capable of maintaining a sterile environment.

Facilities for the care of radiation emergency casualties have been developed to provide a Radiation Casualty Treatment Facility (RCTF). The RCTF consists of a nine bed unit, a nursing station, utility room, storage room, and a treatment and examination room.

D. OAK RIDGE Institute of Science and Education (ORISE)

Oak Ridge Associated Universities operates a Radiation Emergency Assistance Center Training Site in Oak Ridge, Tennessee. Its specialized facilities and staff are available for the care and treatment of possible radiation casualties from the Joseph M. Farley Nuclear Plant of Alabama Power Company in Dothan, Alabama (APPENDIX B). The ORISE-REAC/TS can accommodate approximately 20 patients who are contaminated or have received external radiation. A laminar flow facility with two sterile rooms is available for patients requiring isolation. Sophisticated whole-body counting equipment, probes for locating radioactive particles in wounds, and computer-based monitoring services are also available. The staff of the ORISE-REAC/TS has considerable experience in total-body irradiation and several have participated in the handling of previous radiation accident casualties. The nursing staff, aides and orderlies, likewise, are experienced in handling patients who have been treated with or accidentally exposed to both external and internal radiation. Full diagnostic laboratory and radiographic back-up facilities are available. A description of their facilities is given in APPENDIX E.

III. RADIATION CASUALTY HANDLING PROCEDURE

A. NOTIFICATION

A general order of notification in the event of an incident at the Farley Nuclear Plant is given in PART I, FIGURE 24. Detailed lines of notification and communication concerning medical support are given in FIGURE 6 of this plan.

B. ONSITE RESPONSIVE ACTION

Actual or suspected radiation casualties, with or without concomitant trauma, will be moved to the primary onsite decontamination area as shown in FIGURE 2 and FIGURE 3. If this primary onsite decontamination area is unavailable as a result of the emergency, the casualties will be moved to the secondary onsite decontamination area as shown in FIGURE 4. The priority order of onsite medical emergency action will then be:

1) First aid of life-threatening or severe physical injury;

2) Personnel decontamination, to the extent that trauma is aggravated;

3) Evaluation of radiation exposure, external and internal, with concomitant first aid of other injuries.

The actual or suspected casualties may be grouped into three classes for triage considerations.

<u>Class I</u>

<u>Criteria</u>

1) Estimated radiation dose greater than applicable 10CFR20 limits but less than 5 rem to whole body (including eyes, gonads, and blood-forming organs); or

2) Estimated radiation dose to the skin of the whole body greater than the 10CFR20 limit but less than 30 rem; or

3) Estimated radiation dose to the feet, ankles, hands, or forearms greater than the 10CFR20 limit but less than 75 rem.

<u>ACTION</u>

1) Without trauma - Send to Southeast Alabama Medical Center (SAMC) for evaluation after clearance by Health Physics for contamination.

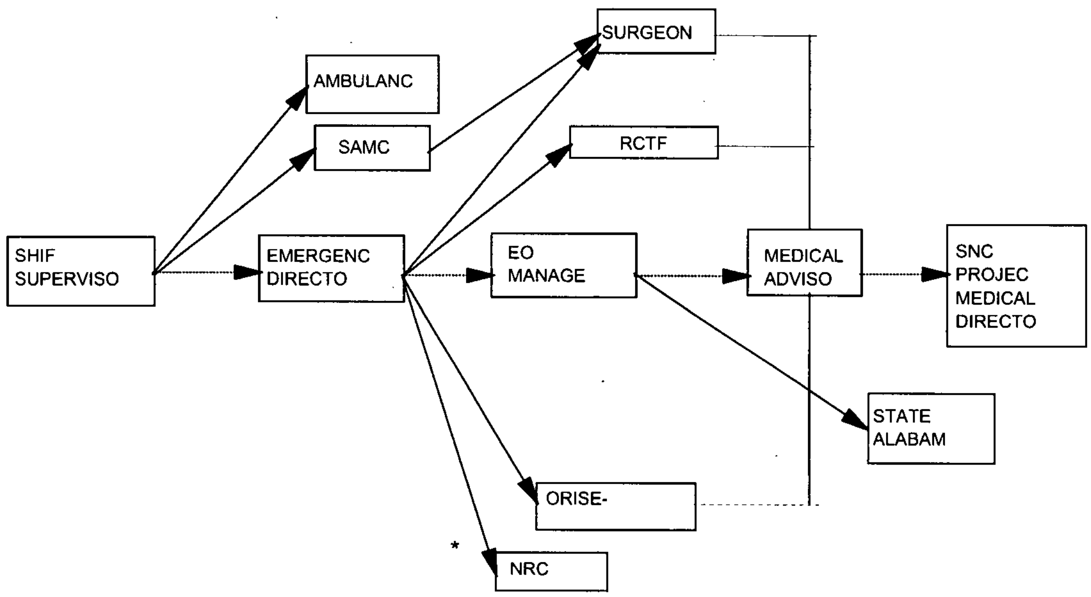
2) With trauma - Apply appropriate first aid then send to SAMC for evaluation. Monitoring for contamination is desirable prior to sending the casualty to SAMC.

<u>Class II</u>

<u>Criteria</u>

1) Estimated radiation dose to the whole body (including eyes, gonads, and blood-forming organs) greater than 5 rem but less than 25 rem, or

MEDICAL NOTIFICATION ORDER



* If injury involves contamination, excessive exposure or if it is anticipated that injured will be admitted to the hospital for observation or treatment in excess of 48 hours duration.

FIGURE 6 - MEDICAL NOTIFICATION ORDER

2) Estimated radiation dose to the skin of the whole body greater than 30 rem but less than 150 rem; or

3) Estimated radiation dose to the feet, ankles, hands, or forearms greater than 75 rem but less than 375 rem.

Action

1) Without trauma send to SAMC for evaluation after clearance by Health Physics for contamination.

2) With trauma apply appropriate first aid, then send to SAMC for evaluation. Monitoring for contamination is desirable prior to sending the casualty to SAMC.

Class III

Criteria

1) Estimated radiation dose to the whole body (including eyes, gonads, and blood-forming organs) of 25 rem or more; or

2) Estimated radiation dose to the skin of the whole body of 150 rem or more; or

3) Estimated radiation dose to the feet, ankles, hands, or forearms of 375 rem or more.

4) Internal radiation exposure estimated to be significant.

Action

1) Without trauma - after proper decontamination by Health Physics, send to SAMC for evaluation and potential transfer to the Radiation Casualty Treatment Facility (RCTF) in Birmingham or to ORISE-REAC/TS in Oak Ridge,Tennessee.

2) With trauma - appropriate first aid, decontamination, and send to SAMC for treatment and potential transfer to RCTF or REAC/TS.

The above estimates of external and internal radiation exposures will be performed by the Health Physics staff on the basis of all available information, including dosimeters, area monitors, air monitors, and survey instruments.

Contaminated casualties sent to SAMC, RCTF, or REAC/TS will be accompanied by a person who is qualified in radiological monitoring and will stay in attendance and maintain radiological control until decontamination is complete. Contaminated casualties will be covered with suitable protective clothing or plastic sheets so as to prevent or minimize the spread of radioactive material. Radiation exposure to the vehicle operator and any attendant personnel will be minimized to the extent possible, and shadow shields may be used. Inhalation of airborne radioactive material may be minimized through the use of respiratory protective devices.

Each casualty will be identified before leaving the plant with a nonremovable hospital type wristband showing his name and an identification number for use for reference purposes in all communications, to avoid possible confusion in reporting estimates of radiation dose and similar matters.

C. SAMC RESPONSIVE ACTION

All casualties sent to SAMC will enter the Radiation Casualty/Decontamination area and be surveyed by qualified personnel assigned for that purpose. Emergency medical care will be provided if required together with further decontamination.

1) Criteria

Those casualties with estimated radiation doses less than 25 rem to the whole body (including eyes, gonads, and blood-forming organs) and estimated from bioassay measurements and other reasons not to be bearing significant quantities of internal emitters.

Action

Hospitalize if necessary for continued treatment of trauma or illness; otherwise continue minor treatment, observation and evaluation on out-patient basis, after release by Health Physics personnel. Observation and evaluation will include hematological surveys, bioassays of urine and feces, and general physical condition, including opthalmological and dermatological examinations. If evaluation so indicates (e.g., leukopenia), transfer to RCTF or REAC/TS.

2) Criteria

Those casualties with estimated radiation doses of greater than 25 rem to whole body, or thought from bioassay measurements and other reasons to be bearing significant quantities of internal emitters.

Action

Transfer to RCTF or REAC/TS (after emergency treatment of trauma or illness).

In the event of mass casualties, a decision will be made as to which casualties will be sent from SAMC to RCTF, or directly to ORISE REAC/TS. This decision will be made by the Medical Director of the Southern Nuclear Operating Company or his designated alternate, with the advise of staff and consultants.

Contaminated and/or irradiated casualties sent from SAMC to RCTF, ORISE-REAC/TS or elsewhere, will be accompanied by a person qualified in radiological monitoring. This person will stay in attendance and maintain radiological control until the patient is transferred to a similarly qualified person at the receiving institution.

All rooms, equipment, and supplies used to treat contaminated personnel will be made controlled areas and considered to be contaminated until released by the Health Physics staff.

D. RCTF RESPONSIVE ACTION

Casualties sent to RCTF will be met outside the building by an individual qualified in radiological monitoring, will enter through the appropriate emergency room entrance of the University of Alabama Hospital, be surveyed and then transported directly to the RCTF. The staff of the RCTF will have been previously notified and will be ready to accept the patients.

IV. TRANSPORTATION

A. SERVICES AVAILABLE

1. Local Rescue Squads

Ashford Rescue Squad has agreed to transport contaminated and/or irradiated casualties from the plant site to Southeast Alabama Medical Center (SAMC) in Dothan, Alabama.

Columbia Rescue Squad has agreed to transport contaminated and/or irradiated casualties from the plant site to Southeast Alabama Medical Center (SAMC).

2. Dothan Ambulance Service (Pilchers Ambulance Service), Inc.

Dothan Ambulance Service, Inc. has agreed to transport potentially contaminated and/or irradiated casualties from the plant site to SAMC and on to the University of Alabama Hospital in Birmingham, Alabama or Radiation Emergency Assistance Center Training Site (REAC/TS) of Oak Ridge Institute for Science and Education (ORISE) in Oak Ridge, Tennessee.ORISE-REAC/TS. Their ambulances are equipped with radios so they can be in communication through SAMC with the Control Room (Letter of Agreement - APPENDIX B).

3. American Medical Response Ambulance Service

American Medical Response Ambulance Service in Birmingham, Alabama (formerly Careline Ambulance Service) has agreed to transport contaminated and/or irradiated casualties from the Birmingham Airport or helipad to the University of Alabama Hospital (Letter of Agreement - APPENDIX B).

B. ROUTES

1. Plant Site to SAMC (Figure 7, 8)

Normally, emergency vehicles will proceed west on County Road 42 to County Road 33; southwest on County Road 33 to County Road 55; south on County Road 55 to U.S. 84, west on U.S. 84, until its junction with State Highway 210 (Ross Clark Circle) at which point the Medical Center is located.

If the normal route is unavailable then an alternate route will be directed by the control room. Two such alternate routes are shown on Figure 7.

2. Plant Site or SAMC to the University of Alabama Hospital (FIGURE 9)

As in 1 above, to State Highway 210 (Ross Clark Circle); then north on 210 to its junction with U.S. Highway 231; Highway 231 north to Montgomery and junction with Interstate 65 then north on Interstate 65 to Birmingham. Exit Interstate 65 at 8th Avenue South; east to 19th Street; north to 6th Avenue South; east to University Hospital Emergency Room.

3. SAMC to Oak Ridge, Tennessee (FIGURE 9)

As in 2 above on Interstate 65 to Interstate 59 north to Chattanooga, Tennessee; north on Interstate 75 to Interstate 40; west on Interstate 40 to State Highway 95; north on State Highway 95 to Oak Ridge, Tennessee, then north on New York Avenue to West Tennessee Avenue; east to ORISE-REAC/TS.

V. DRILLS

Radiation emergency practice drills will be conducted annually to maintain the proficiency of the organization and personnel at the plant, SAMC and at the RCTF and to verify the arrangements made with other groups. Drills will be arranged so as to provide quantative data on response times for each communication, decision and action element of the overall Radiation Emergency Medical Plan. These response times will be used to predict the effectiveness of the Plan and to disclose areas where improvement in training, equipment or organization is needed. Management review of critique comments obtained from drill monitors will be conducted. Identified, necessary, or required alterations in training or for the Emergency Plan/EIPs will be implemented in a timely manner.

VI. TRAINING

A. OPERATIONS AND MAINTENANCE PERSONNEL

Permanently assigned personnel will undergo radiation protection training, the extent of which will depend on the nature of the specific job. Each employee will be required as part of his training to be familiar with radiation protection practices, facilities and equipment at the plant as described in the Health Physics Manual. At least one person on each shift will be qualified to perform first aid.

B. HEALTH PHYSICS PERSONNEL

All Health Physics Technicians will be thoroughly trained in the principles of radiation protection including personnel dosimetry, decontamination and monitoring.

C. PHYSICIANS

Several physicians in the Houston County area have been retrained to provide care for injured, contaminated, and/or irradiated victims. These physicians are encouraged to attend a training seminar on the care of radiation injuries. The Medical Director for the Southern Nuclear Operating Company has also attended this seminar.

D. PARAMEDICAL PERSONNEL

Ambulance attendants, nurses and hospital technicians will be encouraged to attend annual training sessions. These sessions will be conducted under the direction of the Training Director. Training will include a description of the facility, its health physics program, the spectrum of possible accidents with emphasis on potential resulting casualties and procedures for implementing the Radiation Emergency Medical Plan.

VII. RADIATION EXPOSURE GUIDELINES

The following guidelines are given for the exposure of hospital and ambulance service personnel:

A. 3 REM

If there is an adequate number of attendants such that rotation may be accomplished without further endangering the patient(s).

B. 5 REM

If the number of attendants is limited such that personnel cannot be rotated.

C. 25 REM

To save a life.

The above guideline numbers refer to whole body penetrating radiation. When careful monitoring is provided, the extremities dose may be up to 5 times the value given and the skin dose may be up to 2 times the value given.

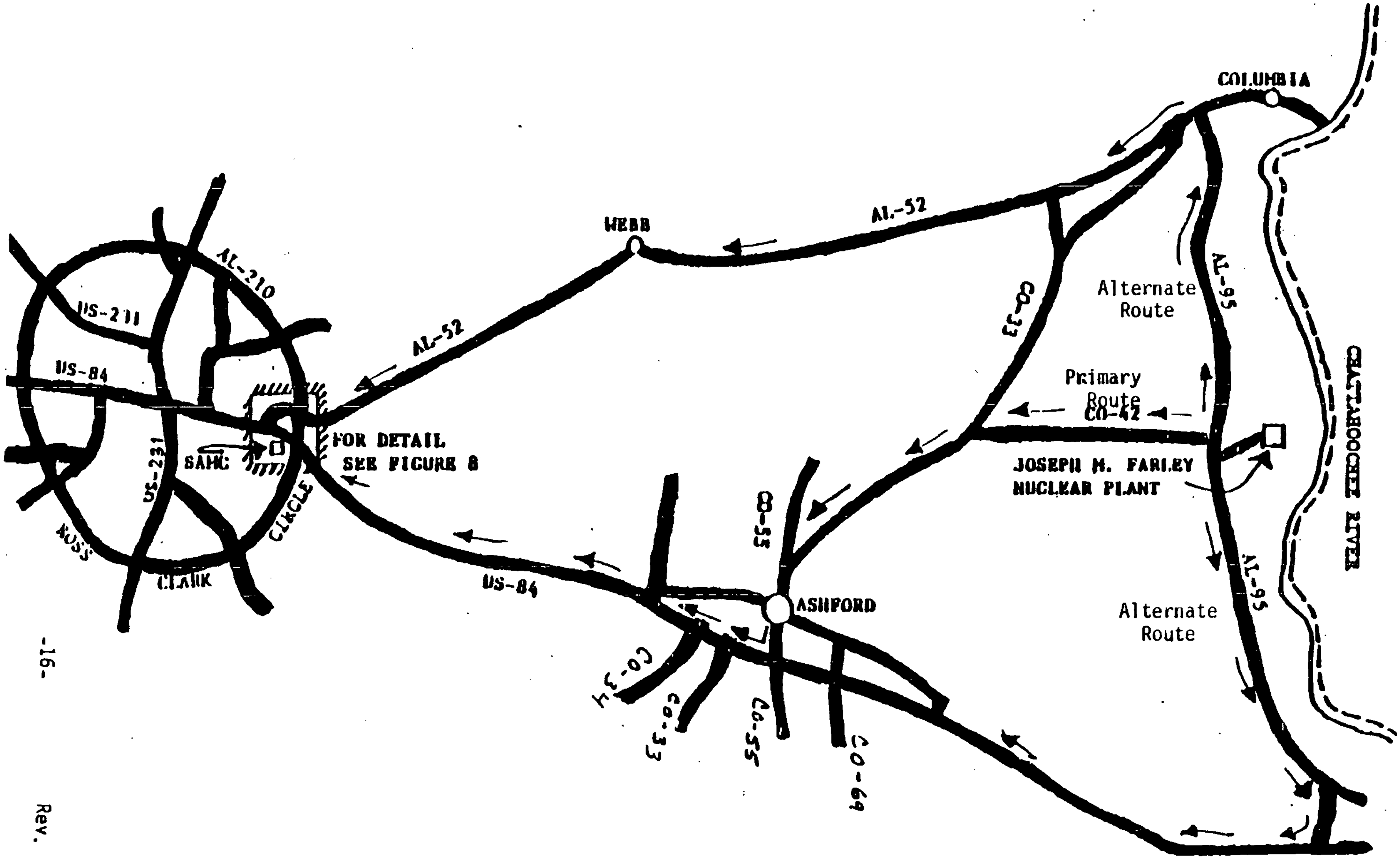
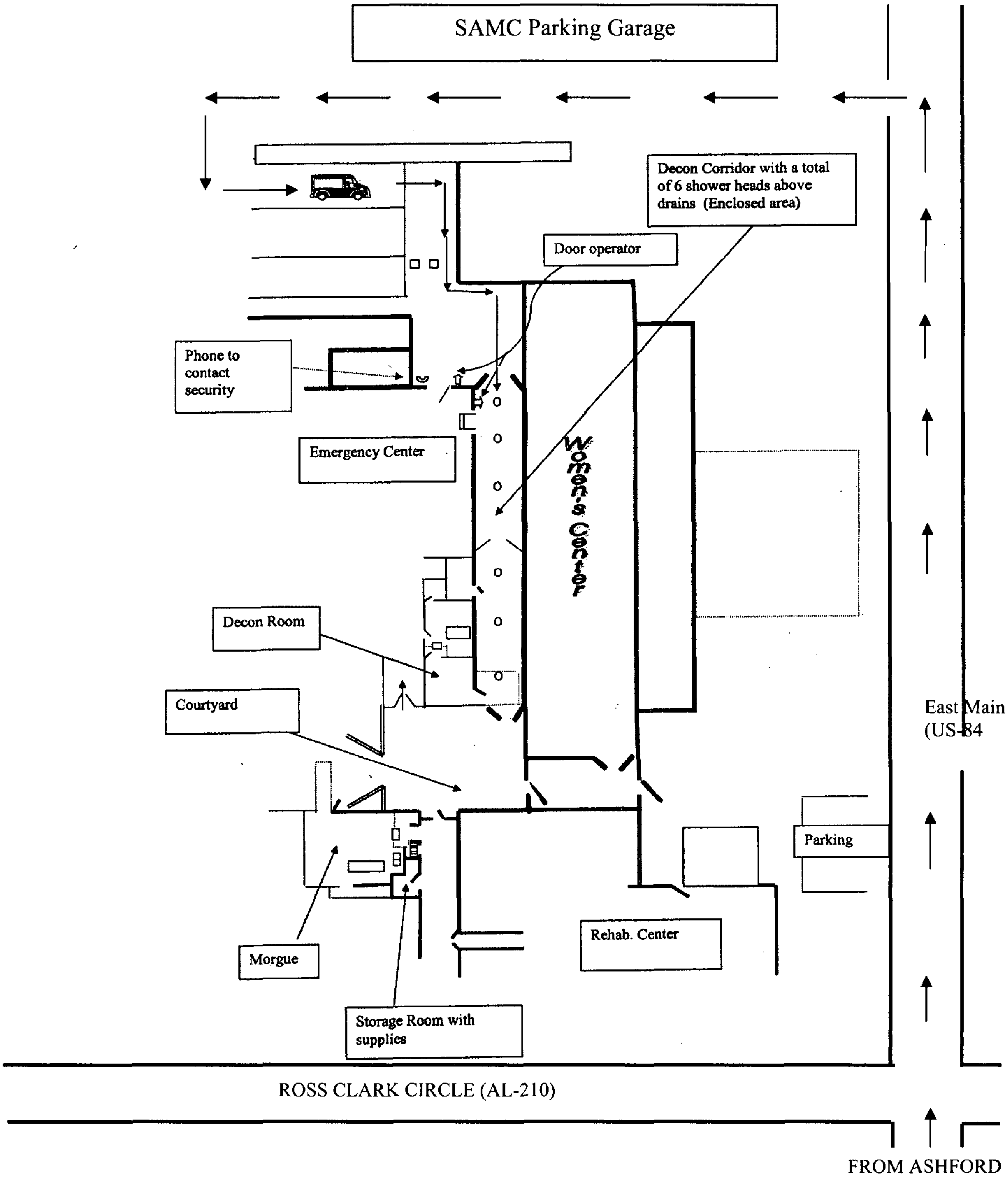


FIGURE 7 MAJOR ROUTE TO SOUTHEAST ALABAMA MEDICAL CENTER



RADIATION CASUALTY ENTRANCE TO SAMC

FIGURE 8

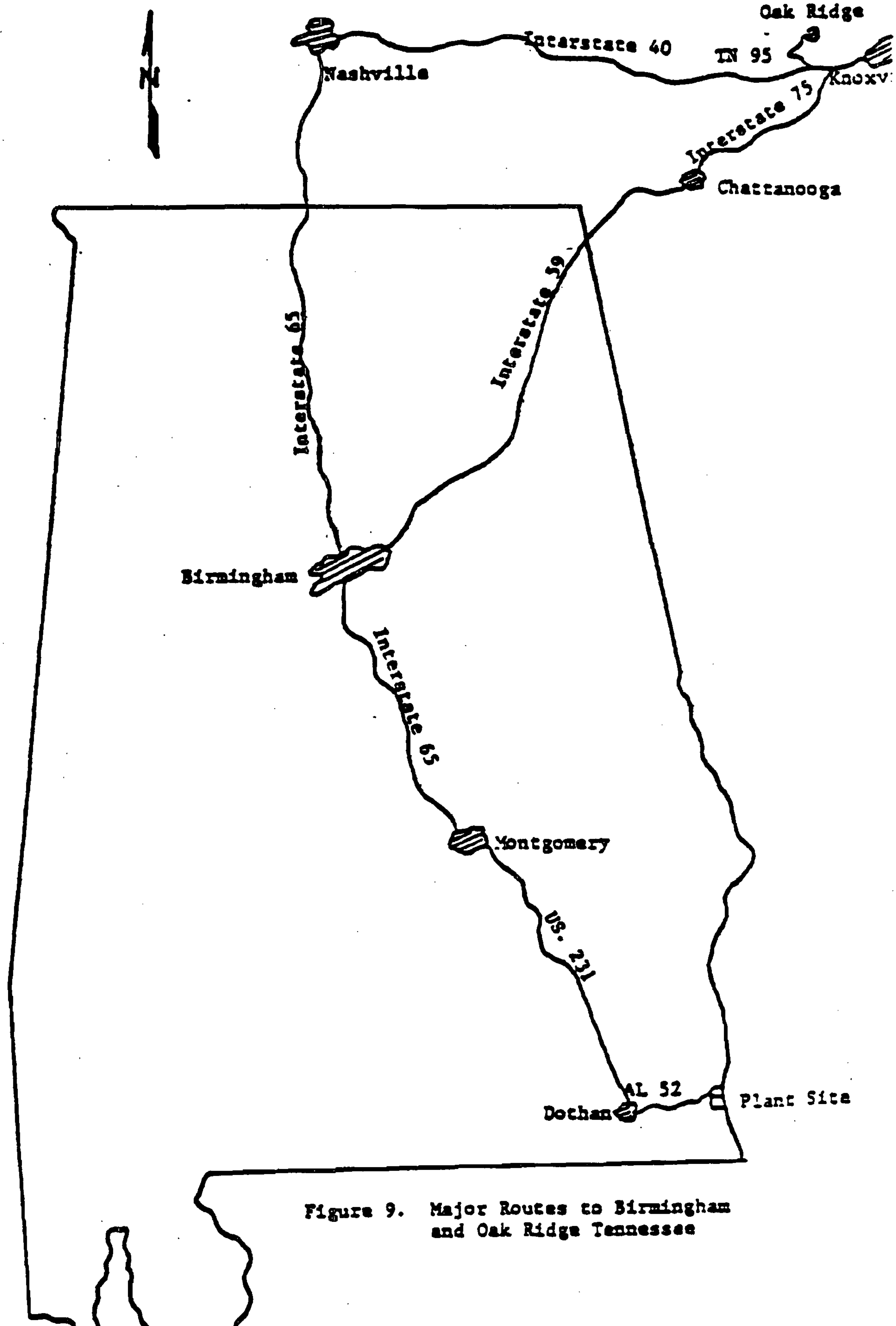


Figure 9. Major Routes to Birmingham and Oak Ridge Tennessee

APPENDIX A

EMERGENCY EQUIPMENT AND SUPPLIES

I. HP OFFICE

Blankets
First Aid Supplies
Protective Clothing and Supplies
Decontamination Supplies
Wristbands
Survey Meter

II. NURSING STATION

Audiometric Testing Equipment
Pulmonary Testing Equipment
Vision Testing Equipment
Physical Examination Equipment
First Aid Supplies

III. PEV DELETED

IV. AMBULANCE KIT

Protective Clothing
Lead Covering Material
Blankets
Signs and Labels
Wristbands
Dosimetry Devices

V. SOUTHEAST ALABAMA MEDICAL CENTER

Survey Meters and Supplies
Dosimetry Devices
Signs and Labels
Protective Clothing
Surgical Clothing
Decontamination Supplies
Specimen Containers
Disposable Cartons
Logbook and Pencil

APPENDIX B

Letters of Agreement on File

The following letters of agreement and memorandums of understanding are maintained on file with the Emergency Planning Coordinator:

Agreement Between APCo and the Board of Trustees of the University of Alabama to Provide for a Radiation Casualty Treatment Facility at University Hospital, Birmingham to Accomodate the Radiation Emergency Medical Plans and Needs of Alabama Power Company (01-01-87) Amendment (3/12/90)

Letter of Agreement Between Careline of Alabama Ambulance Service and SNC (1-10-95)

Letter - Southeast Alabama Medical Center (02-12-2004)

Letter - Radiation Emergency Assistance Center Training Site(REAC/TS)(12-18-2000)

Letter of Agreement Between Dothan Ambulance Service, Inc. and APCo (10-01-1986)

Assignment of Emergency Planning Agreements

Letter of Agreement between Ashford Rescue Squad and Southern Nuclear Operating Company

Letter of Agreement between Columbia Rescue Squad and Southern Nuclear Operating Company

EMERGENCY ACTION MANUAL

POLICIES AND PROCEDURES

The policies and procedures of this Emergency Action Manual have been reviewed, revised as necessary, and approved by appropriate authorities. This current edition becomes effective January, 1998 and supersedes any previous editions.

Review Date: January, 1999

Ronald S. Owen
Chief Executive Officer

James C. Jones, D.O.
President Medical Staff
~~Medical Director~~
Emergency Department

Wanda Fassett
Quality Management

Jerry Blevins
Division Director
Facilities Management

Diane Buntyn
Patient Care Services
Administration

C. Wayne Hannah, M.D., J.D.
Medical Director

Bruce McNeal
Director of Safety

Lesia Hollis
Director of Security

Anna Smith
Radiation Safety Officer

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RADIATION ACCIDENT PLAN
Section 9.1

INTRODUCTION

It is imperative that Southeast Alabama Medical Center have an operational plan to safely handle any radiation accidents, even though the possibility of such occurrences is remote.

Because of the proximity to Farley Nuclear Plant, Southeast Alabama Medical Center has a written agreement with the Southern Nuclear Operating Company to act as a casualty treatment center for any events occurring at that facility. The hospital, medical staff and multidisciplinary staff will be available to persons who have been exposed to serious radioactive contamination or suffer from radiation injury.

This plan will be written for radiation injury patients in general, and any policies specific to the treatment of Farley Nuclear Plant occurrences will be written in parentheses, and can be ignored if the injury was sustained elsewhere.

LOCATION OF THE DECONTAMINATION AREA

1) Two designated areas have been established to handle injured patients with radiation contamination. The morgue as well as the Emergency Center decontamination room has been designated as areas for decontamination and treatment of radiation victims. If an alternative location for decontamination needs to be used, the Emergency Center Physician will so designate.

2) The Emergency Center Physician will identify which decon area will be established. In the event of multiple contaminated patients, both decon areas may be established

3) The radiation decon supply room, located outside the Morgue, will serve as the supply room for both designed areas.

4) The hallways outside the decontamination areas may be used as a holding area.

5) Overflow patients are to be transported to the University of Alabama Hospital in Birmingham via MAST.

6) Large numbers of contaminated victims will be treated or held in the Wiregrass Recreation Center, located on Sixth Avenue, Dothan, Alabama.

E.D. COMMUNICATIONS RECEIPT FORM POLICY

Upon receipt of information regarding radiation accident occurrence, the person receiving the information shall be responsible for the completion of the E.D. Communications Receipt Form. (next page)

1) Verify the validity of the accident by returning a call to the reporting person or company.

2) Complete the form with as much information as available.

3) Forward the completed form promptly to the shift coordinator.

ED COMMUNICATION RECEIPT FORM

Obtain the following information from the radiation accident scene:

1. Number of casualties: ______________________

2. Estimate of the severity of injuries: (Notify Fairview Clinic Physician of this estimate): ______________________

____

____

3. Name(s), age(s), sex(s) of casualties (if possible):

NAME	AGE/SEX

4. Method of transport to Southeast Alabama Medical Center:

____

5. Present Location of Casualties: ______________________

____

6. Estimated Time of Arrival: ______________________

ED STAFF TO VERIFY NOTIFICATION BY IMMEDIATELY RETURNING CALL TO RADIATION ACCIDENT SCENE: (IF AT FARLEY NUCLEAR PLANT: 793-2255, (334)899-5156, EXT. 2355 UNIT I, EXT. 2353 UNIT II).

Date Reviewed/Revised 01/97

NOTIFICATION PROCESS
RADIATION ACCIDENT SCENE PERSONNEL

A. EMERGENCY DEPARTMENT STAFF (WILL NOTIFY THE FOLLOWING)

1. ED Physician
2. Operator (request operator to initiate the announcement/notification process for a radiation accident.)
3. (Fairview Clinic Physician on call, 8697 or 794-3192 **IF Radiation Exposure involves Farley Nuclear Plant**)
4. Shift coordinator

B. OPERATOR (WILL NOTIFY THE FOLLOWING)

1. Security (8014)
2. Plant Safety Director (8920)
3. Engineering (8766)
4. Administrator (8701) or Administrator on call from list
5. Technical Director Radiation Oncology (8080)
6. Radiation Oncology Physicist (8080)
7. Radiology Technical Director (8843)
8. Nuclear Medicine Technical Director (8077)
9. Central Sterile (8075)
10. Laboratory (8045)
11. Community Relations (8107)
12. Social Services (8070)
13. Admitting and Discharge (8754)
14. Quality Management Director (8862)
15. Risk Management-Hannah (8705)
16. Behavioral Medicine (8858)

C. SHIFT COORDINATOR (WILL NOTIFY THE FOLLOWING)

1. Patient Care Services Administration (8734)
2. Unit Director or designee of designated area receiving patient
3. Surgical services (if surgery is indicated: 8033)

D. ADMINISTRATOR (WILL NOTIFY THE FOLLOWING)

1. Dothan Police (if necessary; 911 or 793-0100)
2. Alabama Health Department, Radiation Control division (334-206-5391). After hours, use the Radiological Emergency Assistance telephone directory, published by the Alabama State Board of Health (page 34) or call 334-242-4378 and ask operator to page 971)

RADIATION ACCIDENT PLAN
Section 9.22
COMMUNICATION

DECONTAMINATION AREA PHONES

Inside morgue	8935
Radiation supply room	8745
Emergency Center Decon room	712-3326

ADDITIONAL DISASTER CONTROL AREA PHONES

Disaster Control Center	8909
Media Control Center	3402
Family Receiving Control	3401
Employee Pool	3403

Dissemination of information: All information released must come directly from the administrator on call.

Section 9.23
COMMUNICATION: SOURCES OF ASSISTANCE

The U.S. Department of Energy (DOE) maintains the Federal Radiological Monitoring and Assessment Plan to assist state and local personnel in handling radiological incidents and accidents. Regional offices are located in Oak Ridge, TN.

The Radiation Emergency Assistance Center/ Training Site, Oak Ridge, TN (REAC/TS) is part of the DOE response network.
REAC/TS provides treatment capabilities and consultation assistance on a 24-hour basis, and can be reached through the Oak Ridge Hospital of the Methodist Church, 615-482-2441.

Date Reviewed/Revised 03/99

ASSIGNMENT OF RESPONSIBILITIES

A. **EMERGENCY DEPARTMENT STAFF**

1. Complete notification process Section 9.2, (page 4)

2. Bring stretchers from ED to radiation decontamination area. Drape stretchers with plastic sheets, move to decontamination entrance. Request additional stretchers from escort as needed. Insure all wheels on stretchers used in contaminated area are covered.

3. Assign a TLD badge to each individual who shall come in contact with the patient. Record name and badge number on RADIATION ACCIDENT PARTICIPANTS LOG. (page 30)

4. One ED person shall be assigned to stay outside the decontamination area and act as liaison between the decontamination area and all supplies needed.

5. Two ED nurses shall be assigned to prepare the room and assist as needed. (Any female must comply with pregnancy protocol, (page 18)

   a. Remove all equipment and supplies that are not to be used.
   b. Prepare charts and record all information
   c. Locate and display medical supplies, open as needed.
   d. Dress in protective attire as listed in Section 9.5, (page 19)
   e. Notify ED Physician when patient arrives.
   f. All contaminated clothing and belongings shall be placed in 30 gallon drums.
   g. Assist in collecting and properly labeling all lab specimens. Place all specimens in lead containers. All lead containers must be checked and labeled for radiation contamination levels by the Radiation Safety Specialist in charge, before leaving the morgue.
   h. Retain and store all body excreta. Identify, date, and seal containers. Place RADIOACTIVE sticker on each.

B. **OPERATOR**

1. Complete notification process, (page 4)

2. Know phone numbers assigned to decontamination area to assist in outside communication. (page 5)

3. Notify shift coordinator of any Radiation Accident Personnel you are unable to locate, or who are unable to respond.

C. **FAIRVIEW CLINIC PHYSICIAN ON CALL (IF radiation exposure involves Farley Nuclear Plant.)**

1. Attire in surgical cap, gown, mask, plastic gloves, and plastic shoe covers before entering decontamination area. See Section 9.5, (page 19)

2. Diagnose patient's condition. If patient is stable and ambulatory, direct patient to shower. If patient's condition prevents showering, physician shall direct the decontamination and monitoring process.

3. Proceed with patient care and orders as needed.

4. Decide on disposition: Admission, transfer or release.

5. (For radiation exposure excluding Farley occurrences, the ED Physician shall assume this role.)

D. **SHIFT COORDINATOR/ASSOCIATE ADMINISTRATOR/PATIENT CARE SERVICES**

1. Complete notification process. (page 4)

2. Assist operator in her notification process if necessary.

3. Insure adequate staffing in ED and other affected areas.

4. Insure readiness of decontamination area (morgue)

5. Secure a copy of the ED Communication Receipt Form, and provide information to the Administrator and Social Service Worker.

D. SECURITY SERVICES

1. Two or Three Security Services Representatives should report to the Radiation Accident Triage Area. Notify Director,Supervisors or designee of the incident. Call-in procedure should be followed when appropriate.

2. Lock stairwell as needed to block access to Morgue Decontamination room. Rope-off hallway area as appropriate to keep unauthorized person(s) from entering.

3. One Representative should open outside door to the decontamination area, and leave it ajar. Then maintain vigilance immediately outside door to assist as needed. Control entry into Radiation area. Monitor unauthorized activity around Radiation vehicles and parking area.

4. One Representative should set up a monitor area in the hallway at the entrance to the morgue or EC decontamination room. Control authorized entry. One Representative is stationed inside the double door entrance to provide back-up assistance to the two other representatives as needed.

5. YOUR RESPONSIBILITY IS TO CONTROL ENTRY INTO THE DECONTAMINATION AREA. ENTRY IS DENIED IF THE PERSON IS NOT PROPERLY ATTIRED. SEE SECTION 9.5 (page 19). NO ONE IMPROPERLY ATTIRED SHOULD CROSS THE CONTROL LINE.

6. Assist in transporting patient to designated area, room, Unit or MAST pad as needed.

7. Security Services should maintain vigilance until the Nuclear Medicine Director has declared the area free of radioactivity.

8. Notify the Community Relations representatives in the media Control Center when members of the media arrives. The media should not be allowed in the area.

E. **PLANT SAFETY DIRECTOR**

1. Inspect the Radiation Accident Triage Area for readiness and compliance to written protocols. Carry disaster phone to Decontamination Area and plug into spare jack.

2. Distribute monitor badges (NOTE: This is for drills only).

3. Assign responsibilities to designated drill monitors (Quality Management Personnel or Risk Management Personnel. See that someone takes responsibility for each department assigned specific tasks.

4. Ensure that written documentation of entire process is being undertaken by designated monitors.

5. Assist as necessary. Assume the position of Public Informations Officer if no one is available from Community Relations. (See section 9.3 K, page 13)

6. Schedule and conduct a follow-up Critique Committee for recommendations and action to improve the effectiveness of the plan. Assign minutes to be taken to record problems identified and action plan to correct them.

F. **ENGINEERING**

1. Install and set-up portable containment and decon systems. (Portable patient basket and plastic containmentjug/drum.

2. Place 30 gallon waste container outside the hospital at the decontamination entrance. Tape a large plastic bag to wall near entrance.

3. Place two 30 gallon containers in the decontamination area and label them (CLOTHING /BELONGINGS) and (TRASH)

4. Place plastic sheeting on floor of the decontamination area and corridor to exit. Cut plastic sheeting around floor drains and tape in place. Tape all seams. Cover commode [unit not connected to containment tank]). Place step-off pads at decontamination area door and corridor to exit.

5. TAPE OFF LINE ON FLOOR OUTSIDE DECONTAMINATION AREA (THE CONTROL LINE) TO DELINEATE CONTROLLED ACCESS AREA.

F. **ENGINEERING (continued)**

6. Cover wheels of all carts, stretchers, portable x-ray equipment, etc., in contaminated area.

7. Ask Nuclear Medicine Director whether to seal off floor drains and ventilator system or not.

    1. When a concern of major airborne radiation contamination exists:
        a. Switch off air returns
        b. Switch off heating/cooling system

8. Setup air sampler and load sample filter in filter head.
9. Set up portable ventilator unit and ventilator duct.

10. Assist as needed throughout Radiation Disaster.

11. ALL waste materials are to be secured and disposed of as directed by the Nuclear Medicine Director.

12. After the area has been declared radiation free, insure that the ventilator and water system have been properly returned to normal operation.

G. **ADMINISTRATOR**

1. Complete notification procedure (page 4)
   Verify attendance to accident by SAMC team of Radiation Specialists.

2. Establish the Control Center in the Emergency Services Conference Room for any necessary administrative decisions. (extension 8909 Dedicated Line.)

3. Coordinate Dothan Police Department assistance as needed.

4. Disseminate information to news media .(FOR EVENTS INVOLVING FARLEY NUCLEAR PLANT, COORDINATE PRESS RELEASES WITH THE ALABAMA POWER COMPANY (APC) CORPORATE INFORMATION MANAGER (Office 1-205-257-2386) THE SOUTHERN NUCLEAR OPERATING COMPANY PUBLIC AFFAIRS MANAGER (Office 1-205-992-5752), OR THE SOUTHERN NUCLEAR OPERATING COMPANY EMERGENCY PLANNING COORDINATOR (Office 1-205-992-5627, Home - 1-205-987-1672, Pager 1-205-992-7243 #5627) prior to release. Information releases by SAMC should relate only to patient condition and/or prognosis.

H. RADIATION SPECIALISTS

1. The Radiation specialist team shall consist of the Nuclear Medicine Technical Director, the Radiology Technical Director, the Radiation Oncology Technical Director and the Radiation Oncology Physicist. (IF EVENT INVOLVES FARLEY NUCLEAR PLANT, THE SOUTHERN NUCLEAR OPERATING COMPANY HEALTH PHYSICS TECHNICIAN(S) SHALL ALSO BE A PART OF THIS TEAM.)

2. The Nuclear Medicine Technical Director shall be responsible for the decision making, assigning duties as needed. If he is unavailable, the Radiation Oncology Physicist shall assume his responsibility.

3. Assignments of responsibility shall include the following:

A. **EMPLOYEE SAFETY:** This person is responsible for recording the names of all persons coming into contact with the radiation victim, or entering the Radiation Decontamination room. He shall record their radiation exposure as measured by direct reading dosimeters, personnel monitors or film badges. He shall make decisions regarding exposure based on the following the limits:

(1) 3 rem--If there is an adequate number of attendants such that rotation may be accomplished without further endangering the patient.

(2) 5 rem--If the number of attendants is limited such that personnel cannot be rotated.

(3) 25 rem--to save a life.

B. **VICTIM SAFETY:** This person is responsible for continual radiation readings on the injured patient, and assisting in decisions regarding the decontamination procedures in his best interest. This person will assist the nurse in labeling all samples taken from the patient for diagnosis and treatment, with appropriate radiation levels recorded.

H. **RADIATION SPECIALISTS (continued)**

C. **RADIATION CONTAINMENT:** This person shall be responsible for measuring radiation levels on all people and specimens leaving the Decontamination area, and shall oversee decontamination to acceptable levels. Position yourself at or near the Control Line.

(1) Personnel and equipment shall be decontaminated so that no radiation in excess of 100 cpm above background is detectable by a GM Survey Meter.

(2) Contaminated specimens shall be placed in lead containers and labeled before leaving the area. The outside of the lead container shall be checked for radiation and, if necessary, decontaminated with water before leaving the area.
Any specimens sent to the lab must have amount of radiation each specimen is releasing listed on the lab request form.

(3) Should the physician decide that the victim must be sent to the OR, or any other area, without first being decontaminated, the following procedure shall apply:
(THE RADIATION CONTAINMENT SPECIALIST SHALL BE RESPONSIBLE FOR IMPLEMENTING...)

a. The contaminated portions of the victim shall be covered with two layers of protective covering, such as one cotton sheet and one plastic sheet.

b. If the victim is exhaling radiation, the victim and all attending personnel must wear surgical masks.

c. The victim shall be transferred to a clean stretcher prior to transport.

d. Hallways and all areas affected by transport shall be monitored for radiation and levels recorded.

I. **CENTRAL STERILE**

1. Bring crash cart to ED personnel outside of decontamination area door, as soon as notification is received of Radiation accident.

J. **LABORATORY**

1. Report to the Radiation Accident Decontamination Area with any equipment needed for specimen collection.

2. Specimens shall be collected by nurse inside decontamination area. If absolutely necessary for Lab Tech to enter, he must don proper attire (see page 19)

3. All specimens shall be monitored for radioactivity and labeled before leaving decontamination area. Transport in lead container if Radiation specialist deems necessary.

4. All Lab Techs handling the sample must wear monitoring devices.

5. (IF FARLEY NUCLEAR PLANT OCCURRENCE, SOUTHERN NUCLEAR OPERATING COMPANY HEALTH PHYSICS TECHNICIAN(S) SHOULDACCOMPANY THE SAMPLE TO AND THROUGH THE LAB IF SUFFICIENT PERSONNEL AVAILABLE.)

K. **COMMUNITY RELATIONS**

1. Establish a Media Control Center on the first floor of the Behavioral Medicine Department where a representative will act as liaison between the media and the Disaster Control Center.

2. Notify Security Services and Communications of the location of the Media Control Center. Advise Security Services to direct/escort the media to the media Control Center. Communications is to direct all media-related calls to the Community Relations Representative in the Medica Control Center.

3. Assign another Community Relations Representative to the Emergency Department where they will serve as the link from the ED to the Media Control Center. This individual will be responsible for furnishing regular disaster updates.
4. (IF FARLEY NUCLEAR PLANT OCCURRENCE, REFER INQUIRIES TO ALABAMA POWER COMPANY PUBLIC RELATIONS DEPARTMENT (1-205-257-2386)

5. Keep Disaster Control Center (8909/8918/8919) advised of any changes in condition of radiation accident.

6. Submit all information to Disaster Control Center prior to release to media.

7. If the Community Relations Director cannot be reached, attempts to contact an alternate person from Community Relations. If no one available from this department, the Safety Director shall assume the role of Public Relations Information Officer.

L. SOCIAL SERVICES AND CASE MANAGEMENT

1. Report to the Disaster Control Center, and check in with the administrator on call.

2. Serve as liaison between patients, families, friends and disaster relief agencies. Ameliorate psychosocial problems related to emergency hospitalization.

3. Specially prepared packets containing emergency information shall be used to aid disaster victims.

M. REGISTRATION AREAS

1. Contact the Nursing Administrator in the Control Center to assess need for rooms. If necessary:

   a. Provide for the availability of rooms designated for radiation decontamination patients.

   b. If patient is critical, provide for availability of Room #1 in ICU.

   c. Notify housekeeping to remove all nonessential furniture and/or equipment from needed rooms.

2. Upon admission of the patient:

   a. Complete necessary admission paperwork with family member or ED staff.

   b. If this is a simulation only, do not enter in computer.

N. **RADIOLOGY**

1. Radiology need not report until notified of necessity by Control Center.

2. Report to ED triage area with portable x-ray equipment.

3. Don proper protective attire (see page 19). Also wear a lead apron and lead gloves.

4. If x-raying an imbedded radioactive object or an area containing radioactive contamination, two pictures at 90 degree angles shall be made.

5. The portable equipment shall remain in the triage area until it can be decontaminated to a safe level.

6. Should the physician order an x-ray other than on portable equipment, the patient shall be transported to the Emergency Department x-ray room.

O. **DOTHAN POLICE DEPARTMENT**

1. Administrator shall notify the Dothan Police if their assistance is needed for the following:

   a) Traffic control outside the physical plant.
   b) Traffic control within the hospital.
   c) To secure patient vehicle after transport.

P. **SURGICAL SERVICES**

1. If surgery is necessary, the physician shall notify the anesthesiologist, and the director of Surgical Services to inform them of the estimated time of arrival to the OR.

2. Patient shall be transported to OR #2.

3. ALL personnel entering the OR shall be required to wear one surgical gown and one scrub suit in addition to shoe covers, mask and cap. Pant legs or scrub suits shall be taped snugly around the ankle.

4. ALL unnecessary equipment and supplies shall be removed from the OR before the patient arrives.

5. Once the patient has entered the room, no instruments, equipment, specimens, or personnel are to leave the room without being monitored, radiation levels documented, and disposition dictated by the Radiation Specialist.

6. One circulating nurse shall remain outside the OR to assist.

7. The patient shall be recovered in the OR before transport to room or ICU.

8. After recovery, the patient shall be transferred to a clean stretcher. Radiation Specialist shall accompany patient.

9. The Radiation Specialist shall monitor each person that leaves the room for contamination.

10. ALL instruments, equipment, soiled linen, trash, and scrubs shall remain in the OR to be bagged and disposed of by Radiation Specialist.

11. The door of the operating room shall be closed and the room "OFF LIMITS" until deemed safe to re-enter by the Radiation Specialist.

RADIATION ACCIDENT PLAN
Section 9.4
SIGN USAGE

In the event of a radiation accident, a copy of the universally adopted yellow radioactive materials CAUTION sign shall be posted by the Security Services Personnel.

Section 9.41
PREGNANCY PROTOCOLS

Any female who is pregnant and/or has the possibility of being pregnant should not participate in the Radiation Accident Plan. It is the responsibility of the supervisor of each service involved in the Radiation Accident Plan to be selective in his/her assignments and to question the pregnancy status of any female involved.

Section 9.42
ELEVATOR USE

During the activation of the Radiation Accident Plan, elevator use should be kept to a minimum to allow for patient transport and movement of supplies or equipment.

1. Elevator "B" shall be used for transport of radiation victim to OR, ICU, or a room. The elevator shall then be marked off limits until radiation levels in that unit are cleared with the Radiation Specialist.

2. Elevator "7" shall be used as a back up if needed.

Section 9.5
PROTECTIVE ATTIRE FOR PERSONNEL

All personnel coming in contact with the radiation victim, or entering the Decontamination Area must dress in protective attire before crossing the "CONTROL LINE."

A. **PROTECTIVE ATTIRE INCLUDES:**

1. Surgical clothing (scrub suit, gown, mask, and head cover.)
2. Waterproof shoe covers
3. Cover all seams and cuffs with masking or adhesive tape.
4. Two pair of surgical gloves shall be worn. The first pair should be under the arm cuffs and taped securely.
5. The second pair of gloves should be easily removable and be replaced when they become contaminated.
6. A radiation dosimeter shall be assigned to each team member, attached to the outside of the surgical gown at the neck where it can be easily read and removed.
7. If available, a film badge can be worn under the surgical gown.
8. Waterproof aprons should be worn by any team members using liquid in the decontamination process.
9. THIS PROTECTIVE CLOTHING IS EFFECTIVE IN STOPPING ALPHA AND BETA PARTICLES BUT NOT GAMMA RAYS.
10. Decrease your chances of radiation contamination by limiting the time, distance, and quantity of exposure to the sources of radiation as much as possible.

B. **PROCEDURE FOR EXITING DECONTAMINATION AREA:**

1. Remcve outer gloves, turning them inside-out as they are pulled off.
2. Give dosimeter to Radiation Specialist. Ensure final dose data is recorded.
3. Remove all tape at pants cuffs and sleeves.
4. Remove coveralls turning them inside out. Avoid shaking.
5. Remove headcover and mask.
6. Remove shoe cover from one foot and get it monitored. If foot is clean, step the verified clean foot only over the the control line and onto a clean step-off pad.
7. Repeat step 6 for other foot.
8. Remove inner gloves
9. Conduct total-body radiological survey of each team member
10. If directed by the Radiation Specialist, take shower at the specified location, after exiting.

DECONTAMINATION OF THE RADIATION PATIENT

In general, contaminated wounds and body orifices are decontaminated first, followed by areas of highest contamination levels on the intact skin. The purpose of decontamination is to prevent or reduce incorporation of the material (internal contamination), to reduce the radiation dose from the contaminated site to the rest of the body, to contain contamination, and to prevent its spread.

A. **GENERAL BODY DECONTAMINATION PROCEDURE**

1. Survey the entire body and record findings on anatomical chart.
2. Visibly mark (as with lipstick or marker) very high level areas to receive priority.
3. Contaminated patients should shower if able, using detergent of a decontaminate solution. Caution them to avoid getting water in body orifices, or to spread contamination to hairy areas initially free from radioactivity.
4. Repeat above steps.
5. Proceed to next pages as needed.

B. TREATMENT OF CONTAMINATED WOUNDS

1. Assume wounds are contaminated until proven otherwise.

2. It is important to consult experts as soon as possible and to initiate measures that prevent or minimize uptake of the radioactive material into body cells or tissues.

3. Drape the wound with waterproof material

4. Gently irrigate with Normal Saline, or a 3% hydrogen peroxide solution. Collect all irrigation fluid for radiation monitoring.

5. More than one irrigation is usually necessary. Monitor for radiation levels after each irrigation.

6. Continue process until no change is seen in radiation levels.

7. After medical treatment is completed, cover wound with waterproof covering to prevent further spread of contamination.

8. If radiation levels are still dangerously high, surgical decontamination may be indicated (surgical debridement.)

C. **DECONTAMINATION OF BODY ORIFICES**

1. Contaminated body orifices, such as the mouth, nose, eyes, and ears, need special attention because absorption of radioactive material is likely to be much more rapid in these areas than through the skin.

2. If radiation is detected in oral cavity, have patient brush teeth with toothpaste, and rinse mouth with 3% citric acid solution.

3. Contaminated pharyngeal region may be treated by gargling with 3% hydrogen peroxide solution.

4. If radiation has been swallowed, gastric lavage may be indicated.

5. Nose may be rinsed out with normal saline or tap water.

6. Eyes should be flushed generously with normal saline, from inner to outer aspect.

7. Ears should be irrigated using ear syringe, if tympanic membrane is intact.

8. Reserve all irrigants for radiation detection, and continue irrigating until readings no longer improve.

D. **DECONTAMINATION OF INTACT SKIN**

1. Begin with the least aggressive method, and progress to more aggressive methods as needed.

2. Limit mechanical and chemical abrasion to the skin as much as possible.

3. Use warm solutions. Cold solutions will close the pores and trap radioactive material within them. Hot solutions increases blood flow and would enhance absorption of radioactive material.

4. Use warm water and surgical brush first. Scrub for 3 to 4 minutes. Rinse for 2 to 3 minutes. Dry. Check for radiation levels. Repeat.

5. Ph neutral soap, sodium hypochlorite (diluted 1/10 in water), powdered detergent mixed with cornmeal and made into a paste by adding water, or more aggressive measures (see Farley Emergency Plan Training page 20) may be tried.

6. The decontamination process stops when the radioactive level cannot be reduced to a lower level.

E. **DECONTAMINATION OF INTACT SKIN IN HAIRY AREAS**

1. Wrap or position patient to avoid spread of contamination.

2. Wash with Phisohex

3. Dry with an uncontaminated towel

4. Do not shave hair (unless area is contaminated with an alpha-emitter, such as plutonium, then only as a last resort.) Hair may be cut, but do not injure skin.

F. TREATMENT OF PATIENT WITH INTERNAL CONTAMINATION

1. See Farley Emergency Plan Training page 22, for specific agents used to decorporate various radionuclides.

2. Time may be a vital element in treatment of patients with internal contamination, since radioactive materials cross cell membranes at different rates.

3. The physician or Radiation Safety Officer shall request samples of urine, feces, vomitus, or wound secretions, as well as whole body assays, if internal contamination is suspected.

RADIATION ACCIDENT PLAN
Section 9.7
EQUIPMENT AND SUPPLIES
location--morgue area

DESCRIPTION	QUANTITY
Applicators, cotton tip, pkg.	1
Bags, Plastic	20
Basin	1
Blankets	6
Brushes, hand	2
Charger, Dosimeter	1
BatteSw Compartment operational	
Clippers, Hair	1
Containers, specimen	10
Cotton Balls, box	1
Decontaminating solution, bottle	1
Detergent soap, box	1
Dosimeter, Pocket (5R)	5
Drums, waste	3
Filter paper, box	2
IV Poles	2
Knifeblades #11 and #15	2
Labels, self sticking "RADIOACTIVE" roll	1
Lead container "pig"	1
Mask, surgeons, face	4
Needles, pkg	1
Paper, absorbent, roll	1
Poly sheets, roll	1
Protective clothing:	
Lab Coats	6
Rubber gloves, pr	20
Surgeons gloves, pr	8
Plastic shoe covers, pr	20
Surgeons Cap	4
Surgeons gown	4
Plastic surgical drape with adhesive	1
Record Materials	
Clipboard, paper, pencil	3
Logbook	1
Pen, with waterproof ink	1
Survey forms, 1 set	1
Rope, Radiation 100	1
Scissors, Metzenbalm, small	1
Scissors, sewing	1
Signs, Radiation	10
Specimen bottle, sterile	1
Specimen bottle	1
Suits, surgical	10
Survey Meter, G.M.	1
Pancake probe	1

EQUIPMENT AND SUPPLIES
location--morgue area

DESCRIPTION	QUANTITY
Medical probe	1
Calibration O.K.	1
Survey instrument--Ion chamber	1
Calibration O.K.	1
Suture--4 Ethicon	1
Suture set	1
Syringe bulb	1
Tags	10
Tape, masking, roll	2
TLDs	20
Calibration O.K.	1
Murphy Kelly forceps, curved 5 1/2	3
Murphy Kelly forceps, straight 5 1/2	2
Dressing forceps, no teeth	1
Adron forceps, with mouse teeth	1
Adron forceps, without teeth	1
Needle holder 5"	1
Needle holder 6"	1
Mosquito forceps, straight	3
Towel clips, Backhaus	2
Allis forceps (4x5) 5 1/2	1
Operating scissors S&B 5 1/2	1
#3 Knife Handle	1
Butcher Tray 19x12 1/2x 5/8"	1
Medicine cup	1
Syringe 2cc	1
Syringe 10cc	1
Hyponeedle, reusable 22G	1
Hyponeedle, reusable 25G	1
Red bags	4
Step-off pads	2
Herculite	1
Tyveks coveralls (white) case	2
Bandage scissors	2
Utility scissors	1
BP Cuff	3
Stethoscope	3
Oral thermometer box	1
Pen light	4
Sample bucket	1
Sample bottle	4
Xylocaine 2% with Epinephrine, bottle	1

FORM

1. Nature of INCIDENT: ______________________________

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2. Number of Casualties: ______________________________

3. Extent of Injuries: ______________________________

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4. Level of Radioactivity : ______________________________

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5. Personnel Involved: ______________________________

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6. Routing System Utilized: ______________________________

7. Procedural Errors: ______________________________

8. Communications: ______________________________

9. Involvement of Outside Agencies: ______________________________

10. Additional Comments: ______________________________

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RECOMMENDATIONS: ______________________________

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SIGNED: ____________________ DATE: ____________________
Drill Monitor

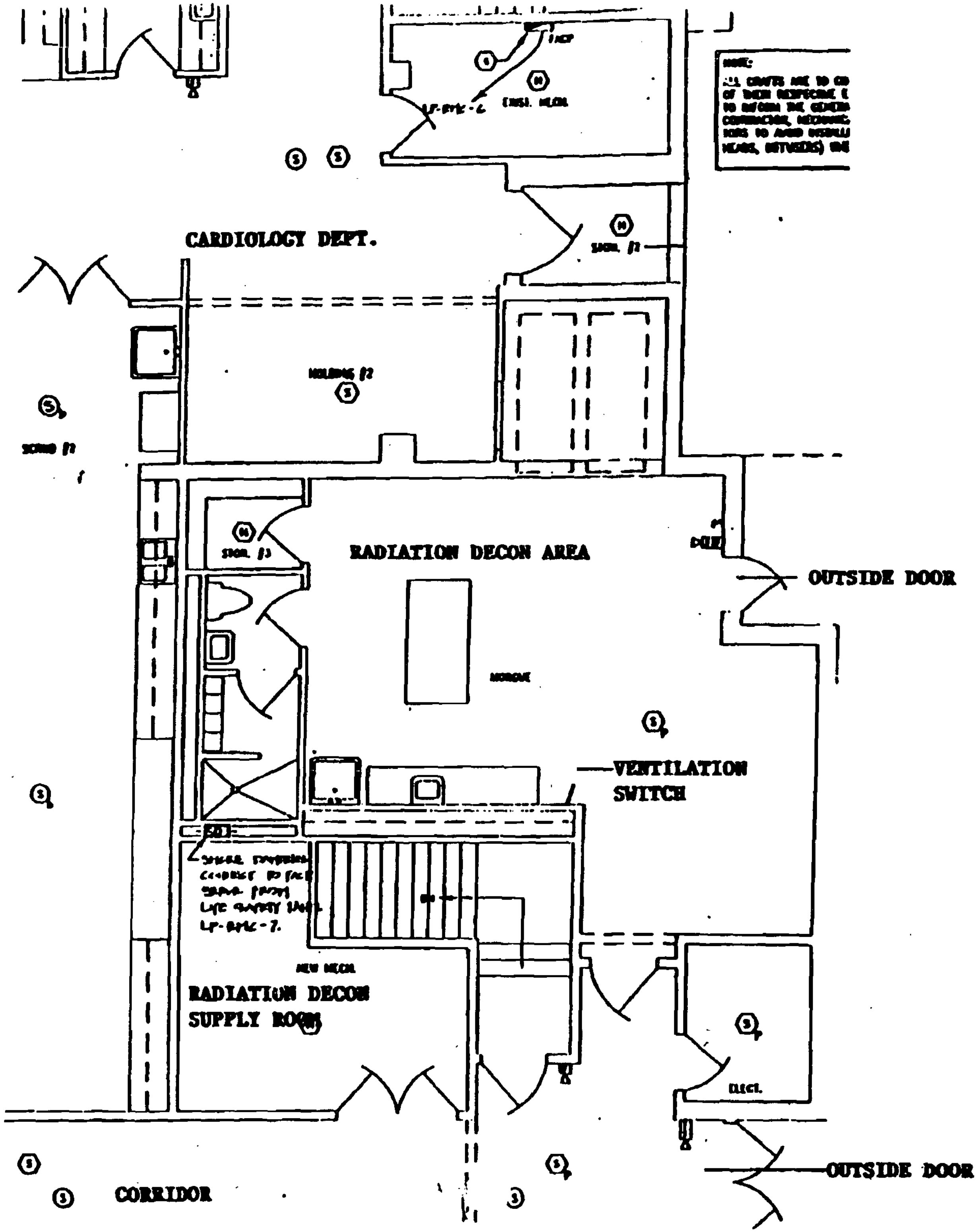
SIGNED: ____________________ DATE: ____________________
Director, Quality Review

RADIATION ACCIDENT DRILL
PARTICIPANT LOG
Section 9.8 (cont'd)

EMPLOYEE	DEPARTMENT
1. ______	
2. ______	
3. ______	
4. ______	
5. ______	
6. ______	
7. ______	
8. ______	
9. ______	
10. ______	
11. ______	
12. ______	
13. ______	
14. ______	
15. ______	
16. ______	
17. ______	
18. ______	
19. ______	
20. ______	
21. ______	
22. ______	

Section 9.9

BADGE NUMBER			NAME/TITLE SOCIAL SECURITY #	DOSIMETER READING		TOTAL
TLD	RING	DOSIM.		IN	OUT	


CARDIOLOGY DEPT.
RADIATION DECON AREA
OUTSIDE DOOR
VENTILATION SWITCH
RADIATION DECON SUPPLY ROOM
CORRIDOR
OUTSIDE DOOR

APPENDIX B

Letters of Agreement on File

The following letters of agreement and memorandums of understanding are maintained on file with the Emergency Planning Coordinator:

Agreement Between APCo and the Board of Trustees of the University of Alabama to Provide for a Radiation Casualty Treatment Facility at University Hospital, Birmingham to Accomodate the Radiation Emergency Medical Plans and Needs of Alabama Power Company (01-01-87) Amendment (3/12/90)

Letter of Agreement Between Careline of Alabama Ambulance Service and SNC (1-10-95)

Letter - Southeast Alabama Medical Center (02-12-2004)

Letter - Radiation Emergency Assistance Center Training Site(REAC/TS)(12-18-2000)

Letter of Agreement Between Dothan Ambulance Service, Inc. and APCo (10-01-1986)

Assignment of Emergency Planning Agreements

Letter of Agreement between Ashford Rescue Squad and Southern Nuclear Operating Company

Letter of Agreement between Columbia Rescue Squad and Southern Nuclear Operating Company

EMERGENCY ACTION MANUAL

POLICIES AND PROCEDURES

The policies and procedures of this Emergency Action Manual have been reviewed, revised as necessary, and approved by appropriate authorities. This current edition becomes effective January, 1998 and supersedes any previous editions.

Review Date: January, 1999

Ronald S. Owen
Chief Executive Officer

James C. Jones, D.O.
President Medical Staff
~~Medical Director~~
Emergency Department

Wanda Fassett
Quality Management

Jerry Blevins
Division Director
Facilities Management

Diane Buntyn
Patient Care Services
Administration

C. Wayne Hannah, M.D., J.D.
Medical Director

Bruce McNeal
Director of Safety

Lesia Hollis
Director of Security

Anna Smith
Radiation Safety Officer

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TABLE OF CONTENTS

RADIATION ACCIDENT PLAN
Section 9.1

INTRODUCTION

It is imperative that Southeast Alabama Medical Center have an operational plan to safely handle any radiation accidents, even though the possibility of such occurrences is remote.

Because of the proximity to Farley Nuclear Plant, Southeast Alabama Medical Center has a written agreement with the Southern Nuclear Operating Company to act as a casualty treatment center for any events occurring at that facility. The hospital, medical staff and multidisciplinary staff will be available to persons who have been exposed to serious radioactive contamination or suffer from radiation injury.

This plan will be written for radiation injury patients in general, and any policies specific to the treatment of Farley Nuclear Plant occurrences will be written in parentheses, and can be ignored if the injury was sustained elsewhere.

LOCATION OF THE DECONTAMINATION AREA

1) Two designated areas have been established to handle injured patients with radiation contamination. The morgue as well as the Emergency Center decontamination room has been designated as areas for decontamination and treatment of radiation victims. If an alternative location for decontamination needs to be used, the Emergency Center Physician will so designate.

2) The Emergency Center Physician will identify which decon area will be established. In the event of multiple contaminated patients, both decon areas may be established

3) The radiation decon supply room, located outside the Morgue, will serve as the supply room for both designed areas.

4) The hallways outside the decontamination areas may be used as a holding area.

5) Overflow patients are to be transported to the University of Alabama Hospital in Birmingham via MAST.

6) Large numbers of contaminated victims will be treated or held in the Wiregrass Recreation Center, located on Sixth Avenue, Dothan, Alabama.

E.D. COMMUNICATIONS RECEIPT FORM POLICY

Upon receipt of information regarding radiation accident occurrence, the person receiving the information shall be responsible for the completion of the E.D. Communications Receipt Form. (next page)

1) Verify the validity of the accident by returning a call to the reporting person or company.

2) Complete the form with as much information as available.

3) Forward the completed form promptly to the shift coordinator.

ED COMMUNICATION RECEIPT FORM

Obtain the following information from the radiation accident scene:

1. Number of casualties: ______________________

2. Estimate of the severity of injuries: (Notify Fairview Clinic Physician of this estimate): ______________________

____

____

3. Name(s), age(s), sex(s) of casualties (if possible):

NAME	AGE/SEX

4. Method of transport to Southeast Alabama Medical Center:

____

5. Present Location of Casualties: ______________________

____

6. Estimated Time of Arrival: ______________________

ED STAFF TO VERIFY NOTIFICATION BY IMMEDIATELY RETURNING CALL TO RADIATION ACCIDENT SCENE: (IF AT FARLEY NUCLEAR PLANT: 793-2255, (334)899-5156, EXT. 2355 UNIT I, EXT. 2353 UNIT II).

NOTIFICATION PROCESS
RADIATION ACCIDENT SCENE PERSONNEL

A. EMERGENCY DEPARTMENT STAFF (WILL NOTIFY THE FOLLOWING)

1. ED Physician
2. Operator (request operator to initiate the announcement/notification process for a radiation accident.)
3. (Fairview Clinic Physician on call, 8697 or 794-3192 **IF Radiation Exposure involves Farley Nuclear Plant**)
4. Shift coordinator

B. OPERATOR (WILL NOTIFY THE FOLLOWING)

1. Security (8014)
2. Plant Safety Director (8920)
3. Engineering (8766)
4. Administrator (8701) or Administrator on call from list
5. Technical Director Radiation Oncology (8080)
6. Radiation Oncology Physicist (8080)
7. Radiology Technical Director (8843)
8. Nuclear Medicine Technical Director (8077)
9. Central Sterile (8075)
10. Laboratory (8045)
11. Community Relations (8107)
12. Social Services (8070)
13. Admitting and Discharge (8754)
14. Quality Management Director (8862)
15. Risk Management-Hannah (8705)
16. Behavioral Medicine (8858)

C. SHIFT COORDINATOR (WILL NOTIFY THE FOLLOWING)

1. Patient Care Services Administration (8734)
2. Unit Director or designee of designated area receiving patient
3. Surgical services (if surgery is indicated: 8033)

D. ADMINISTRATOR (WILL NOTIFY THE FOLLOWING)

1. Dothan Police (if necessary; 911 or 793-0100)
2. Alabama Health Department, Radiation Control division (334-206-5391). After hours, use the Radiological Emergency Assistance telephone directory, published by the Alabama State Board of Health (page 34) or call 334-242-4378 and ask operator to page 971)

RADIATION ACCIDENT PLAN
Section 9.22
COMMUNICATION

DECONTAMINATION AREA PHONES

Inside morgue	8935
Radiation supply room	8745
Emergency Center Decon room	712-3326

ADDITIONAL DISASTER CONTROL AREA PHONES

Disaster Control Center	8909
Media Control Center	3402
Family Receiving Control	3401
Employee Pool	3403

Dissemination of information: All information released must come directly from the administrator on call.

Section 9.23
COMMUNICATION: SOURCES OF ASSISTANCE

The U.S. Department of Energy (DOE) maintains the Federal Radiological Monitoring and Assessment Plan to assist state and local personnel in handling radiological incidents and accidents. Regional offices are located in Oak Ridge, TN.

The Radiation Emergency Assistance Center/ Training Site, Oak Ridge, TN (REAC/TS) is part of the DOE response network.
REAC/TS provides treatment capabilities and consultation assistance on a 24-hour basis, and can be reached through the Oak Ridge Hospital of the Methodist Church, 615-482-2441.

Date Reviewed/Revised 03/99

ASSIGNMENT OF RESPONSIBILITIES

A. **EMERGENCY DEPARTMENT STAFF**

1. Complete notification process Section 9.2, (page 4)

2. Bring stretchers from ED to radiation decontamination area. Drape stretchers with plastic sheets, move to decontamination entrance. Request additional stretchers from escort as needed. Insure all wheels on stretchers used in contaminated area are covered.

3. Assign a TLD badge to each individual who shall come in contact with the patient. Record name and badge number on RADIATION ACCIDENT PARTICIPANTS LOG. (page 30)

4. One ED person shall be assigned to stay outside the decontamination area and act as liaison between the decontamination area and all supplies needed.

5. Two ED nurses shall be assigned to prepare the room and assist as needed. (Any female must comply with pregnancy protocol, (page 18)

   a. Remove all equipment and supplies that are not to be used.
   b. Prepare charts and record all information
   c. Locate and display medical supplies, open as needed.
   d. Dress in protective attire as listed in Section 9.5, (page 19)
   e. Notify ED Physician when patient arrives.
   f. All contaminated clothing and belongings shall be placed in 30 gallon drums.
   g. Assist in collecting and properly labeling all lab specimens. Place all specimens in lead containers. All lead containers must be checked and labeled for radiation contamination levels by the Radiation Safety Specialist in charge, before leaving the morgue.
   h. Retain and store all body excreta. Identify, date, and seal containers. Place RADIOACTIVE sticker on each.

B. **OPERATOR**

1. Complete notification process, (page 4)

2. Know phone numbers assigned to decontamination area to assist in outside communication. (page 5)

3. Notify shift coordinator of any Radiation Accident Personnel you are unable to locate, or who are unable to respond.

C. **FAIRVIEW CLINIC PHYSICIAN ON CALL (IF radiation exposure involves Farley Nuclear Plant.)**

1. Attire in surgical cap, gown, mask, plastic gloves, and plastic shoe covers before entering decontamination area. See Section 9.5, (page 19)

2. Diagnose patient's condition. If patient is stable and ambulatory, direct patient to shower. If patient's condition prevents showering, physician shall direct the decontamination and monitoring process.

3. Proceed with patient care and orders as needed.

4. Decide on disposition: Admission, transfer or release.

5. (For radiation exposure excluding Farley occurrences, the ED Physician shall assume this role.)

D. **SHIFT COORDINATOR/ASSOCIATE ADMINISTRATOR/PATIENT CARE SERVICES**

1. Complete notification process. (page 4)

2. Assist operator in her notification process if necessary.

3. Insure adequate staffing in ED and other affected areas.

4. Insure readiness of decontamination area (morgue)

5. Secure a copy of the ED Communication Receipt Form, and provide information to the Administrator and Social Service Worker.

D. SECURITY SERVICES

1. Two or Three Security Services Representatives should report to the Radiation Accident Triage Area. Notify Director,Supervisors or designee of the incident. Call-in procedure should be followed when appropriate.

2. Lock stairwell as needed to block access to Morgue Decontamination room. Rope-off hallway area as appropriate to keep unauthorized person(s) from entering.

3. One Representative should open outside door to the decontamination area, and leave it ajar. Then maintain vigilance immediately outside door to assist as needed. Control entry into Radiation area. Monitor unauthorized activity around Radiation vehicles and parking area.

4. One Representative should set up a monitor area in the hallway at the entrance to the morgue or EC decontamination room. Control authorized entry. One Representative is stationed inside the double door entrance to provide back-up assistance to the two other representatives as needed.

5. YOUR RESPONSIBILITY IS TO CONTROL ENTRY INTO THE DECONTAMINATION AREA. ENTRY IS DENIED IF THE PERSON IS NOT PROPERLY ATTIRED. SEE SECTION 9.5 (page 19). NO ONE IMPROPERLY ATTIRED SHOULD CROSS THE CONTROL LINE.

6. Assist in transporting patient to designated area, room, Unit or MAST pad as needed.

7. Security Services should maintain vigilance until the Nuclear Medicine Director has declared the area free of radioactivity.

8. Notify the Community Relations representatives in the media Control Center when members of the media arrives. The media should not be allowed in the area.

Date Reviewed/Revised: 03/99

E. **PLANT SAFETY DIRECTOR**

1. Inspect the Radiation Accident Triage Area for readiness and compliance to written protocols. Carry disaster phone to Decontamination Area and plug into spare jack.

2. Distribute monitor badges (NOTE: This is for drills only).

3. Assign responsibilities to designated drill monitors (Quality Management Personnel or Risk Management Personnel. See that someone takes responsibility for each department assigned specific tasks.

4. Ensure that written documentation of entire process is being undertaken by designated monitors.

5. Assist as necessary. Assume the position of Public Informations Officer if no one is available from Community Relations. (See section 9.3 K, page 13)

6. Schedule and conduct a follow-up Critique Committee for recommendations and action to improve the effectiveness of the plan. Assign minutes to be taken to record problems identified and action plan to correct them.

F. **ENGINEERING**

1. Install and set-up portable containment and decon systems. (Portable patient basket and plastic containmentjug/drum.

2. Place 30 gallon waste container outside the hospital at the decontamination entrance. Tape a large plastic bag to wall near entrance.

3. Place two 30 gallon containers in the decontamination area and label them (CLOTHING /BELONGINGS) and (TRASH)

4. Place plastic sheeting on floor of the decontamination area and corridor to exit. Cut plastic sheeting around floor drains and tape in place. Tape all seams. Cover commode [unit not connected to containment tank]). Place step-off pads at decontamination area door and corridor to exit.

5. TAPE OFF LINE ON FLOOR OUTSIDE DECONTAMINATION AREA (THE CONTROL LINE) TO DELINEATE CONTROLLED ACCESS AREA.

F. **ENGINEERING (continued)**

6. Cover wheels of all carts, stretchers, portable x-ray equipment, etc., in contaminated area.

7. Ask Nuclear Medicine Director whether to seal off floor drains and ventilator system or not.

    1. When a concern of major airborne radiation contamination exists:
        a. Switch off air returns
        b. Switch off heating/cooling system

8. Setup air sampler and load sample filter in filter head.
9. Set up portable ventilator unit and ventilator duct.

10. Assist as needed throughout Radiation Disaster.

11. ALL waste materials are to be secured and disposed of as directed by the Nuclear Medicine Director.

12. After the area has been declared radiation free, insure that the ventilator and water system have been properly returned to normal operation.

G. **ADMINISTRATOR**

1. Complete notification procedure (page 4)
   Verify attendance to accident by SAMC team of Radiation Specialists.

2. Establish the Control Center in the Emergency Services Conference Room for any necessary administrative decisions. (extension 8909 Dedicated Line.)

3. Coordinate Dothan Police Department assistance as needed.

4. Disseminate information to news media .(FOR EVENTS INVOLVING FARLEY NUCLEAR PLANT, COORDINATE PRESS RELEASES WITH THE ALABAMA POWER COMPANY (APC) CORPORATE INFORMATION MANAGER (Office 1-205-257-2386) THE SOUTHERN NUCLEAR OPERATING COMPANY PUBLIC AFFAIRS MANAGER (Office 1-205-992-5752), OR THE SOUTHERN NUCLEAR OPERATING COMPANY EMERGENCY PLANNING COORDINATOR (Office 1-205-992-5627, Home - 1-205-987-1672, Pager 1-205-992-7243 #5627) prior to release. Information releases by SAMC should relate only to patient condition and/or prognosis.

H. RADIATION SPECIALISTS

1. The Radiation specialist team shall consist of the Nuclear Medicine Technical Director, the Radiology Technical Director, the Radiation Oncology Technical Director and the Radiation Oncology Physicist. (IF EVENT INVOLVES FARLEY NUCLEAR PLANT, THE SOUTHERN NUCLEAR OPERATING COMPANY HEALTH PHYSICS TECHNICIAN(S) SHALL ALSO BE A PART OF THIS TEAM.)

2. The Nuclear Medicine Technical Director shall be responsible for the decision making, assigning duties as needed. If he is unavailable, the Radiation Oncology Physicist shall assume his responsibility.

3. Assignments of responsibility shall include the following:

A. **EMPLOYEE SAFETY:** This person is responsible for recording the names of all persons coming into contact with the radiation victim, or entering the Radiation Decontamination room. He shall record their radiation exposure as measured by direct reading dosimeters, personnel monitors or film badges. He shall make decisions regarding exposure based on the following the limits:

(1) 3 rem--If there is an adequate number of attendants such that rotation may be accomplished without further endangering the patient.

(2) 5 rem--If the number of attendants is limited such that personnel cannot be rotated.

(3) 25 rem--to save a life.

B. **VICTIM SAFETY:** This person is responsible for continual radiation readings on the injured patient, and assisting in decisions regarding the decontamination procedures in his best interest. This person will assist the nurse in labeling all samples taken from the patient for diagnosis and treatment, with appropriate radiation levels recorded.

H. **RADIATION SPECIALISTS (continued)**

C. **RADIATION CONTAINMENT:** This person shall be responsible for measuring radiation levels on all people and specimens leaving the Decontamination area, and shall oversee decontamination to acceptable levels. Position yourself at or near the Control Line.

(1) Personnel and equipment shall be decontaminated so that no radiation in excess of 100 cpm above background is detectable by a GM Survey Meter.

(2) Contaminated specimens shall be placed in lead containers and labeled before leaving the area. The outside of the lead container shall be checked for radiation and, if necessary, decontaminated with water before leaving the area.
Any specimens sent to the lab must have amount of radiation each specimen is releasing listed on the lab request form.

(3) Should the physician decide that the victim must be sent to the OR, or any other area, without first being decontaminated, the following procedure shall apply:
(THE RADIATION CONTAINMENT SPECIALIST SHALL BE RESPONSIBLE FOR IMPLEMENTING...)

a. The contaminated portions of the victim shall be covered with two layers of protective covering, such as one cotton sheet and one plastic sheet.

b. If the victim is exhaling radiation, the victim and all attending personnel must wear surgical masks.

c. The victim shall be transferred to a clean stretcher prior to transport.

d. Hallways and all areas affected by transport shall be monitored for radiation and levels recorded.

I. **CENTRAL STERILE**

1. Bring crash cart to ED personnel outside of decontamination area door, as soon as notification is received of Radiation accident.

J. **LABORATORY**

1. Report to the Radiation Accident Decontamination Area with any equipment needed for specimen collection.

2. Specimens shall be collected by nurse inside decontamination area. If absolutely necessary for Lab Tech to enter, he must don proper attire (see page 19)

3. All specimens shall be monitored for radioactivity and labeled before leaving decontamination area. Transport in lead container if Radiation specialist deems necessary.

4. All Lab Techs handling the sample must wear monitoring devices.

5. (IF FARLEY NUCLEAR PLANT OCCURRENCE, SOUTHERN NUCLEAR OPERATING COMPANY HEALTH PHYSICS TECHNICIAN(S) SHOULDACCOMPANY THE SAMPLE TO AND THROUGH THE LAB IF SUFFICIENT PERSONNEL AVAILABLE.)

K. **COMMUNITY RELATIONS**

1. Establish a Media Control Center on the first floor of the Behavioral Medicine Department where a representative will act as liaison between the media and the Disaster Control Center.

2. Notify Security Services and Communications of the location of the Media Control Center. Advise Security Services to direct/escort the media to the media Control Center. Communications is to direct all media-related calls to the Community Relations Representative in the Medica Control Center.

3. Assign another Community Relations Representative to the Emergency Department where they will serve as the link from the ED to the Media Control Center. This individual will be responsible for furnishing regular disaster updates.
4. (IF FARLEY NUCLEAR PLANT OCCURRENCE, REFER INQUIRIES TO ALABAMA POWER COMPANY PUBLIC RELATIONS DEPARTMENT (1-205-257-2386)

5. Keep Disaster Control Center (8909/8918/8919) advised of any changes in condition of radiation accident.

6. Submit all information to Disaster Control Center prior to release to media.

7. If the Community Relations Director cannot be reached, attempts to contact an alternate person from Community Relations. If no one available from this department, the Safety Director shall assume the role of Public Relations Information Officer.

L. **SOCIAL SERVICES AND CASE MANAGEMENT**

1. Report to the Disaster Control Center, and check in with the administrator on call.

2. Serve as liaison between patients, families, friends and disaster relief agencies. Ameliorate psychosocial problems related to emergency hospitalization.

3. Specially prepared packets containing emergency information shall be used to aid disaster victims.

M. **REGISTRATION AREAS**

1. Contact the Nursing Administrator in the Control Center to assess need for rooms. If necessary:

   a. Provide for the availability of rooms designated for radiation decontamination patients.

   b. If patient is critical, provide for availability of Room #1 in ICU.

   c. Notify housekeeping to remove all nonessential furniture and/or equipment from needed rooms.

2. Upon admission of the patient:

   a. Complete necessary admission paperwork with family member or ED staff.

   b. If this is a simulation only, do not enter in computer.

N. **RADIOLOGY**

1. Radiology need not report until notified of necessity by Control Center.

2. Report to ED triage area with portable x-ray equipment.

3. Don proper protective attire (see page 19). Also wear a lead apron and lead gloves.

4. If x-raying an imbedded radioactive object or an area containing radioactive contamination, two pictures at 90 degree angles shall be made.

5. The portable equipment shall remain in the triage area until it can be decontaminated to a safe level.

6. Should the physician order an x-ray other than on portable equipment, the patient shall be transported to the Emergency Department x-ray room.

O. **DOTHAN POLICE DEPARTMENT**

1. Administrator shall notify the Dothan Police if their assistance is needed for the following:

   a) Traffic control outside the physical plant.
   b) Traffic control within the hospital.
   c) To secure patient vehicle after transport.

RADIATION ACCIDENT PLAN
Section 9.31
ASSIGNMENT OF RESPONSIBILITIES
in the event of surgery

P. SURGICAL SERVICES

1. If surgery is necessary, the physician shall notify the anesthesiologist, and the director of Surgical Services to inform them of the estimated time of arrival to the OR.

2. Patient shall be transported to OR #2.

3. ALL personnel entering the OR shall be required to wear one surgical gown and one scrub suit in addition to shoe covers, mask and cap. Pant legs or scrub suits shall be taped snugly around the ankle.

4. ALL unnecessary equipment and supplies shall be removed from the OR before the patient arrives.

5. Once the patient has entered the room, no instruments, equipment, specimens, or personnel are to leave the room without being monitored, radiation levels documented, and disposition dictated by the Radiation Specialist.

6. One circulating nurse shall remain outside the OR to assist.

7. The patient shall be recovered in the OR before transport to room or ICU.

8. After recovery, the patient shall be transferred to a clean stretcher. Radiation Specialist shall accompany patient.

9. The Radiation Specialist shall monitor each person that leaves the room for contamination.

10. ALL instruments, equipment, soiled linen, trash, and scrubs shall remain in the OR to be bagged and disposed of by Radiation Specialist.

11. The door of the operating room shall be closed and the room "OFF LIMITS" until deemed safe to re-enter by the Radiation Specialist.

RADIATION ACCIDENT PLAN
Section 9.4
SIGN USAGE

In the event of a radiation accident, a copy of the universally adopted yellow radioactive materials CAUTION sign shall be posted by the Security Services Personnel.

Section 9.41
PREGNANCY PROTOCOLS

Any female who is pregnant and/or has the possibility of being pregnant should not participate in the Radiation Accident Plan. It is the responsibility of the supervisor of each service involved in the Radiation Accident Plan to be selective in his/her assignments and to question the pregnancy status of any female involved.

Section 9.42
ELEVATOR USE

During the activation of the Radiation Accident Plan, elevator use should be kept to a minimum to allow for patient transport and movement of supplies or equipment.

1. Elevator "B" shall be used for transport of radiation victim to OR, ICU, or a room. The elevator shall then be marked off limits until radiation levels in that unit are cleared with the Radiation Specialist.

2. Elevator "7" shall be used as a back up if needed.

PROTECTIVE ATTIRE FOR PERSONNEL

All personnel coming in contact with the radiation victim, or entering the Decontamination Area must dress in protective attire before crossing the "CONTROL LINE."

A. **PROTECTIVE ATTIRE INCLUDES:**

1. Surgical clothing (scrub suit, gown, mask, and head cover.)
2. Waterproof shoe covers
3. Cover all seams and cuffs with masking or adhesive tape.
4. Two pair of surgical gloves shall be worn. The first pair should be under the arm cuffs and taped securely.
5. The second pair of gloves should be easily removable and be replaced when they become contaminated.
6. A radiation dosimeter shall be assigned to each team member, attached to the outside of the surgical gown at the neck where it can be easily read and removed.
7. If available, a film badge can be worn under the surgical gown.
8. Waterproof aprons should be worn by any team members using liquid in the decontamination process.
9. THIS PROTECTIVE CLOTHING IS EFFECTIVE IN STOPPING ALPHA AND BETA PARTICLES BUT NOT GAMMA RAYS.
10. Decrease your chances of radiation contamination by limiting the time, distance, and quantity of exposure to the sources of radiation as much as possible.

B. **PROCEDURE FOR EXITING DECONTAMINATION AREA:**

1. Remcve outer gloves, turning them inside-out as they are pulled off.
2. Give dosimeter to Radiation Specialist. Ensure final dose data is recorded.
3. Remove all tape at pants cuffs and sleeves.
4. Remove coveralls turning them inside out. Avoid shaking.
5. Remove headcover and mask.
6. Remove shoe cover from one foot and get it monitored. If foot is clean, step the verified clean foot only over the the control line and onto a clean step-off pad.
7. Repeat step 6 for other foot.
8. Remove inner gloves
9. Conduct total-body radiological survey of each team member
10. If directed by the Radiation Specialist, take shower at the specified location, after exiting.

RADIATION ACCIDENT PLAN
Section 9.6
DECONTAMINATION OF THE RADIATION PATIENT

In general, contaminated wounds and body orifices are decontaminated first, followed by areas of highest contamination levels on the intact skin. The purpose of decontamination is to prevent or reduce incorporation of the material (internal contamination), to reduce the radiation dose from the contaminated site to the rest of the body, to contain contamination, and to prevent its spread.

A. **GENERAL BODY DECONTAMINATION PROCEDURE**

1. Survey the entire body and record findings on anatomical chart.

2. Visibly mark (as with lipstick or marker) very high level areas to receive priority.

3. Contaminated patients should shower if able, using detergent of a decontaminate solution. Caution them to avoid getting water in body orifices, or to spread contamination to hairy areas initially free from radioactivity.

4. Repeat above steps.

5. Proceed to next pages as needed.

B. **TREATMENT OF CONTAMINATED WOUNDS**

1. Assume wounds are contaminated until proven otherwise.

2. It is important to consult experts as soon as possible and to initiate measures that prevent or minimize uptake of the radioactive material into body cells or tissues.

3. Drape the wound with waterproof material

4. Gently irrigate with Normal Saline, or a 3% hydrogen peroxide solution. Collect all irrigation fluid for radiation monitoring.

5. More than one irrigation is usually necessary. Monitor for radiation levels after each irrigation.

6. Continue process until no change is seen in radiation levels.

7. After medical treatment is completed, cover wound with waterproof covering to prevent further spread of contamination.

8. If radiation levels are still dangerously high, surgical decontamination may be indicated (surgical debridement.)

C. DECONTAMINATION OF BODY ORIFICES

1. Contaminated body orifices, such as the mouth, nose, eyes, and ears, need special attention because absorption of radioactive material is likely to be much more rapid in these areas than through the skin.

2. If radiation is detected in oral cavity, have patient brush teeth with toothpaste, and rinse mouth with 3% citric acid solution.

3. Contaminated pharyngeal region may be treated by gargling with 3% hydrogen peroxide solution.

4. If radiation has been swallowed, gastric lavage may be indicated.

5. Nose may be rinsed out with normal saline or tap water.

6. Eyes should be flushed generously with normal saline, from inner to outer aspect.

7. Ears should be irrigated using ear syringe, if tympanic membrane is intact.

8. Reserve all irrigants for radiation detection, and continue irrigating until readings no longer improve.

D. DECONTAMINATION OF INTACT SKIN

1. Begin with the least aggressive method, and progress to more aggressive methods as needed.

2. Limit mechanical and chemical abrasion to the skin as much as possible.

3. Use warm solutions. Cold solutions will close the pores and trap radioactive material within them. Hot solutions increases blood flow and would enhance absorption of radioactive material.

4. Use warm water and surgical brush first. Scrub for 3 to 4 minutes. Rinse for 2 to 3 minutes. Dry. Check for radiation levels. Repeat.

5. Ph neutral soap, sodium hypochlorite (diluted 1/10 in water), powdered detergent mixed with cornmeal and made into a paste by adding water, or more aggressive measures (see Farley Emergency Plan Training page 20) may be tried.

6. The decontamination process stops when the radioactive level cannot be reduced to a lower level.

E. DECONTAMINATION OF INTACT SKIN IN HAIRY AREAS

1. Wrap or position patient to avoid spread of contamination.

2. Wash with Phisohex

3. Dry with an uncontaminated towel

4. Do not shave hair (unless area is contaminated with an alpha-emitter, such as plutonium, then only as a last resort.) Hair may be cut, but do not injure skin.

F. **TREATMENT OF PATIENT WITH INTERNAL CONTAMINATION**

1. See Farley Emergency Plan Training page 22, for specific agents used to decorporate various radionuclides.

2. Time may be a vital element in treatment of patients with internal contamination, since radioactive materials cross cell membranes at different rates.

3. The physician or Radiation Safety Officer shall request samples of urine, feces, vomitus, or wound secretions, as well as whole body assays, if internal contamination is suspected.

RADIATION ACCIDENT PLAN
Section 9.7
EQUIPMENT AND SUPPLIES
location--morgue area

DESCRIPTION	QUANTITY
Applicators, cotton tip, pkg.	1
Bags, Plastic	20
Basin	1
Blankets	6
Brushes, hand	2
Charger, Dosimeter	1
BatteSw Compartment operational	
Clippers, Hair	1
Containers, specimen	10
Cotton Balls, box	1
Decontaminating solution, bottle	1
Detergent soap, box	1
Dosimeter, Pocket (5R)	5
Drums, waste	3
Filter paper, box	2
IV Poles	2
Knifeblades #11 and #15	2
Labels, self sticking "RADIOACTIVE" roll	1
Lead container "pig"	1
Mask, surgeons, face	4
Needles, pkg	1
Paper, absorbent, roll	1
Poly sheets, roll	1
Protective clothing:	
Lab Coats	6
Rubber gloves, pr	20
Surgeons gloves, pr	8
Plastic shoe covers, pr	20
Surgeons Cap	4
Surgeons gown	4
Plastic surgical drape with adhesive	1
Record Materials	
Clipboard, paper, pencil	3
Logbook	1
Pen, with waterproof ink	1
Survey forms, 1 set	1
Rope, Radiation 100	1
Scissors, Metzenbalm, small	1
Scissors, sewing	1
Signs, Radiation	10
Specimen bottle, sterile	1
Specimen bottle	1
Suits, surgical	10
Survey Meter, G.M.	1
Pancake probe	1

EQUIPMENT AND SUPPLIES
location--morgue area

DESCRIPTION	QUANTITY
Medical probe	1
Calibration O.K.	1
Survey instrument--Ion chamber	1
Calibration O.K.	1
Suture--4 Ethicon	1
Suture set	1
Syringe bulb	1
Tags	10
Tape, masking, roll	2
TLDs	20
Calibration O.K.	1
Murphy Kelly forceps, curved 5 1/2	3
Murphy Kelly forceps, straight 5 1/2	2
Dressing forceps, no teeth	1
Adron forceps, with mouse teeth	1
Adron forceps, without teeth	1
Needle holder 5"	1
Needle holder 6"	1
Mosquito forceps, straight	3
Towel clips, Backhaus	2
Allis forceps (4x5) 5 1/2	1
Operating scissors S&B 5 1/2	1
#3 Knife Handle	1
Butcher Tray 19x12 1/2x 5/8"	1
Medicine cup	1
Syringe 2cc	1
Syringe 10cc	1
Hyponeedle, reusable 22G	1
Hyponeedle, reusable 25G	1
Red bags	4
Step-off pads	2
Herculite	1
Tyveks coveralls (white) case	2
Bandage scissors	2
Utility scissors	1
BP Cuff	3
Stethoscope	3
Oral thermometer box	1
Pen light	4
Sample bucket	1
Sample bottle	4
Xylocaine 2% with Epinephrine, bottle	1

FORM

1. Nature of INCIDENT: ______________________________

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2. Number of Casualties: ______________________________

3. Extent of Injuries: ______________________________

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4. Level of Radioactivity : ______________________________

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5. Personnel Involved: ______________________________

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6. Routing System Utilized: ______________________________

7. Procedural Errors: ______________________________

8. Communications: ______________________________

9. Involvement of Outside Agencies: ______________________________

10. Additional Comments: ______________________________

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RECOMMENDATIONS: ______________________________

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SIGNED: ____________________ DATE: ____________________
Drill Monitor

SIGNED: ____________________ DATE: ____________________
Director, Quality Review

RADIATION ACCIDENT DRILL
PARTICIPANT LOG
Section 9.8 (cont'd)

EMPLOYEE	DEPARTMENT
1.	
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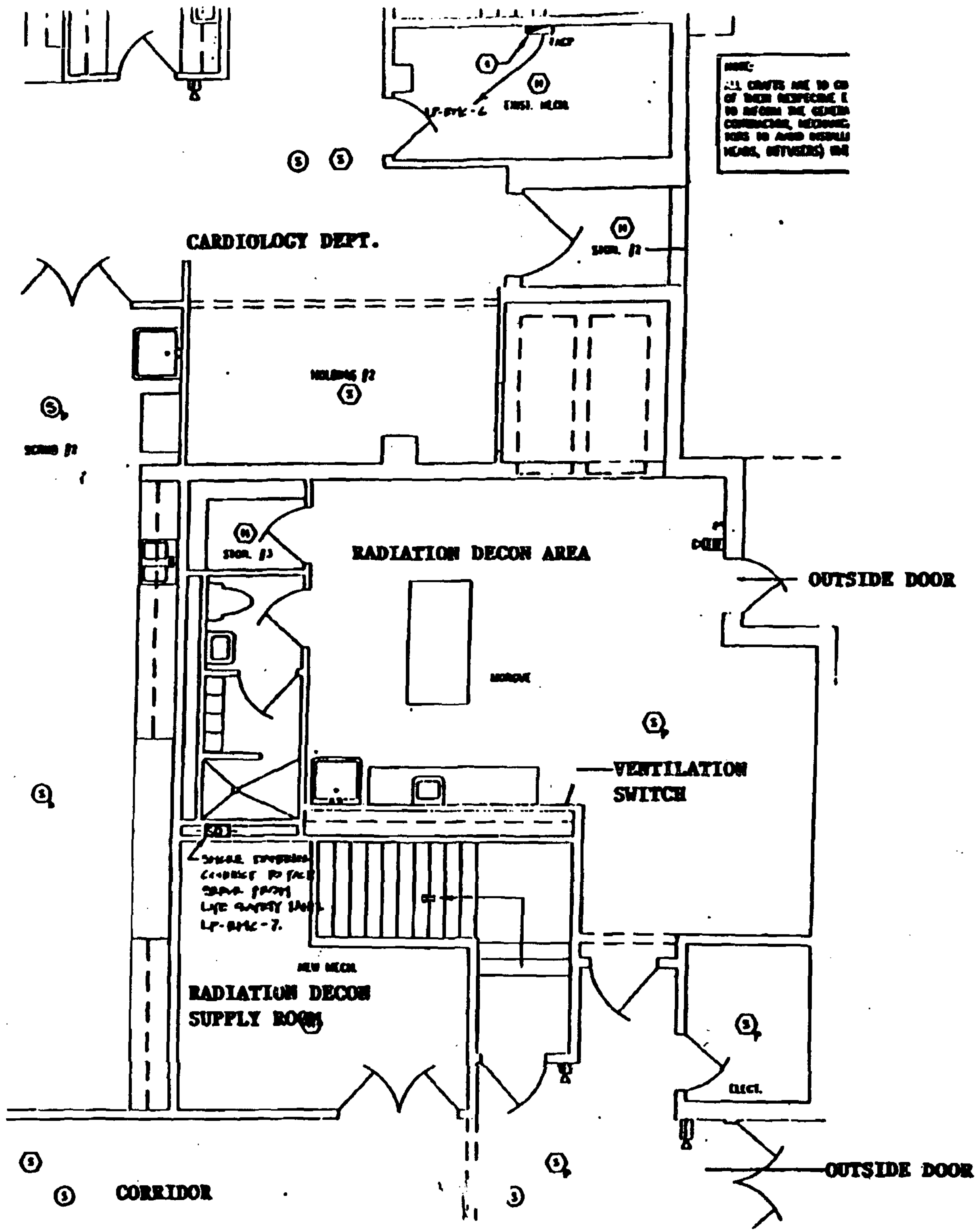
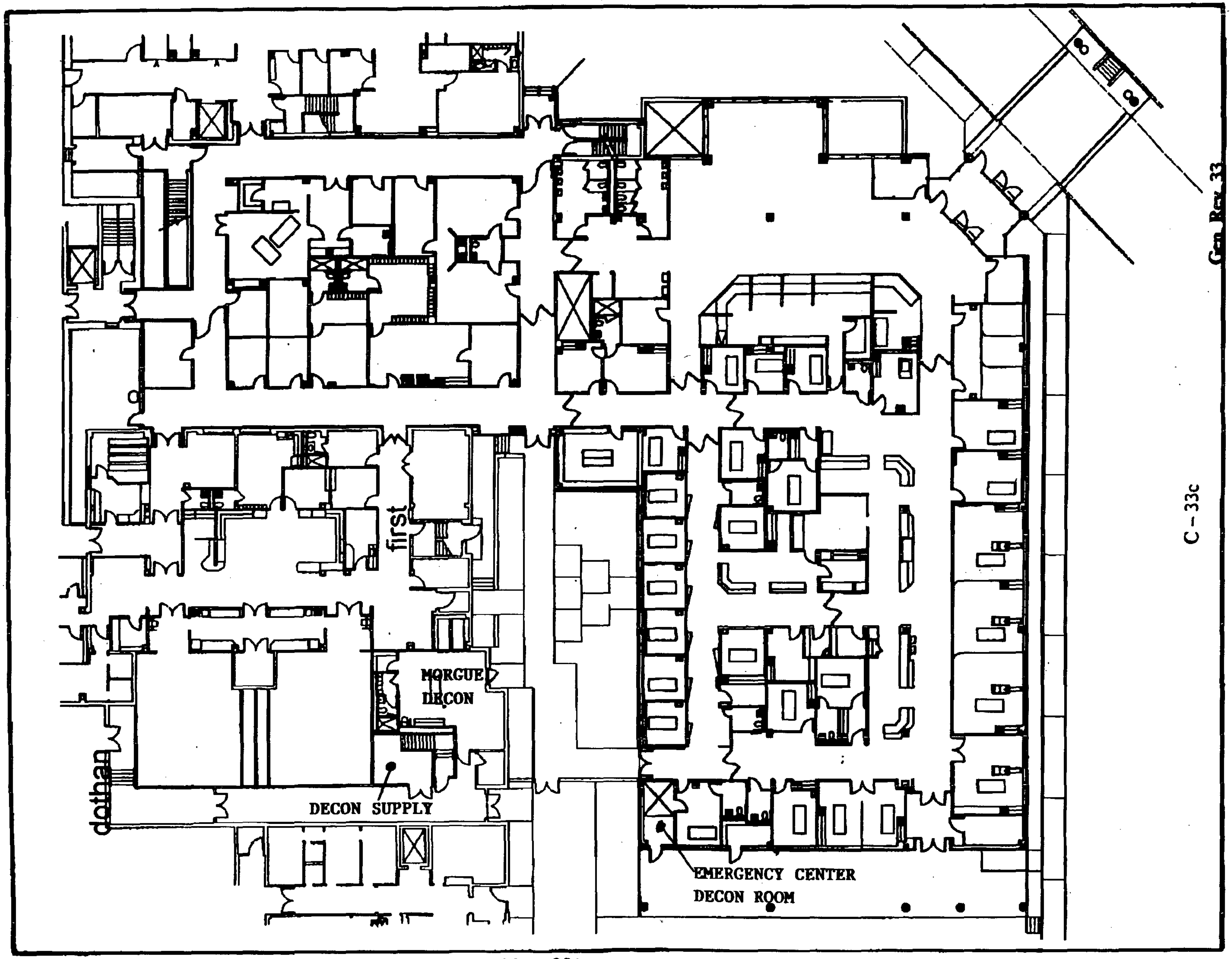
BADGE NUMBER			NAME/TITLE SOCIAL SECURITY #	DOSIMETER READING		TOTAL
TLD	RING	DOSIM.		IN	OUT	

Page 31


CARDIOLOGY DEPT.
RADIATION DECON AREA
OUTSIDE DOOR
MORGUE
VENTILATION
SWITCH
RADIATION DECON
SUPPLY ROOM
ELECT.
CORRIDOR
OUTSIDE DOOR


Gen Rev 33
MORGUE
DECON
first
dothan
DECON SUPPLY
EMERGENCY CENTER
DECON ROOM
C – 33c

RADIOLOGICAL EMERGENCY ASSISTANCE

TELEPHONE DIRECTORY

USE FOR ACCIDENTS INVOLVING RADIOACTIVE MATERIAL INCLUDING VEHICLES OR PACKAGES MARKED "RADIOACTIVE" OR "CAUTION RADIOACTIVE"

In the event of a Radiation Emergency during normal office hours (weekdays 8:00 am - 5:00 pm) please call 334-206-5391
or 1-800-582-1866 (8am-5pm)

FAX 334-206-5387

At all other times (after business hours, weekends, holidays) please contact one of the following:

Kirksey W. Whatley 334-288-7207

James L. McNees 334-277-1380

Mike Cash. 334-277-0750

William Eden 334-286-9548

If the above are unavailable, call 334-242-4378
and ask operator to page 971.

ALABAMA STATE BOARD OF HEALTH

RADIATION CONTROL DIVISION MONTGOMERY, ALABAMA

Revised 05/97

ALABAMA POWER COMPANY

FARLEY NUCLEAR PLANT

EMERGENCY PLAN TRAINING

Southeast Alabama Medical Center

HO1A1

Prepared by
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HOSPITAL EMERGENCY DEPARTMENT MANAGEMENT OF RADIATION ACCIDENTS

Robert C. Ricks, Ph.D.

Introduction

This book covers the basic principles of medical and nursing care for radiation accident victims in the hospital emergency department. Procedures described in the text apply to the management of peacetime radiation accidents in industry, research, transportation, and hospitals. Although the use of radiation and radioactive materials has increased in recent years, history has shown that the probability of providing emergency medical and nursing care to a radiation accident victim patient is very low. Nevertheless, federal, state, and local agencies, as well as medical accrediting groups, have encouraged better overall preparedness for radiological emergencies. Written emergency response plans should be developed, incorporated with your overall hospital disaster plan, and supported with inservice training and drills.

This book will suggest ways of adapting your emergency response plans for radiation accident management. Emphasis is placed on caring for the patient contaminated with radioactive material, including organization of the radiological emergency response team, facility and staff preparation, patient reception and triage, medical and decontamination procedures, contamination control, radiological monitoring, bioassay sampling, patient transfer, and postemergency activities. The importance of health physics support and sources of assistance are also covered. Basic information about radiation, radiobiology, radiological monitoring equipment, and principles of radiation protection are discussed.

This book is designed to complement a 25-minute videotape entitled "Hospital Emergency Department Response to Radiation Accidents," which depicts a case study of emergency department response to both injured and uninjured contaminated patients. Either the text or the videotape can, however, be used independently.

Types of Radiation Injury

Regardless of where or how an accident involving radiation happens, *three types of radiation-induced injury can occur: external irradiation, contamination with radioactive materials, and incorporation of radioactive material into body cells, tissues, or organs.*

External Irradiation

External irradiation occurs when all or part of the body is exposed to penetrating radiation from an external source. During exposure this radiation can be absorbed by the body or it can pass completely through. A similar thing occurs during an ordinary chest x-ray. Following external exposure, an individual is not radioactive and can be treated like any other patient.

Contamination

The second type of radiation injury involves *contamination* with radioactive materials. Contamination means that radioactive materials in the form of gases, liquids, or solids are released into the environment and contaminate people externally, internally, or both. An external surface of the body, such as the skin, can become contaminated, and if radioactive materials get inside the body through the lungs, gut, or wounds, the contaminant can become deposited internally.

Incorporation

The third type of radiation injury that can occur is *incorporation* of radioactive material. Incorporation refers to the uptake of radioactive materials by body cells, tissues, and target organs such as bone, liver, thyroid, or kidney. In general, radioactive materials are distributed throughout the body based upon their chemical properties. Incorporation cannot occur unless contamination has occurred.

These three types of accidents can happen in combination and can be complicated by physical injury or illness. Table 1 summarizes the types of radiation injuries.

Table 1. Types of Radiation Injury.

1. *External irradiation*—whole-body or partial-body
2. *Contamination by radioactive materials*—external (deposited on the skin) or internal (inhaled, swallowed, absorbed through skin, or introduced through wounds)
3. *Incorporation of radioactive materials*—uptake by body cells, tissues, or organs (bone, liver, kidney, etc.)
4. *Combined radiation injury*—combination of the above which may be complicated by trauma

Irradiation of the whole body or some specific body part does not constitute a medical emergency even if the amount of radiation received is high. The effects of irradiation usually are not evident for days to weeks and while medical treatment is needed, it is not needed on an emergency basis. On the other hand, contamination accidents must be considered medical emergencies since they *might* lead to internal contamination and subsequent incorporation. Incorporation can result in adverse health effects several years later if the amount of incorporated radioactive material is high.

Hospital emergency department personnel should always use proper priorities in caring for accident victims where potential radiation hazards exist: treat life-threatening problems first, limit the radiation dose to both victim and personnel, and control the spread of radioactive contaminants. *Serious medical problems always have priority over concerns about radiation, such as radiation monitoring, contamination control, and decontamination.*

4.

Background Radiation and Radiobiology

Background Radiation

Radioactivity has existed for millions of years in the crust of the earth, in building materials, in the food we eat, the air we breathe, and in virtually everything that surrounds us. Radiation from these materials, as well as cosmic radiation from the sun and universe, makes up the natural background radiation to which we are constantly exposed. The average individual in the United States receives a radiation dose of approximately 85 millirem per year from natural sources. Because natural background radiation varies with altitude, it is lower than average at sea level, but higher than average at high altitudes.

The average annual radiation dose from man-made sources is about 103 millirem, with medical x-rays and nuclear medical diagnostic tests contributing the largest amounts (approximately 79 millirem and 14 millirem respectively). Therefore, in the United States, the typical annual individual exposure to radiation from natural and man-made sources totals approximately 188 millirem. Table 2 summarizes typical background radiation levels in the United States.

A few regions around the world have background radiation that is quite high (up to 2,500 millirem per year). Especially notable areas include the Kerala region of India and the states of Espirito Santo and Rio de Janeiro in Brazil. Human populations in these regions have been studied for specific diseases that might be associated with high background radiation levels; however, no statistical evidence has been found to correlate increased background radiation with any specific disease. Studies in the United States also have resulted in similar findings.

Occupational exposure to ionizing radiation is limited to 5,000 millirem per year for persons who work with radioactive materials or radiation-generating devices and who wear dosimeters. For those persons who do not wear dosimeters, safety precautions direct that exposure be limited to 500 millirem per year.

Table 2. Typical Average Annual Exposures to Individuals from Background Radiation in the United States.

	Radiation Dose in Millirems (prorated over total population)
Natural Sources	
External	
From cosmic radiation	28
From the earth	26
From building materials	3
Internal Sources (elements found naturally in human tissues)	28
Total, Natural Sources	85
Man-made Sources	
Medical Procedures	
Diagnostic x-rays	79
Radiopharmaceuticals	14
Nuclear industry	<1
Consumer products	3–4
Radioactive fallout	4–5
Total, Man-made Sources	103
Total, Natural and Man-made Sources	188

Data from *The Effects on Populations of Exposure to Low Levels of Ionizing Radiation*, typescript edition (Washington, D.C.: National Academy of Sciences, 1980), table II-23.

Radiobiology

Signs and symptoms associated with radiation exposure or contamination vary depending upon the total dose and the dose rate to the body. Also, the effects of ionizing radiation on biological systems can be manifested as both early and late effects. In general, the higher the dose the greater the severity of early effects and the greater the possibility of late effects.

Exposure of the whole body to a dose greater than 100 rem results in a predictable set of signs and symptoms that develop within a few hours, days, or up to 4 weeks later, depending on the dose. These signs and symptoms are collectively called the *acute radiation syndrome*, which is characterized by four distinct phases: a prodromal period, a latent period, a period of illness, and one of recovery or death. During the prodromal period patients might experience loss of appetite, nausea, vomiting, fatigue, and diarrhea; after extremely high doses, additional symptoms such as fever, prostration, respiratory distress, and hyperexcitability can occur. However, all of these symptoms usually disappear in a day or two, and a symptom-free, latent period follows, varying in length depending upon the size of the radiation dose.

A period of overt illness follows, and can be characterized by infection, electrolyte imbalance, diarrhea, bleeding, cardiovascular collapse, and sometimes short periods of unconsciousness. Death or a period of recovery follows the period of overt illness. Patients suffering from the acute radiation syndrome are generally admitted to the emergency department during the prodromal period. No emergency medical treatment is required for this patient, and the patient is not radioactive. Initial treatment is directed to prodromal signs and symptoms, and a good history is taken. The definitive treatment of the acute radiation syndrome is beyond the scope of this book.

Exposure of some limited area of the body (hands, feet, etc.) to ionizing radiation also results in a predictable clinical course that unfolds over a 2 to 8 week period. For example, epilation can occur in 2 to 3 weeks following 300 rem, erythema in 1 to 3 weeks following 600 rem, dry desquamation in 2 to 3 weeks following 1,200 to 1,500 rem, and blistering or wet desquamation in 3 to 5 weeks following doses greater than 2,500 rem. Radionecrosis can occur following a 5,000 rem or larger dose. Extremely high doses (greater than 10,000 rem) of ionizing radiation to localized areas of the body will accelerate the expression of injury associated with the radiation insult. Like the person suffering from the acute radiation syndrome, the individual experiencing localized radiation problems is not radioactive and does not require any emergency medical intervention. Physical trauma to the irradiated area should be avoided.

Following external contamination, overt signs or symptoms are rarely seen in patients entering the hospital emergency department. However, externally deposited radionuclides should be removed as soon as possible. Internal contamination with radioactive materials can result in biological damage. The severity of the damage depends on the amount of radionuclide deposited, its chemical form, the target organ, and the rate of elimination from the body. Each radionuclide has an administratively determined maximum safe intake limit, based on the types of radiations emitted and their energies. This limit is defined as the *maximum permissible body burden* (MPBB) or *maximum permissible organ burden* (MPOB). Exact levels of internally deposited radioactive materials are difficult to assess, especially in the emergency medical setting. The important point is that every effort should be made to decontaminate accident victims as thoroughly as possible whether they are externally or internally contaminated.

3.

Radiation Protection Principles

There are four basic radiation protection principles that can be employed to reduce exposure to ionizing radiation. These principles are based on consideration of *four radiation protection factors* that alter radiation dose: time, distance, shielding, and quantity.

Time

Time is an important factor in radiation protection. This principle states that the shorter the time spent in a radiation field, the less radiation will be accumulated. Depending on the activity present, radioactive material will emit a known amount of radiation per unit time. Many radiation monitoring devices measure exposure in milliroentgens (mR) per hour. An exposure rate of 60 mR/hr means that for each minute spent in a radiation field, a person will receive a 1-mR exposure (60 mR/hr ÷ 60 min/hr = 1 mR/min). Obviously, the longer a person remains in a radiation field, the more radiation that person will accumulate.

A *rotating team approach* can be used to keep individual radiation exposures to a minimum as long as patient care is not compromised and if personnel are available.

Distance

The second radiation protection factor is *distance*, and the principle is the farther a person is from a source of radiation, the lower the radiation dose. This principle is known as the inverse square law. By measuring the radiation exposure rate at a given distance from a source of radiation and then doubling the distance from the source, the intensity of the radiation is decreased by a factor of four. For example, a source of radiation that measures 8 mR/hr at 2 feet from a source would measure only 2 mR/hr at 4 feet. Conversely, when the distance from the source of radiation is reduced by half, for example, from 2 feet to 1 foot, the exposure rate increases from 8 mR/hr to 32 mR/hr, a factor of four. Figure 1 illustrates the inverse square law.

Shielding

The third radiation protection factor is *shielding*. The principle follows that the denser a material, the greater is its ability to stop the passage of radiation. In most cases, high-density materials such as lead are used as shields against radiation. Portable lead or concrete shields are sometimes used when responding to accidents where contamination levels are very high. In addition, some specialty centers for radiation accident management have constructed shielded surgical tables for protection. Such measures are, however, not recommended in the community hospital.

In emergency management of the contaminated patient, shielding is limited to standard surgical clothing with slight modifications (see page 12). Surgical clothing will protect the individual against contamination, and also will stop the passage of all alpha and some beta radiation. However, it does not stop penetrating gamma radiation. In the hospital emergency department shielding is actually limited to anticontamination measures, and the principles of time and distance are used to reduce radiation exposure.

Quantity

The fourth radiation protection factor is *quantity*. Because the exposure rate from a given radioactive material is directly related to the amount or quantity of the material present, the principle involves limiting the quantity of radioactive material in the working area to decrease radiation exposure. Any technique that reduces the amount of radiation or radioactive material in the treatment area is very useful.

By using these radiation protection principles, emergency department personnel can adequately care for the patient's medical needs while keeping their own radiation exposure as low as reasonably achievable. This concept is known as *ALARA* and is summarized below:

ALARA Techniques: (keeping radiation exposures *A*s *L*ow *A*s *R*easonably *A*chievable)

1. *Work quickly and efficiently* (TIME)
2. *Rotate personnel if qualified replacements are available* (TIME)
3. *When not involved in patient care, remain a few feet away from the patient* (DISTANCE)
4. *Use long-handled forceps to remove contaminated particles, contaminated dressings, etc.* (DISTANCE)
5. *Remove contaminated materials from treatment area* (QUANTITY, DISTANCE)
6. *Put contaminated metal or glass in lead "pigs" obtained from nuclear medicine department* (SHIELDING)

4.

Preparing to Receive the Radiation Accident Victim

Notification and Accident Verification

When the hospital receives a call that a radiation accident victim is to be admitted, a planned course of action should be followed. The individual receiving the call should get as much information as possible, including the following:

1. Number of accident victims
2. Each victim's medical status
3. If victims have been surveyed for contamination
4. Radiological status of victims (exposed vs. contaminated)
5. Identity of contaminant, if known
6. Estimated time of arrival

If any doubt about contamination exists, assume the victim is contaminated until proven otherwise. Advise ambulance personnel of any special entrance to the emergency department for the radiation accident victim. If the accident notification comes from a source other than usual emergency communications, get a call-back number and verify the accident prior to assembling the radiological emergency response team and preparing for patient admission.

The Radiological Emergency Response Team

Each member of this team should be familiar with the hospital's written plan and be required to participate in scheduled drills. More frequent drills (quarterly or semiannually) should be considered by subgroups such as decontamination, triage, or radiological monitoring. Special training must be instituted to accommodate staff turnover. Training should also be part of the hospital inservice program and should include EMTs and paramedics since they play an important role in assisting the emergency department staff through notification procedures before arrival and proper transport of radiation accident victims. Table 3 lists members of the radiological response team.

Preparation of the Radiation Emergency Area (REA)

Following verification of a radiation accident involving contamination, the radiological emergency response team should prepare for patient reception. Special preparation techniques are designed to protect the attending staff, hospital facility, and equipment while preventing the spread of contamination outside a designated decontamination area. Procedures used in the handling of contaminated accident victims are similar to strict isolation precautions and to the protocol for "dirty" surgical cases.

When radioactive contamination is suspected, strict isolation precautions are supplemented with contamination control techniques. This will prevent the spread of contaminants to the hospital environment and simplify cleanup.

Any victim of a radiation accident must be considered contaminated until proven otherwise. Consequently, assume that the route taken from the ambulance to the radiation emergency area (REA) can become contaminated. Patients, uncontaminated victims, and nonessential personnel should be removed from the area before use.

A specific area in the REA should be designated for patient decontamination. It should be large enough to hold one or more victims and the necessary medical personnel. Ventilation in the REA can be turned off by the hospital engineering department. Also, return air ducts can be closed or covered with filters. Although airborne contamination is unlikely, its removal from the air-conditioning system would be difficult.

Rolls of brown wrapping paper or butcher paper 3- to 4-feet wide can be unrolled to make a path from the ambulance entrance to the decontamination room. Ordinary cloth sheets or square absorbent pads can be used if paper is unavailable. Whatever the floor covering, *it should be taped*

Table 3. Radiological Emergency Response Team.

Personnel	*Function*
Team coordinator	Leads, advises, and coordinates
Emergency physician	Diagnoses, treats, and provides emergency medical care; can also function as team coordinator or triage officer
Triage officer	Performs triage
Nurse	Assists physician with medical procedures, collection of specimens, radiological monitoring, and decontamination; assesses patient's needs and intervenes appropriately
Technical recorder	Records and documents medical and radiological data
Radiation safety officer	Monitors patient and area and advises on contamination and exposure control; maintains survey equipment
Public information officer	Releases accident information to public media
Administrator	Coordinates hospital response and assures normal hospital operations
Security personnel	Secure the radiation emergency area and control crowds
Maintenance personnel	Aid in preparation of the radiation emergency area for contamination control
Laboratory technician	Provides routine clinical analysis of biological samples

securely to the floor. This route should then be roped off and marked "radiation area." The floor of the decontamination room or treatment area should be covered in a similar way.

A control line should be established at the entrance to the decontamination room. A wide strip of tape on the floor at the entrance to the room should be marked clearly to differentiate the controlled (contaminated) from the noncontrolled (uncontaminated) side. Once the patient is in the decontamination room, no person or equipment should leave the decontamination area until monitored at this control point for contamination. Techniques for contamination control are summarized in Table 4. Proper taping of floor covering and establishment of a control line are illustrated in Figure 2.

Once all nonessential equipment in the room is removed or covered, door handles and light switches can be covered by taping plastic sandwich bags over them to reduce contamination that might be spread by hand. *Life support and other essential medical equipment and supplies should be available immediately and ready for use.*

A decontamination table can be prepared in a variety of ways. For example, a standard treatment table can be draped with a waterproof covering—a disposable surgical pack cover from the operating room is ideal. A burn table or specially designed decontamination tray also can be used. If desired, sheets can be rolled lengthwise and placed along the edges of a treatment table, then covered with plastic sheeting formed into a trough for fluid drainage.

A complete listing of the items needed to prepare the emergency department is given in Table 5.

Response Team Preparation

While the facility is being prepared, members of the radiological emergency response teams should

Table 4. Techniques of Contamination Control.

1. Set up a controlled area large enough to hold the anticipated number of victims
2. Prevent tracking of contaminants by covering floor areas
3. Restrict access to the controlled area
4. Monitor **anyone** or **anything** leaving the controlled area
5. Use strict isolation precautions, including protective clothing and double bagging
6. Use a buffer zone or secondary control line for added security
7. Control waste by using large, plastic-lined containers for clothing, linens, dressings, etc.
8. Control ventilation
9. Change instruments, outer gloves, drapes, etc. when they become contaminated
10. Use waterproof materials to limit the spread of contaminated liquids; for example, waterproof aperture drapes

be dressing in surgical clothi[illegible] gown, mask, cap, and gloves). Waterproof shoe covers also should be used. All open seams and cuffs should be taped using masking or adhesive tape. Foldover tabs at the end of each taped area will aid removal. Two pairs of surgical gloves should be worn. The first pair of gloves should be under the arm cuff and secured by tape. The second pair of gloves should be easily removable and replaced if they become contaminated. A radiation dosimeter should be assigned to each team member and attached to the outside of the surgical gown at the neck where it can be easily removed and read. If available, a film badge can be worn under the surgical gown. A waterproof apron can also be worn by any member of the team using liquids for decontamination purposes. Proper attire is shown in Figure 3.

This protective clothing is effective in stopping alpha and some beta particles but not gamma rays. Lead aprons, such as those used in the x-ray department, are not recommended since they give a false sense of security—they will not stop most gamma rays.

Preparation for Radiological Monitoring

Prior to patient arrival, check radiation moni-

Figure 2. Proper Taping of Floor Covering and Establishment of a Control Line.

1. Proper taping of seams or edges of floor covering using masking tape or equivalent
2. Rope barrier establishing controlled area 3. Taping floor to establish control line

I. Emergency Department Preparation

A. Rolls of 3- to 4-foot wide brown wrapping paper (butcher paper) or square absorbent padding sufficient to cover the floor from the ambulance entrance to the decontamination room, as well as cover the entire floor of the decontamination room

B. Rolls of 2-inch wide masking tape to secure the floor covering, tape decontamination team's sleeves and cuffs, cover handles in the decontamination room, and make a "control line" at door to decontamination room

C. Rope to delineate route from ambulance entrance to decontamination room

D. *"Caution—Radiation Area"* signs to place on rope and on door to decontamination room

II. Decontamination Room

A. Decontamination table with waterproof cover, burn table, or other specially designed table

B. Three 5-gallon containers for wash water

C. Three large waste containers lined with plastic bags

D. Various sizes of plastic bags for samples, clothes, etc.

E. Cotton-tipped applicators

F. Stoppered containers for swabs of contaminated areas

G. Small lead storage containers (pigs) for holding radioactive foreign bodies removed from wounds—obtain from Nuclear Medicine Department

H. Chart with drawing of patient outline, front and back, for recording contaminated areas

I. Solutions or materials for decontamination:

1. Sterile saline

2. Sterile water

3. Sodium hypochlorite or household bleach

4. Povidone iodine solution or other surgical soap

5. Abrasive soap

6. Soft scrub brushes

7. Mixture of one-half powdered detergent and one-half cornmeal, kept airtight or refrigerated

8. 3-percent hydrogen peroxide solution

9. Shampoo

J. All necessary emergency medical supplies and equipment (suction, oxygen, airways, intubation, IV solutions, etc.)

K. Sheets, blankets, towels, and patient gowns

III. Decontamination Team

A. Scrub suits

B. Gowns

C. Surgical hoods

D. Masks

E. Surgical gloves of various sizes

F. Waterproof shoe covers

G. Film badges

H. Dosimeters

I. Rubber or plastic aprons (lightweight, not lead-lined, x-ray type)

J. Masking tape or equivalent

IV. Radiation Safety Officer

A. G-M survey meters

B. Ionization chamber

C. Alpha detector (optional)

D. Extra batteries for survey meters

E. "Radioactive" labels or stickers to mark containers holding contaminated specimens or swabs

F. Wax or felt pens to mark labels

Figure 3. Proper Dress-out.

1. Radiological emergency response team members dressed-out in waterproof gowns and other standard surgical attire.
2. Cuffs and inner gloves are taped for contamination control purposes. Note tabs on tape for quick removal.

tors as described on page 29. Cover the probe with a surgical glove and secure with tape, making a tab for easy removal, and check to ensure that no glove fingers are dangling. This will protect the probe in the event that it touches a contaminated area. A contaminated surgical glove can easily be removed and replaced while a contaminated probe cannot. Finally, *check and record the background radiation level* in the decontamination room (see procedure on page 30). The background measurement will serve as a reference point in assessing levels of contamination. The radiological emergency response team is now ready to receive the accident victims.

If Radioactive Contamination Is Discovered After Patient Has Been Admitted

1. *Continue attending to the patient's medical needs*
2. *Secure entire area where victim and attending staff have been*
3. *Do not allow anyone or anything to leave area until cleared by the radiation safety officer*
4. *Establish control lines, and prevent the spread of contamination*
5. *Completely assess patient's radiological status*
6. *Personnel should remove contaminated clothing before exiting area; they should be surveyed, shower, dress in clean clothing, and be resurveyed before leaving area*

5.

Hospital Emergency Care of the Radiation Accident Patient

Patient Arrival and Triage

* Meet the radiation accident victim at the ambulance or other transporting vehicle. Instruct ambulance personnel to stay with the vehicle until they and their vehicle are surveyed and released by a radiation safety officer.

Immediate assessment of the victim's airway, breathing, and circulation should be made and any necessary lifesaving measures performed. The critically injured patient should be taken immediately into the prepared emergency area. If the victim's condition allows, an initial, *brief* radiological survey can be performed to determine if the victim is contaminated. Any radiation survey meter reading above background radiation levels indicates the possibility of contamination. A more thorough survey will be performed in the decontamination room (see page 18). If the victim's contaminated clothing has not been removed, remove it in or near the ambulance and place it in a plastic bag. Personal belongings and items used in patient care should be bagged, labeled, and saved for examination by the radiation safety officer.

A triage area should be established near the treatment area. During triage, consideration is given to medical and radiological problems. *Serious medical problems always have priority over radiological concerns*, and immediate attention is directed to life-threatening problems. Radiation injury rarely causes unconsciousness or immediate visible signs of injury and is not immediately life-threatening; therefore, other causes of injury or illness *must* be considered. Noncontaminated patients are admitted to the usual treatment area, while contaminated patients *must* be admitted to the specially prepared area.

Assessment and Treatment of the Noncontaminated Patient

Noncontaminated individuals can be cared for like any other emergency case. Following attention to medical needs, question the patient to determine the possibility of radiation exposure from an external source. Remember, the victim of exposure without contamination poses no radiological hazard to anyone. If exposure is known or suspected, a stat CBC should be ordered with particular attention given to determining the absolute lymphocyte count. Be sure to record the time the blood sample is taken.

Assessment and Treatment of the Contaminated Patient

Contaminated patients can have radioactive materials deposited on skin surfaces, in wounds, or internally (ingested, inhaled, or absorbed). Reassessment of the contaminated patient's airway, breathing, and circulation are done in the decontamination room prior to attention to the patient's radiological status. It is unlikely that cardiopulmonary resuscitation (CPR) will be required on a victim whose only problem is inhalation or ingestion of radioactive materials. However, the emergency physician or nurse might be concerned with becoming contaminated (lips, mouth, lungs, or gut) when performing mouth-to-mouth resuscitation. Since serious contamination is unlikely, mouth-to-mouth breathing should not be withheld if a bag-mask, ambu-bag, or positive pressure ventilator is not available to support breathing.

As in other cases of emergency medical care, many procedures are accomplished simultaneously when time is at a premium. Level of consciousness and vital signs are assessed promptly and the patient's condition is stabilized. After examining the entire patient and identifying all injuries, a complete radiological survey should be done. The procedure for this survey is shown in Table 6.

The patient should be questioned about allergies, currently used medications, any history of chronic or recent illness, and *recent nuclear medicine tests*. The patient's level of anxiety should be

Table 6. How To Survey a Patient for Contamination.

A patient survey can be done simultaneously with other emergency procedures, provided there is no interference with needed emergency care.

1. **Use a low-range survey meter, such as a CD V-700.**
2. **Before entering the decontamination room or before patient arrival, perform operational check of instrument and determine background level (see page 30); open the shield on the probe; and cover the probe with a small plastic bag or plastic glove.**
3. **Set instrument selector switch to the x1 range (CD V-700) or most sensitive scale of the instrument.**
4. **When necessary, adjust the range of the instrument by moving the selector switch. *Meter readings should not be taken when the dial indicator reads in the lower 10 percent of the scale when on the x 100 and x 10 ranges. Turn the selector switch to the next most sensitive range to measure the exposure rate more accurately.***
5. **Holding the probe approximately 1 inch from the patient's skin, systematically survey the entire body from head to toe on all sides. Move the probe slowly (about 1 inch per second) and pay particular attention to wounds, orifices, body folds, hairy areas and hands.**
6. **An increase in count rate or exposure rate above background indicates the presence of radiation.**
7. **Document time and radiation measurements on an anatomical drawing; each subsequent survey result should be documented.**
8. **The use of headphones with the CD V-700 facilitates monitoring.**

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noted, and psychological support offered. A complete and detailed medical, occupational, and accident history should be taken, and a physical examination completed.

Certain clinical and radiological laboratory analyses are essential to the care of the radiation accident patient. These laboratory tests are done ... biological effects of radiation injury; to identify abnormalities that might complicate treatment; to locate, identify, and quantify radionuclide contamination; and to provide information useful in accident analysis. The biological and physical samples needed, why they are taken, and how they are handled are reviewed in Table 7.

Decontamination of the Contaminated Patient

Good judgment is essential in determining decontamination priorities. Since some radioactive materials are corrosive or toxic because of their chemical properties, medical attention might have to be directed first to a nonradiological problem if radioactive materials were shipped as acids, fluorides (uranium hexafluoride-UF_6), mercury, or lead compounds.

In general, contaminated wounds and body orifices are decontaminated first, followed by areas of highest contamination levels on the intact skin. The purpose of decontamination is to prevent or reduce incorporation of the material (internal contamination), to reduce the radiation dose from the contaminated site to the rest of the body, to contain the contamination, and to prevent its spread.

External Contamination

Decontamination of the intact skin is a relatively simple procedure. Complete decontamination, which returns the area to a background survey reading, is not always possible because some radioactive material can remain fixed on the skin surface. Decontamination should be only as thorough as practical.

Decontamination should begin with the least aggressive method and progress to more aggressive ones. Whatever the procedure, take care to limit mechanical or chemical irritation of the skin. The simplest procedure is to wash the contaminated area gently under a stream of water (do not splash) and scrub at the same time using a soft brush or surgical sponge. Warm, never hot, tap water is used. Cold water tends to close the pores, trapping radioactive material within them. Hot water causes vasodilation with increased area blood flow, opens the pores, and enhances the chance of absorption of the radioactive material through the skin. ***Aggressive rubbing tends to cause abrasion and erythema and should be avoided.***

Table 7. Radiological and Clinical Laboratory Assessments.

All samples must be placed in separate, labeled containers that specify name, date, time of sampling, area of samples, and size of area samples. Medical, legal, and other postaccident investigations require that no blood, urine, feces, or other samples taken in the emergency treatment period be disposed of without authorization.

SAMPLES NEEDED	WHY?	HOW?
In all cases of radiation injury:		
CBC and differential STAT (follow with absolute lymphocyte counts every 6 hours for 48 hours when history indicates possibility of total-body irradiation)	To assess the radiation dose; initial counts establish a baseline, subsequent counts reflect the degree of injury	Choose a noncontaminated area for veni-puncture; cover puncture site after collection
Routine urinalysis	To determine if kidneys are functioning normally and establish a baseline of urinary constituents; especially important if internal contamination is a possibility	Avoid contaminating specimen during collection; if necessary, give the patient plastic gloves to wear for collection of specimen; label specimen "Number 1," with date and time
When external contamination is suspected:		
Swabs from body orifices	To assess possibility of internal contamination	Use separate saline- or water-moistened swabs to wipe the inner aspect of each nostril, ear, mouth, etc.
Swabs from wounds	To determine if wounds are contaminated	Use moist or dry swabs to sample secretions from each wound or collect a few drops of secretion from each using a dropper syringe; for wounds with visible debris, use applicator or long tweezers or forceps to transfer samples to specimen containers which are placed in lead storage containers (pigs)
Skin wipes	To locate contaminated areas	Use filter paper, smear pads, or compresses to wipe sample areas 10cm × 10cm in size
When internal contamination is suspected:		
Urine: 24-hour specimen x 4 days	Body excreta may contain radionuclides if internal contamination has occurred	Use 24-hour urine collection container

continued

Table 7, continued

Feces x 4 days	Body excreta may contain radionuclides if internal contamination has occurred	Save excreta in plastic containers in refrigerator or freezer
Vomitus	Body excreta may contain radionuclides if internal contamination has occurred	Save excreta in plastic containers in refrigerator or freezer
Sputum	To assess respiratory tract contamination if inhalation of contaminant was a possibility	Use a 5-percent propylene-glycol aerosol to get a deep cough specimen
Serum creatinine	To assess kidney function if chelation is indicated	Clinical chemistry
Other samples needed:		
All irrigating fluids	Radiological assessment	Save in sealed and labeled, glass- or plastic-lined containers

If washing with plain water is ineffective, a mild soap (neutral pH) or surgical scrub soap can be used. The area should be scrubbed for 3 to 4 minutes, then rinsed for 2 to 3 minutes and dried, repeating if necessary. Between each scrub and rinse, check the contaminated area to see if radiation levels are decreasing. Sodium hypochlorite, diluted 1 to 10 with water, is an effective decontamination agent. A mildly abrasive soap; a 1 to 1 mixture of powdered detergent and cornmeal mixed with water into a paste; a paste of sawdust and water; or a mixture of 65 percent $NaPO_4$, 5 percent carboxylmethycellulose, and 30 percent detergent as a 5-percent solution in water can be used.

More aggressive measures for decontamination include procedures that remove cornified epithelium. Very fine sandpaper can be used on hands or feet. Potassium permanganate (4 percent) followed by sodium bisulfite (4 percent) also can be used with caution. ***The decontamination procedure stops when the radioactivity level cannot be reduced to a lower level.*** Expert advice might be needed to determine an appropriate stopping point. Contaminated hairy areas can be shampooed several times and then rinsed in a 3-percent citric acid solution. Contaminated hair can be clipped if shampooing is ineffective. Shaving should be avoided since small nicks or abrasions can lead to internal contamination. When shampooing the head, avoid getting any fluids into the ears, eyes, nose, or mouth.

The procedures described above also apply to the decontamination of uninjured accident victims. Decontamination of an uninjured patient can be accomplished on a treatment table if necessary. Small areas (hands, feet, etc.) can be decontaminated using a sink or basin. If extensive body areas are contaminated, the patient can be showered under the direction or with the assistance of a radiation safety officer. Caution the patient to avoid splashing water into the eyes, nose, mouth, or ears. Repeated showers might be necessary, and clean towels provided for drying after each shower. Again, decontamination should be as thorough as practical. Contaminated water can be released directly into the hospital sanitary drain system. Special storage or holding tanks are recommended.

Treatment of Contaminated Wounds

In a contamination accident, any wound must be considered contaminated until proven otherwise and ***should be decontaminated prior to decontaminating intact skin.*** When wounds are contaminated, the physician must assume that uptake (internal contamination) has occurred. Appropriate action is based on half-life, radiotoxicity, and the maximum permissible body burden of the radioactive material. It is important to consult experts as soon as possible and to initiate measures that prevent or minimize uptake of the radioactive material into body cells or tissues.

Contaminated wounds are first draped, preferably with a waterproof material, to limit the spread of radioactivity. Wound decontamination is accomplished by gently irrigating with saline, water, or a 3-percent hydrogen peroxide solution. Irrigation fluid should be collected and checked with a radiation monitor to judge the effectiveness of decontamination. More than one irrigation is usually necessary. The wound should be monitored after each irrigation. Contaminated drapes, dressings, etc. should be removed before each monitoring for accurate results. When monitoring contaminated wounds or irrigation fluids, gamma radiation is easily detected while beta radiation may prove more difficult to detect. Without special, highly sophisticated wound probes, alpha contamination will not be detected. Following irrigation, the wound is treated like any other wound. If the preceding decontamination procedures are not successful, apply a constriction band to increase blood flow and to help remove contamination from the wound. If this is unsuccessful and the contamination level is still seriously high, surgical decontamination, which is identical to conventional debridement of a wound, must be considered. Debridement should not be initiated until expert medical or health physics advice is obtained. Debrided or excised tissue should be retained for health physics assessment.

Embedded radioactive particles, if visible, can be removed with forceps or by using a water-pik. Puncture wounds containing radioactive particles, especially in the fingers, can be decontaminated by using an "en bloc" full thickness skin biopsy using a punch biopsy instrument.

After the wound has been decontaminated, it should be covered with a waterproof dressing. The area around the wound is decontaminated as thoroughly as possible before suturing or other treatment.

Contaminated burns (chemical, thermal) are treated like any other burn. Contaminants will slough off with the burn eschar. However, dressings and bed linens can become contaminated and should be handled appropriately.

Decontamination of Body Orifices

Contaminated body orifices, such as the mouth, nose, eyes, and ears, need special attention because absorption of radioactive material is likely to be much more rapid in these areas than through the skin.

If radioactive material has entered the oral cavity, encourage brushing the teeth with toothpaste and frequent rinsing of the mouth with a 3-percent citric acid solution. If the pharyngeal region is also contaminated, gargling with a 3-percent H_2O_2 solution might be helpful. Gastric lavage can be used if radioactive materials were swallowed. Rinsing the nose with tapwater or physiological saline should be tried if the nose is contaminated. Likewise, contaminated eyes should be rinsed by directing a stream of water from the inner canthus to the outer canthus of the eye while avoiding contamination of the nasolacrimal duct. Contaminated ears require external rinsing and an ear syringe can be used to rinse the auditory canal, provided the tympanic membrane is intact.

Treatment of Internal Contamination

Once radioactive materials cross cell membranes, they are said to be incorporated. Incorporation is a time-dependent, physiological phenomenon related to both the physical and chemical natures of the contaminant. The rate of incorporation can be quite rapid, occurring in minutes or it can take days to months. Thus, time can be critical and treatment (decorporation) urgent. Several methods of preventing incorporation (e.g. catharsis, gastric lavage) might be applicable and can be prescribed by a physician. Some of the medications or preparations used in decorporation might not be available locally and should be stocked when a decontamination station is being planned and equipped. The different methods available and the specific agents used for various radionuclides are given in Table 8.

If internal contamination is suspected or has occurred, the physician or radiation safety officer should request samples of urine, feces, vomitus, wound secretions, etc. Whole-body counting and radioassay also can help evaluate the magnitude of the problem and the effect of any treatment. The contaminated patient admitted with an airway or endotracheal tube must be considered to be internally contaminated. (see Table 8).

Patient Comfort and Emotional Support

A patient involved in a radiation accident needs explanations of procedures and actions being taken (isolation, use of survey meters, taking of samples, decontamination, etc.) in the radiation emergency area. A knowledgeable person should

Table 8. Medications and Mechanisms of Decorporation.
(Modified from Safety Series 47, IAEA)

Radionuclide	*Medication*	*Applications in* *Ingestion/Inhalation*	*Applications in* *Wound*	*Principle of Action*
Iodine	KI	130 mg (tabl) stat, followed by 130 mg q.d. × 7 if indicated	Same	Blocking
Rare earths Plutonium Transplutonics Yttrium	DTPA	1 gm Ca-DTPA in 500 ml 5-percent D/W i.v. over 60 min; or 1 gm (4ml) in 6 ml 5-percent D/W by slow i.v. injection (1 min)	Irrigate wound with 1 gm of Ca-DTPA in 250 ml D5W	Chelation
Polonium Mercury Arsenic Bismuth Gold	BAL	One ampule (=300 mg) i.m. q4 hrs. for 3 days—(first test for sensitivity with ¼ amp.)	Same	Promotes excretion
Uranium	Bicarbonate	Slow i.v. infusion of bicarbonated physiological solution (250 ml at 14 percent)	Slow i.v. infusion of bicarbonated physiological solution (250 ml at 14 percent) and wash with bicarbonate	Alkalinization of urine; reduces chance of ATN
Cesium Rubidium Thallium	Prussian Blue* [Ferrihexacyano-Ferrate (II)]	1 gm in 100-200 ml water p.o. t.i.d. for several days	Same	Mobilization from organs and tissues—reduction and absorption
Radium	Ca-gluconate	May be tried: 20-percent Ca-gluconate 10 ml i.v. once or twice daily	Same	Displacement
Strontium	Ammonium chloride	3 gm t.i.d. p.o.	Same	Demineralizing agent
Tritium	Water	Have patient drink 6–12 liters of water per day	Same	Isotopic dilution
Strontium Radium	$BaSO_4$	100 gm $BaSO_4$ in 250 ml of water	Same	Reduces absorption
Calcium Barium	Sodium alginate	10 gm in a large glass of water	Same	Inhibits absorption
Copper Polonium Lead Mercury Gold	D-penicillamine	1 gm i.v. q.d. or 0.9 gm p.o. q4–6 hrs.	Same	Chelation

*Not FDA approved as of publication date answer the patient's questions and provide reassurance. For example, explain the use of protective clothing and surgical masks during treatment. Following initial care and treatment, someone with a knowledge of radiation effects should spend adequate time answering the patient's questions. Preferably, this person should be the attending physician who continues to treat the patient until discharge. Reporters and newshunters should get their reports from the hospital's public information officer.

Patient Safety

Routine precautions for patient safety should not be forgotten. Be especially alert for potential falls or slips on wet floors, excessive heating or chilling, and electrical hazards.

Documentation

In addition to routine medical records, note survey readings, samples taken (and time), descriptions of the accident, and the effectiveness of decontamination. Take care to note pre-existing conditions such as rashes, healing wounds, or scars. This information will be extremely valuable to medical consultants and health physicists in reconstructing the accident accurately and making a prognosis.

Postemergency Patient Transfer and Staff Exit from the Controlled Area

A final complete-body survey is performed following decontamination procedures. The patient's body should be thoroughly dry and all previously contaminated areas reswabbed with cotton-tipped applicators which are then marked "postdecontamination" and stored for later analysis. A new floor covering is laid from the clean area to the patient stretcher. A clean stretcher is brought in, the patient is transferred to it by clean attendants (those involved in the decontamination procedure may now be contaminated), and the patient is wheeled to the door. After the radiation safety officer makes a final check of the patient and the stretcher (especially the wheels), the patient is taken from the room.

Each member of the decontamination team goes to the control line and removes his protective clothes as described below:

1. Remove outer gloves first, turning them inside-out as they are pulled off
2. Give dosimeter to radiation safety officer
3. Remove all tape at trouser cuffs and sleeves
4. Remove outer surgical gown, turning it inside-out—avoid shaking
5. Pull surgical trousers off over shoe covers
6. Remove head cover and mask
7. Remove shoe cover from one foot and let radiation safety officer monitor shoe; if shoe is clean, step over control line, then remove other shoe cover and monitor other shoe
8. Remove inner gloves
9. Do total-body radiological survey of each team member
10. Take shower

After staff exit, the decontamination room should be secured and a sign reading *"CAUTION—RADIATION AREA"* should be posted. Unless it is needed for emergency medical reasons, the decontamination room remains secured until it can be checked and decontaminated, if necessary, by the radiation safety officer or other health physics expert.

Sources of Assistance

A number of authorities can provide advice and assistance when radiation accidents occur. In addition, some authorities have been assigned responsibilities for resolving radiological incidents. Hospital emergency department personnel should be aware of these sources of assistance. However, promptly needed treatment must not be compromised by attempts to notify specific authorities.

Sources of assistance exist at the local, state, and national levels. Call lists should be prepared to include

1. Local medical facility staffed by personnel trained in aspects of radiation accident management.
2. Local civil defense, emergency preparedness, or disaster office.
3. State radiological health office (title varies by state) might be able to provide rapid, onsite assistance.
4. U.S. Department of Energy (DOE)–DOE maintains the *Federal Radiological Monitoring and Assessment Plan* to assist state and local personnel in handling radiological incidents and accidents. Regional DOE offices are located in Upton, NY; Oak Ridge, TN; Aiken, SC; Albuquerque, NM; Argonne, IL; Idaho Falls, ID; Oakland, CA; and Richland, WA.
   REAC/TS, the Radiation Emergency Assistance Center/Training Site, Oak Ridge, TN, is part of the DOE response network. REAC/TS provides treatment capabilities and consultation assistance on a 24-hour basis, and can be reached through the Oak Ridge Hospital of the Methodist Church, 615/482-2441.
5. The Federal Emergency Management Agency's (FEMA) generic hazardous materials program encompasses both radiological and nonradiological hazards, including those originating from fixed facilities and those in transit. The objective of this program is to enhance state and local government capabilities in preparation for and response to hazardous materials incidents. While the U.S. Environmental Protection Agency has the lead federal role for nonradiological contingencies under the Superfund and other environmental legislation, FEMA has the lead federal role for coordinating offsite radiological emergency preparedness and response.

Glossary

Words in boldface type are also separate entries in this glossary.

Absorbed dose — The energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The unit of absorbed dose is the radiation absorbed dose (rad). (see **Rad; Dose**).

Activity — The rate of decay of radioactive material, expressed as the average number of nuclear disintegrations per second. (see **Curie**).

Acute radiation syndrome — The collective term for the hematopoietic, the gastro-intestinal, and the cardiovascular/central nervous system forms of response to radiation, it is a group of signs and symptoms that develop as a result of an acute, or in some cases subacute, exposure of the whole body or a significant portion of it to an appreciable dose (>100 rads) of ionizing radiation. The syndrome is a clinical manifestation of the responses of the individual constituents of the body systems to an acute exposure to radiation. The clinical course is predictable and is divided into prodromal, latent, manifest illness, and recovery or death states that are of variable duration (a few hours to several weeks) depending on the nature of the exposure.

Alpha particle — A specific particle ejected spontaneously from the nucleus of some radioactive elements. It is identical to a helium nucleus (He), which has an atomic mass of 4 and an electrostatic charge of +2. It has low penetrating power and short range. The most energetic alpha particle will generally fail to penetrate the skin. The danger occurs when matter containing alpha-emitting radionuclides are introduced into the lungs or wounds. Symbol: α.

Atom — The smallest particle of an element which cannot be divided or broken up by chemical means. It consists of a central core called the **nucleus**, which contains protons and neutrons. Electrons revolve in orbits around the nucleus.

Atomic number — The number of protons in the nucleus of an atom, and also its positive charge. Each chemical element has its characteristic atomic number, and the atomic numbers of the known elements form a complete series from 1 (hydrogen) to 103 (lawrencium). Elements with atomic numbers 104 and 105 are presently unnamed. Symbol: Z.

Background radiation — The radiation in man's natural environment, including cosmic rays and radiation from the naturally radioactive elements, both outside and inside the bodies of men and animals. It is also called natural radiation. Man-made sources of radioactivity contribute to total background radiation levels. Approximately 90 percent of background radiation from man-made sources is related to the use of ionizing radiation in medicine and dentistry.

Beta particle — A small particle ejected spontaneously from a nucleus of a radioactive element. It has the mass of an electron and has a charge of minus one or plus one. It has medium or intermediate penetrating power and a range of up to a few meters in air. Beta particles will penetrate only a fraction of an inch of skin tissue. Symbol: β^-, or β^+.

Charged particle — An ion; an elementary particle that carries a positive or negative electrical charge.

Controlled area — An area where entry, activities, and exit are controlled to assure radiation protection and prevent the spread of contamination.

Cosmic rays — High-energy particulate and electromagnetic radiations which originate outside the earth's atmosphere.

Contamination, radioactive — Deposition of radioactive material in any place where it is not desired, particularly where its presence can be harmful.

Curie — The basic measuring unit used to describe the amount of radioactivity in a sample of material. One curie is equal to 37 billion disintegrations per second. Symbol: Ci.

Decay, radioactive — Disintegration of the nucleus of unstable atoms by spontaneous emission of charged particles, electromagnetic radiation, or both.

Decontamination — The reduction or removal of contaminating radioactive material from a structure, area, object, or person.

Detector — A material or device that is sensitive to radiation and can produce a response signal suitable for measurement or analysis. A radiation detection instrument.

Dose — A general term for denoting the quantity of radiation or energy absorbed. If unqualified, it refers to absorbed dose. For special purposes it must be appropriately qualified. If used to represent exposure expressed in roentgens (R), it is a measure of the total amount of ionization that the quantity of radiation could produce in air (see **Absorbed dose**).

Dose equivalent — A quantity of measurement used in radiation protection. This term expresses all radiations on a common scale for evaluating and comparing the effects of radiation in man. It is defined as the product of the absorbed dose in rads and certain modifying factors. The unit of dose equivalent is the rem.

Dose rate — The absorbed dose delivered per unit time. It is usually expressed as rads per hour, or in multiples or submultiples of this unit, such as millirads per hour. The dose rate is commonly used to indicate the level of hazard from a radioactive source. (see **Rad**; **Dose**).

Dosimeter — A small, pocket-sized ionization chamber used for monitoring radiation exposure of personnel. Before use it is given a charge, and the amount of discharge that occurs is a measure of the accumulated radiation exposure.

Electromagnetic radiation — A traveling wave motion that results from changing electric and magnetic fields. Familiar electromagentic radiations range from those of short wavelengths, like x-rays and gamma rays, through the ultraviolet, visible, and infrared regions, to radar and radio waves of relatively long wavelengths.

Electron — An elementary particle with a negative electrical charge. Electrons surround the positively charged nucleus and determine the chemical properties of the atom. Symbol e-.

Exposure	A quantity used to indicate the amount of ionization in air produced by x- or gamma radiation. The unit is the roentgen (R). For practical purposes, one roentgen is comparable to 1 rad or 1 rem for x- and gamma radiation.
Gamma rays, or gamma radiation	Electromagnetic radiation of high energy, originating in atomic nuclei and accompanying many nuclear reactions, including fission, radioactive decay, and neutron capture. Gamma rays are identical with x-rays of high energy, the only essential difference being that the x-rays do not originate from atomic nuclei but are produced in other ways; for instance, by slowing down fast, high-energy electrons. Gamma rays are the most penetrating type of radiation and represent the major external hazard. Symbol: γ.
Geiger counter, or G-M meter	An instrument used to detect and measure radiation. The detecting element is a gas-filled chamber operated by a voltage whose electrical discharge will spread over the entire anode when triggered by a primary ionizing event.
Half-life (physical)	The time required for the activity of a given quantity of a radioactive element to decrease to half of its initial value due to radioactive decay. The half-life is a characteristic property of each radioactive element and is independent of its amount or condition. *The effective half-life of a given radioactive element is the time in which the quantity in the body will decrease to half as a result of both radioactive decay and biological elimination.*
Inverse square law	The relationship which states that gamma radiation intensity is inversely proportional to the square of the distance from a point source.
Ion	Atomic particle, atom, or chemical radical bearing an electrical charge, either negative or positive.
Ionization	The separation of a normally electrically neutral atom or molecule into electrically charged components. The term is also employed to describe the degree or extent to which this separation occurs. Ionization is the removal of an electron (a negative charge) from an atom or molecule, either directly or indirectly, leaving a positively charged ion. The separated electron and ion are referred to as an ion pair.
Ionizing radiation	Electromagnetic radiation (x-ray and gamma-ray photons) or particulate radiation (electrons, positrons, protons, neutrons, and heavy particles) capable of producing ions by direct or secondary processes.
Irradiation	Exposure to ionizing radiation.
Isotopes	Forms of the same element having identical chemical properties but differing in their atomic masses, due to different numbers of neutrons in their respective nuclei and in their nuclear properties. For example, hydrogen has three isotopes, with one, two, and three atomic mass units. H-1 is normal hydrogen, while H-2 and H-3 are commonly called deuterium and tritium, respectively. The first two of these are stable (nonradioactive), but the third (tritium) is a radioactive isotope. Other examples are the common isotopes of uranium, with masses of 235 and 238 units, respectively. Both are radioactive and emit alpha particles, but the half-life of each is different.
Mass number	The sum of the neutrons and protons in a nucleus, the mass number is the nearest whole number to an atom's atomic weight. For instance, the mass number of uranium-235 is 235. Symbol: A.
Monitoring	Periodic or continuous determination of the amount of ionizing radiation or radioactive contamination present for purposes of health protection. Also referred to as "surveying."

Nucleus, atomic	The small, positively charged core of an atom. It is only about 1/100,000 diameter of the atom but contains nearly all the atom's mass. All nuclei contain both protons and neutrons, except the nucleus of ordinary hydrogen, which consists of a single proton.
Proton	An elementary particle with a single positive electrical charge. Protons are constituents of all nuclei. The atomic number (Z) of an atom is equal to the number of protons in its nucleus.
Rad	*R*adiation *a*bsorbed *d*ose. A (rad) is the unit of absorbed dose. The rad is a measure of the energy imparted to matter by ionizing particles per unit mass of irradiated material at the place of interest. A rad is approximately equal to the absorbed dose in tissue when the exposure in air is one roentgen (R) of medium-voltage x-radiation.
Radiation	The energy propagated through space or through a material medium such as waves; for example, energy in the form of electromagentic waves or of elastic waves. Radiation, or radiant energy, when unqualified, usually refers to electromagnetic radiation; such radiation commonly is classified, according to frequency, as Hertzian, infrared, visible (light), ultraviolet, x-ray, and gamma ray. Also, particles such as alpha and beta radiation, or rays of mixed or unknown type—for instance, cosmic rays — can be called radiation.
Radiation accident	An accident in which there is an unintended exposure to ionizing radiation or radioactive contamination.
Radiation sickness	The prodromal manifestations of acute radiation injury, varying in severity, scope, and cause, depending on the conditions of exposure to ionizing radiation (see Acute radiation syndromes).
Radioactivity	The spontaneous emission of radiation, generally alpha or beta particles often accompanied by gamma rays, from the nucleus of an unstable atom. As a result of this emission, the radioactive atom is converted, or decays, into an atom of a different element that might or might not be radioactive. Ultimately, as a result of one or more stages of radioactive decay, a stable, nonradioactive atom is formed.
Rem	*R*oentgen *e*quivalent *man*—a special unit of radiation dose equivalent. The dose equivalent in rems is numerically equal to the absorbed dose multiplied by the quality factor (Q), the distribution factor, and any necessary modifying factors.
Roentgen	The unit of exposure from x- or gamma rays. (see Exposure).
Sealed source	A radioactive source, sealed in an impervious container, which has sufficient mechanical strength to prevent contact with and dispersion of the radioactive material under the conditions of use and wear for which it was designed. Generally used for radiography or radiation therapy.
Shipping papers, or shipping documents	Forms containing a description of the materials being transported which must accompany all packages of radioactive material.
Survey instrument	A portable instrument used for detecting and measuring radiation under varied physical conditions. The term covers a wide range of devices.
Whole-body (total) exposure	An exposure of the body to external radiation, where the entire body rather than an isolated part is irradiated. When a radioactive material is uniformly distributed throughout the body tissues rather than being concen-

trated in certain organs, the irradiation can be considered whole-body exposure.

X-rays Penetrating electromagnetic radiation whose wave lengths are shorter than those of visible light. They are usually produced by bombarding a metallic target with fast electrons in a high vacuum. In nuclear reactions, it is customary to refer to photons originating in the nucleus as gamma rays, and to those originating in the extranuclear parts as x-rays. These rays are sometimes called roentgen rays after their discoverer, W. C. Roentgen.

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UNIVERSITY OF ALABAMA HOSPITAL

RADIATION CASUALTY TREATMENT FACILITY (RCTF)

JANUARY 1, 1989

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INTRODUCTION

Through a contractual agreement with the Alabama Power Company (APC), a Radiation Casualty Treatment Facility (RCTF) has been established at the University of Alabama Hospital to provide the medical services of a multidisciplinary staff to persons who have been exposed to serious radioactive contamination or suffer from radiation injury.

Through renovation, portions of the physical facilities in the Emergency Department and on the northeast wing of the 9th floor of the Spain Wallace Building have been transformed into the RCTF for treating and housing casualties. [1] The RCTF consists of a 9 patient room unit housing a maximum of nine casualties, a nursing station, utility room, storage cabinet, treatment and examination rooms, and triage area.

The RCTF has been established primarily for the APC employee who has been contaminated and/or irradiated at the Joseph M. Farley Nuclear Plant. However, with the permission of the APC, the facility may be used for treating persons injured in radiation accidents occurring at other sites. The facility may also be used by the Hospital on a day-to-day basis for other medically important purposes.

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[1]*Where instructions in this plan refer to RCTF Facilities located in the Emergency Department and triage area, this will be designated RCTF-ED. Where instructions refer to facilities located on 9 north/east nursing unit, this will be designated RCTF-9N/E Wallace.*

The University of Alabama Hospitals has prepared an Emergency Radiation Plan which is presented on the pages that follow. Included in the Emergency Radiation Plan are:

- Three distinct procedures for initiating an EMERGENCY TYPE R:
- A call list containing the names of those persons and their alternates who are to be notified of an EMERGENCY TYPE R:
- Standard operating procedures of the various departments and units responding to an EMERGENCY TYPE R.

NOTIFICATION-I

An accident occurs at the Joseph M. Farley Nuclear Plant in Which Personnel are exposed to serious radioactive contamination or radiation injury.

The Alabama Power Company Emergency Coordinator shall notify the University of Alabama Hospitals Switchboard (934-4011) that an accident has occurred at the Joseph M. Farley Nuclear Plant. The Switchboard shall ask the name of the person calling and the number at which they can be reached.

In the event that all switchboard lines are busy. Alabama Power Company Emergency coordinator shall call the emergency department, phone 934-5105, who shall then notify the switchboard.

The Switchboard shall notify the Administrator on duty that an accident has occurred (EMERGENCY TYPE R), and the name and number of the person who placed the call. The Administrator on duty shall call the Alabama Power Company Emergency

Coordinator, as listed below to verify that there has been an accident and to obtain as much of the following information as possible:

1. Telephone number for the Emergency Department to communicate with Southeast Alabama Medical Center.
2. Number of casualties.
3. Estimate of the severity of injuries, including whether contaminates are present, exposure only, or both.
4. Names and ages of casualties.
5. Method of transport to RCTF-ED.
6. Present location of casualties.
7. Estimated time of arrival (ETA), at RCTF-ED.
8. If injury occurred at a facility, have facility safety officer call the Medical Director of RCTF or leave phone number.

EMERGENCY COORDINATORS:

NAME	OFFICE PHONE	HOME PHONE	PAGER
J. D. Woodard	868-5086	995-1422	877-7243 (5086)
J. E. Garlington	868-5131	987-1451	877-7243 (5131)
B. D. McKinney	868-5982	631-4058	877-7243 (5982)

Should the Alabama Power Company Emergency Coordinator be absent, the Administrator on duty shall contact either:

Dr. C. H. Colvin
250-2202
871-6923-Home
251-8088-Answering Service
591-0553-Private practice
954-2978-Paging

Dr. M. Bradley
250-2202
879-0224-Home
320-3360-Answering Service
933-7301-Private Practice

Dr. J. D. Carmichael
250-2202
879-7849-Home
251-8088-Answering Service
933-5972-Private Practice
941-7259-Paging

The Administrator on duty shall contact the Medical Director of the RCTF to determine the extent to which the Emergency Radiation Plan shall be activated.

Should a Decision be made to activate only select portions of the plan, the administrator on duty and the medical director of the RCTF shall contact the necessary personnel.

Should a decision be made to activate the entire plan, the administrator on duty shall call the switchboard and instruct her to activate the RCTF call list announcing an EMERGENCY TYPE R and the ETA. After activating the call list, the switchboard shall call the administrator on duty to give him/her a status report regarding notification of personnel.

Should a decision be made to activate the plan, the administrator on duty should notify the following:

STATE DEPARTMENT OF RADIOLOGIC HEALTH, 220-5315 (nights and weekends call Radiologic Health at 261-5315 and ask for code 215). President of UAB, Dr. Charles McCallum, Ext. 4533, Senior Vice President of Health Affairs Dr. John Durant, M. D.

EMERGENCY DEPARTMENT ADMINISTRATIVE OFFICER - Jim Raper

HOSPITAL ADMINISTRATIVE STAFF

NOTIFICATION II

An accident occurs in which persons are exposed to serious radioactive contamination or radiation injury.

The University Hospitals Em... Department or Switchboard is notified that an accident has occurred. The hospital personnel receiving the notification shall ask the name and telephone number of the person calling, and the name and telephone number of a contact person with whom the University Hospital may communicate.

(In cases when the Switchboard is notified, the call should be transferred to the Emergency Department Attending Physician.) Once informed of the situation, the UED attending physician, after immediate consultation with the radiation safety officer/designee on call, shall notify the Administrator on duty that an accident (EMERGENCY TYPE R) has occurred and shall inform him of the name and telephone number of the person calling and the name and telephone number of a contact person. The Administrator on duty shall call to verify that there has been an accident and to obtain as much of the following information as possible:

1. Telephone number for the Emergency Department to communicate with personnel transporting the radiation casualties.
2. Number of casualties.
3. Estimate of the severity of the injuries, including whether contaminates are present, exposure only, or both.
4. Names and ages of casualties.
5. Method of transport to RCTF-ED.
6. Present location of casualties.
7. Estimated time of arrival (ETA) at RCTF-ED.

8. If injury occurred at a facility, have facility safety officer call medical director and leave phone number.

The Administrator on duty shall contact the medical director of the RCTF to determine the extent to which the Emergency Radiation Plan shall be activated.

Should a decision be made to activate only select portions of the plan, the administrator on duty and the medical director of the RCTF shall contact the necessary personnel.

Should a decision be made to activate the entire plan, the administrator on duty shall call the switchboard and instruct her to activate the RCTF call list announcing EMERGENCY TYPE R and the ETA. After activating the call list, the switchboard shall call the administrator on duty to give hem/her a status report regarding notification of personnel.

Should a decision be made to activate the plan, the administrator on duty should notify the following:

STATE DEPARTMENT OF RADIOLOGIC HEALTH, 220-5315 (nights and weekends call 261-5315 and ask for Radiologic Health or ask for Code 215).

President of UAB, Dr. Charles McCallum, Ext. 4533, Senior Vice President of Health Affairs, Dr. John Durrant

EMERGENCY DEPARTMENT ADMINISTRATIVE OFFICER - Jim Raper

HOSPITAL ADMINISTRATIVE STAFF.

NOTIFICATION III

Person(s) who have been exposed to serious radioactive contamination or radiation injury arrive unannounced at University Hospital's Emergency Department.

The Emergency Department physician shall monitor the amount of contamination, survey the extent of injuries, and inform the Administrator on duty and the Radiation Safety Office of the results.

Upon notification by and consultation with the Emergency Department physician, the Administrator on duty shall contact the Medical Director of the RCTF to determine the extent to which the Emergency Radiation Plan shall be activated.

Should a decision be made to activate only select portions of the plan, the administrator on duty and the medical director of the RCTF shall contact the necessary personnel.

Should a decision be made to activate the entire plan, the administrator on duty shall call the switchboard and instruct her to activate the RCTF call list announcing emergency type R and ETA. After activating the call list, the switchboard shall call the administrator on duty to give him/her a status report regarding notification of personnel.

Should a decision be made to activate the plan, the administrator on duty should notify the following:

STATE DEPARTMENT OF RADIOLOGIC HEALTH, 220-5315 (nights and

weekends call 261-5315 and ask for Radiologic Health or ask for code 215).
President of UAB Dr. Charles McCallum, ext. 4533 Senior Vice President of Health Affairs, Dr. John Durant

EMERGENCY DEPARTMENT ADMINISTRATIVE OFFICER - Jim Raper

Hospital Administrative Staff.

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RADIATION CASUALTY TREATMENT FACILITY

CALL LIST

1/13/88

The Radiation Casualty Treatment Facility Call List contains the names of those persons and their alternates who are to be notified of an EMERGENCY TYPE R. In some instances, the persons to be notified will vary according to the time of day the Hospital is notified of a radiation accident involving casualties. An "or" indicates an alternate to be called if the primary contact person is not readily available.

DEPARTMENT	NAME	TITLE	UH	HOME
Administration	James E. Moon or administrator on duty	Administrator	5314	595-6150
Radiation Safety	Bill Bass	Radiation Safety Officer	4751	822-5773
	Bufford Smith	Assistant Radiation Safety Officer	4751	833-3742
Emergency	Charge Nurse (who will notify necessary staff)		5105	
RCTF (Medical Director)	Dr. Albert Lobuglio	Prof. & Dir. Hematology Oncology	5077	979-1247
	Dr. Kenneth Zuckerman	Asso. Prof. of Medicine & Deputy Dir. of Hemo/Onco	3812	967-5197
Nuclear Medicine	Dr. Eva Dubovsky or	Prof. & Dir. Nuclear Med. Dir.	2140	822-7049
	Dr. Michael Yester or M.D. on call	Physicist	2140	592-4001

Chief-of-Staff	Dr. J. Durwood Bradley		5376	328-0651
	Dr. Rostand		5058	870-1916
	Dr. Richard McElvein		5058	870-5288
Operating Room	Charge Nurse (who will notify staff)		5141	
Admitting	Preston Golfarb	Director	2394	967-3717
	or Mary Owens or	Asst. Dir.	4501	
	Fay Nall (5p.m-10p.m)	Supv.	4456 or 6600	
	or Sr. Admitting Clerk (10:30p.m. to 5:30 a.m.)		4456	
9NE Spain Wallace	Charge Nurse (who will notify necessary staff)		9793	
Environmental Ser.	Jim Martin	Director	4288	426-6784
	Calvin Joshua	Asst. Dir. Evening & Night Shifts	4288	925-4513
Police	Roy Kirkpatrick	Chief of Police	4434/2297	979-1237
	Lt. Strunk or Officer on call		4434/2297	979-5651
Institutional Relations	Gloria Goldstein	Director	3884	871-5302
Information Coordinator	Hank Black		6350	
Radiation Oncology	Norbert Black		2756	426-5717

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A. RADIATION SAFETY DIVISION

EMERGENCY TYPE R

Once the Radiation Safety Officer (RSO) has been notified of the nature of the emergency, he will make use of all available information given to him by the Administrator on duty to aid in the provision of appropriate health physics support. Depending on the information given, the RSO may: request support in having the available portable radiation shadow shields on 6NW Spain Wallace delivered to the Emergency Department, and to obtain help, page or call Environmental Services supervisor. The RSO will then contact his assistant (ARSO), give a brief description of the situation, the estimated time of arrival (ETA) of the casualties, and the additional equipment and supplies that would be needed. He will then proceed directly to the radiation safety office. **(In the event of Notification II or III, the RSO will proceed directly to the RCTF-ED after notifying the ARSO.)** The ARSO then alerts the other members of the radiation emergency response team, notifying as many of them (See the call list in Attachment A-1) as is possible. He will relate the ETA of the radiation casualties at the RCTF-ED and have each individual notified give their own ETA at the RSD office. Once the available members of the response team have been contacted, the ARSO will call the Radiation Safety Office and give the RSO the status of team response and the ETA for the team. The RSO will then notify the Emergency Department, give the ETA of the radiation emergency response team at the RCTF-ED, and obtain information on any developments. The RSO will then notify the Director of the Occupational Health and Safety Department, and briefly apprise him of the situation. Time permitting, he will attempt to call some of the team members who could not be contacted earlier. If contacted, they would be told to proceed directly to the RCTF-ED.

Upon the arrival of team members, they will gather designated equipment and supplies (See Attachment A-2) and any additional equipment and supplies, as directed by the RSO. The RSO will assign or reassign team duties depending on team response. As soon as the ARSO arrives at the Radiation Safety Office, he will assume command of the team, and the RSO will then immediately proceed to the RCTF-ED where he will be briefed by the Medical Director on the current situation and the medical priorities. The rest of the team will proceed to the RCTF-ED after arranging for transport of the equipment and supplies needed there. If casualties have already arrived at the RCTF-ED when alerted, the RSO shall pick up a GM survey meter with a thin window probe, a portable ionization chamber meter, and a neutron meter (if necessary).

Following the briefing given by the Medical Director, the RSO will then prepare the RCTF-ED for the radiation control necessary for handling radioactively contaminated casualties. He will ensure that adequate security against unauthorized entrance to the RCTF-ED is provided. He will see that the seldom used stairwell at the rear of the facility is roped off with affixed Radiation area caution signs to warn those who might approach the facility during the radiation emergency. He will also ensure that the metal, roll-up door separating the RCTF-ED from the rest of the Emergency Department is closed, and that the special air flow system is activated.

RADIATION MONITORING STATIONS

Background surveys of radiation levels in all areas within RCTF-ED will be performed prior to the arrival of the radiation casualties. These will serve as a baseline from which to evaluate all levels of radiation measured during casualty treatment.

Upon the arrival of the RSD emergency response team, the RSO will see that the radiation monitoring stations are set up in Room 10 and Room 11 of the RCTF-ED. These rooms will provide radiation control and survey points to limit the spread of any radioactivity which might be brought within the boundaries of the designated "hot areas" in the facility. Room number 11 is expected to be the most contamination free of all the areas of the RCTF-ED, and any contamination that occurs on the floor covering will be immediately cut out, and the floor recovered and resurveyed as free of contamination. With the exception of the casualties, support health physics personnel (from Alabama Power Company), and the "ambulance reception team", only authorized personnel will be allowed to enter the RCTF-ED from the front of the Emergency Department and only through this room. Once contaminated casualties have been taken into the facility, radiation surveys for "contamination free" clearances and authorization to leave the facility, will be initiated and performed here. No individual will be allowed to leave unless they have been given the proper clearance to do so. Only the "exit monitor", designated by the RSO, will have the authorization to grant this clearance. The exit monitor will be stationed in Room 11 at the entrance to Room 10 performing the final survey of individuals as they leave Room 10 crossing into Room 11. Room 11 will also be used by the radiation team dosimetry technician for the distribution of the personnel radiation badges, the direct-reading dosimeters, and the protective clothing. All documentation involving the issue of the badges and dosimeters and their readings will be maintained here. The 50R gamma radiation dosimeters will be issued only if the RSO determines that expected radiation levels from casualties will require their use. If so, these will be issued in addition to the 5R gamma dosimeters and the 5R neutron dosimeters issued only to those physicians and nurses attending those casualties with the highest contamination rates. To avoid confusion during distribution, protective clothing and radiation monitoring equipment shall be kept together in a labeled plastic bag for each individual assigned to the entire emergency response team. This will enable the quick preparation of each of the members of the response team. Half-face respirators shall be included only if the RSO determines that this is necessary for the safety of all personnel involved. The direct reading dosimeters within each bag shall be zeroed by the team dosimetry technician. The names of all personnel entering the RCTF-ED through this point will be recorded by the dosimetry technician. After casualty treatment has been initiated, the dosimetry technician will collect the dosimeters (if they are unneeded elsewhere) and take the readings of all direct reading dosimeters of individuals leaving Room 11. Changes in the protective clothing of anyone leaving the "hot area" of the facility will occur there in Room 10. The floors of all of the room within the RCTF-ED (including Room 11) will be completely covered with water proofed bench paper.

Room 10 will serve as a cross-over control area between two different radiation zones; the designated "hot area" where the casualties will be treated and the contaminated free area of Room 11. The often used light switches, other switches or buttons, and door knobs in these two rooms will be covered with plastic bags taped over them in a manner that will allow them to function properly. RSD team "crossover monitors" will monitor all individuals, materials, and equipment entering Room 10 from the radiation casualty treatment room. Materials and equipment that are contaminated (as shown by survey) shall be placed and sealed in plastic bags. Any contaminated articles or clothing belonging to casualties and specimens designated for laboratory work will also be placed in plastic bags, labeled, and properly documented. Specimen control numbers will be utilized to identify casualty specimens. If necessary, the laboratory specimens will be placed in special containers made of lead to provide adequate shielding. A designated member of the RSD response team will accompany any laboratory specimens sent to the clinical laboratory for analysis. The laboratory request form shall note the amount of contamination, if any, on any specimen. "No contamination" indications would also be noted thereon for samples with no contamination (Also refer to Laboratory Procedure Section C). Both the individual dispatched to the clinical laboratory and the specimen containers will be checked for contamination upon leaving Room 10. It there is no contamination that resides with any of the specimens taken to the clinical laboratory, this individual will return to the RCTF-ED. If, however, there are indications of contamination on these samples, this individual will remain at the clinical laboratory to supervise the radiation safety aspects in handling these specimens. Specimens shall be refrigerated.

Portions of specimens intended for radioactive analysis only, shall be dispatched to the Radiation Safety Division, Room 445 CHSB, by a separate individual and analyzed there for radioisotope identification and quantification.

At the early stages of response there will be no provision to decontaminate any equipment unless it is absolutely required for use. Any contaminated articles belonging to the casualties will not be decontaminated but only saved for further analysis later in radiation dose measurement.

RADIATION CASUALTY TREATMENT ROOM

No individual, other than members of the RSD radiation emergency response team, shall be allowed to enter this area without the permission of the physicians or charge nurse. Those that have this authorization shall be required to wear one scrub suit and one operating gown, caps, surgical masks, shoe covers, and surgical gloves (double glove made of latex). Disposable utility uniforms, maintained in the UED, maybe worn as an alternative to the surgical gown. However, a plastic apron must also be worn to provide a fluid barrier. The sleeves and legs of the scrub suits will be taped to wrists and ankles, respectively. The RSD personnel will work together with the UED personnel and help each other with their protective clothing. The RSO must ensure that adequate protective clothing is provided and properly worn by all emergency response personnel.

During use, the outer latex gloves of all personnel should be surveyed frequently and should be changed as often as is reasonably achievable to minimize the spread of radioactive contamination. If half-face respirators are required by the RSO, these will be periodically surveyed for contamination deposits near the air inlets to the masks.

AMBULANCE AND CASUALTY RECEPTION

When the casualties arrive at the RCTF-ED via the 6th Avenue South rear entrance (See Appendix 1 for the entrance route), the RSD "Ambulance Reception Team" shall monitor the exposure rate at the vehicle door if contamination is suspected. An immediate check for removable contamination shall be made by two members of the reception team working together. One of these individuals, using serially numbered filter paper, will take wipe samples of the vehicle's interior and articles within the vehicle. Each of the wipe samples will be monitored separately at a distance from the vehicle by the other individual. A thin-window GM probe and neutron detector will be used to determine if any contamination is present on any of the wipe samples. Any contaminated articles will be immediately bagged, labeled secured, and shielded (if necessary). All wipe samples will be placed in glassine envelopes and saved for further analysis. A wipe sample survey worksheet shall be utilized to document the preliminary results of these contamination surveys. The radiation levels of the wipe samples at a near but not touching distance will be recorded on this worksheet. It is very important that proper documentation be maintained at all stages of team response. The names of all radiation casualties, ambulance attendants, and other individuals arriving with the ambulance will be documented on the vehicle survey worksheet.

If there is evidence of contamination, and it is necessary to transfer the casualties to the RCTF-ED for emergency care, the casualties shall be wrapped in at least two sheets before leaving the vehicle. If casualties are contaminated with activities giving instrument readings (at contact) greater than 10,000 cpm, and if emergency care is not immediately necessary, their clothing shall be replaced with hospital gowns or scrub suits. Protective shoe covers should be placed on their feet as they leave the vehicle. They will then be taken to an area away from the vehicle where they will be scanned with a partial body counter to obtain more information concerning the radiation contaminants.

CASUALTY RECEPTION AREA

RSD "casualty treatment monitors" shall monitor the casualties taken to the receiving area of the radiation casualty treatment room. There, all contaminated clothing and personal items shall be placed in bags and labeled. They will place the bags in the 55 gallon barrels until such time as the contents may be properly decontaminated or disposed. Sufficient numbers of barrels and plastic bags shall be available to handle contaminated articles. The casualty treatment monitors shall also establish time limits so that no individual shall receive more than a 25 rem dose. The direct reading dosimeters and other dosimeters will be read as frequently as necessary to insure that no individual even closely approaches the 25 rem limit. Portable lead shields will be utilized and positioned to minimize occupational exposure and exposure to other victims. If necessary, plans will be made by the RSO to utilize the large lead shadow shields available from the GYN Oncology nursing unit (6NW Spain-Wallace) and (9NW).

After emergency care has been given and the casualties have been decontaminated, they shall have to be moved to Room 10 to be monitored by the designated "crossover monitors" stationed there. Before this is done, the crossover monitors will put down new floor covering in this room. Next, clean stretchers will be passed into Room 10 through Room 11. Then the casualties will be brought into Room 10 and placed ont he stretchers. Before transferring the casualties to Room 11, they will be monitored again by the exit monitor stationed in Room 11. There they can then be given clearance for departure from the RCTF-ED, at which time they shall then be transported (to OR. or RCTF-9NE Wallace) along designated routes cleared by the RSD "route team" and police officers.

After consultation with the RSO regarding the contamination rate, should the physician decide that a casualty must be sent to O.R. without first being decontaminated, the following procedures shall apply:

1. The contaminated portions of the casualty shall be covered with two layers of protective covering such as one cotton sheet covered with one plastic sheet.
2. If the casualty is exhaling contamination or if airborne contamination exists, the casualty and attending personnel must wear surgical masks.
3. The casualty shall be transferred to a clean stretcher following procedures previously described.
4. RSD route team and police officers shall seal the pathway to O.R.

All removal of the protective clothing and personnel monitoring equipment shall be under the direction of the RSO or his assistant. If further care is needed by one of the responding physicians or nurses at the O.R. then more protective garb shall be issued at that site.

Upon completion of RCTF response all personnel shall be surveyed for radioactive contamination. This survey shall consist of external monitoring and analysis of nasal smears, skin wipes, and urine specimens.

Attachment A-1

RADIATION SAFETY OFFICE CALL LIST

The telephone number of the Radiation Safety Office from Monday through Friday during 8:00 a.m. to 5:00 p.m. is 934-4751. Listed below are the names and phone numbers of Radiation Safety Office Personnel:

Dial 934-3411 for Page operator UH

William B. Bass
Radiation Safety Officer
Page 2735 Home: 822-5773

Cecil Knight
Assistant Radiation Safety Officer
Page 2731 Home: 631-3473

Susan Robinson
Chief Technician
Page 2670 Home: 987-2571

David Walter
Health Physics Technician I
Page 2140 Home: 664-1181

Sherry Sellers
Health Physics Monitor Technician
Page 2212 Home: 979-6563

Lawrence McDermott
Hazardous Material Manger
Page 2749 Home: 987-3254

Errol Commack
Hazardous Waste Supervisor

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Page 2747 Home: 251-6483

Jerry Thomas
Radiation Safety Staff
Page 2733 Home: 497-0981

Keith Manasco
Radiation Safety Staff
Page 2745 Home: 631-7792

ATTACHMENT A-2

EQUIPMENT STORED IN RADIATION SAFETY OFFICE

2 -- GM Survey Meters

2 -- Cutie-pie type ionization chambers

30 --Film badges or thermo-luminescent dosimeters

24 --Finger rings

4 --Lapel air samples

6 --Half face respirators

*1 --Partial body counter

1 --Extension cord

Continuation of A-2

ATTACHMENT A-2

RADIATION SAFETY DIVISION EQUIPMENT

2 -- 55 gallon barrels lined with plastic bags

1 -- case large plastic bags

1 -- case small plastic bags

3 -- rolls bench paper

1 -- bottle or can decontamination agent; i. e., Iso-Clean, Potassium Permanganate

1 -- box cornmeal

6 -- legal size note pads

Continuation of A-2

6 -- pencils or pens

6 -- mark-a-lot pens

1 -- long rope (100 ft.)

6 -- Radiation area signs

6 -- rolls masking tape

30-- lead containers for specimens

24-- surgical masks

Specimen data forms

Electrical extension cord (100 ft.)

Portable lead shields (6NW-Wallace nursing unit)

NOTE: Quarterly inventory should be performed

B. EMERGENCY DEPARTMENT

Upon notification by the Switchboard of an EMERGENCY TYPE R, and casualties; eastern time of arrival, a Control Center shall be established in the communications room of the emergency department for communicating with Farley Nuclear Plant, Southeast Alabama Medical Center (SEAMC), Alabama Power Medical Department personnel, and/or any personnel transporting the radiation casualties to the RCTF-ED. Emergency Department extension 934-2312 will be established as the open communication line.

The Emergency Department Nurse Manager or alternate shall:

1. Call in necessary UED staff.
2. Assist the senior staff physician in clearing the Emergency Department of patients, keeping only emergencies of a life threatening nature.
3. Check supply cabinet (see attachment B-1) which shall be stored in the ED.
4. Check involved ED personnel to assure all are wearing required protective clothing. (See Section A, Radiation Safety Office.)
5. Prepare treatment area for injured persons by doing the following:

   Remove all equipment and supplies that are not to be used.

   Secure stretchers for the treatment rooms.

   Set up table tops for decontamination (decontamination table top to be maintained in Emergency Department).

   Put down protective floor covering in RCTF-ED and in rear exit hallway and rear outside ramp. (bench paper which shall be stored in ED)

Provide the elevator key to the security personnel so they can lock out elevator #8 for UED use.

Close metal roll-up door separating treatment area from ED.

Activate special air flow system for the RCTF-ED.

6. A registered nurse from 10 West nursing unit shall report to the UED to provide nursing care for patients which cannot be immediately evacuated from the ED. (Available ED nursing staff will be preparing for reception of radiation victims.) If the workload demand for routine ED patients is greater than can be managed by ED nurses and the 10 West R.N., the 10 West nurse shall notify the head nurse on call for the Surgical Nursing Division to request additional support from available in-house surgical nursing division personnel. As a temporizing measure, the head nurse on call will provide this needed support. When off duty UED nursing personnel arrive int he UED the Surgical Nursing Division personnel will be relieved of ED responsibilities.

Receiving (location-rear outside entrance of Emergency Department)

1. The radiation casualties shall be met outside the Emergency Department by physicians, nurses and Radiation Safety personnel.
2. Radiation Safety personnel and triage physicians shall evaluate casualties; nurses shall assist.
3. All casualties that are received from Farley Nuclear Plant shall be wearing a non-removable hospital type wrist band showing their

name and identification that has been placed by Farley Nuclear Plant personnel.

4. The nurses shall assist in removing casualties' clothing and shall wrap the casualties in sheets.

5. As time [illegible], the nurses shall label clothes and valuables to be placed in bags provided by Radiation Safety personnel. Casualties shall then be transported to the treatment area by the Emergency Department rear entrance (see Appendix 1).

Decontamination area, (RCTF-ED rear area, first floor-rooms 8 & 9).

1. Casualty's conditions shall be evaluated by the physicians.

2. The nurses shall obtain minimal chart information for clerical personnel.

3. The nurses shall collect and properly label lab specimens (see Section C lab procedures) and dirty linen.

4. If necessary, decontamination of the casualty shall occur. This process shall be: rinse the casualty with water; monitor; repeat. This process may be continued until the casualty's skin becomes reddened. If the casualty is still contaminated, other decontaminates such as potassium permanganate (KMNO4), shaving cream, and cornmeal with Tide may be used as the physician deems necessary.

Clean area (Room 11)

Once casualty is stable and decontaminated, the clean staff shall move him to clean area 11 to be monitored once again before leaving the area.[2]

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[2] *ED charge nurse will designate the staffing for each room in the RCTF-ED.*

Upon notification by the physician that the casualty is ready to leave ED, Radiation Safety personnel and clean nurses shall put down new floor covering in order to bring clean stretchers into Clean Area 11. Casualty shall be moved to Clean Area 11 by clean staff, monitored again and then moved to another stretcher and transported to RCTF-9N/E Wallace or OR (Appendices 2, 2A, 3) by ED personnel and Radiation Safety personnel.

ED personnel and Radiation Safety personnel shall transport casualties to RCTF-9 N/E Wallace via elevator #8, and the Via sixth floor to elevator #5 to ninth floor. Upon direction of the attending physician, physicians from Nuclear Medicine, and the Radiation Safety Officer, casualties who are contaminated and present a hazard to staff and patients shall be decontaminated as thoroughly as possible, double wrapped, and transported via ambulance by UED personnel to room T-021, in the basement of the Lurleen Wallace Tumor Institute, (see Appendix 4) where they shall receive the necessary care. Hospital nursing service will provide the nursing care for these patients. These nurses will be identified by nursing administration. Portable shields are available for transport if necessary. Also, lead lined rooms are available on 9NW Wallace (Rooms 918, 920, 922, 924, 926). (See Appendix 3) (See page 34 for further details).

Contaminated casualty who must go immediately to O.R.

This decision shall be made by the physician after discussing the amount of contamination with Radiation Safety personnel.

1. Cover contaminated portions of casualty with two layers of protective covering (e.g., one cotton sheet and one sheet of plastic).

2. Provide surgical masks for all personnel and the casualty if casualty has respiratory contamination or if airborne contamination exists.

3. Transfer casualty to clean stretcher using previously described procedure.

4. Pathway to O.R. shall be sealed off by police and Radiation Safety personnel (refer to Appendices 2, 2A for route).

5. Preparation of O.R.: personnel mask, double gowns and double gloves are necessary for all personnel before the patient is touched. A member of the operating room team assigned to this patient will meet the casualty and escort team at elevator #8 on the 7th floor.

6. Only Room 17 or Room 18 are used for scheduled radiation contaminated cases. If there is a case in progress the patient will be held in the ER until case in progress is completed.

7. Post-op the patient will be recovered in the OR. When recovered, the patient shall be transferred to a clean stretcher, covered with one plastic, one cotton sheet and transferred to 9NE/Wallace as per hospital plan.

8. For further information see: Section F. Operating Room.

ATTACHMENT-B-1

Supplies for Emergency Department
To be Stored in Emergency Department

2	Suture trays	4	Clings
2	Cut down trays	4	Arm Boards
4	Betadine solution	1	Resuscitation Kit
2	Xylocaine 1%	1	Drug Kit
4	50 cc syringes	20	4x4's (10/pkg)
10	10 cc syringes	4	Distilled water
5	needles 18 gauges	6	ring forceps
5	needles 25 gauges	2	basins
6	IV administration sets	6	sanitary napkins
6	ringers lactate	20	plastic bags (large)
4	D5 1/2 n.s.	8	gloves 6 pair each, size 7 1/2
4	C.V. Lines	6	Emesis basins
2	Angio cath #16	4	Asepto syringes
2	Angio cath #18	24	Chucks
2	Angio cath $\#20		Tide
2	Tape, masking		Cornmeal
6	Kits (clothing)	24	pair water proof shoe covers
1	pad. in-coming traffic control sheet	1	GM survey meter
1	roll of plastic	3	pair scissors
4	5 gal. plastic carboys	12	lead bricks

C. LAB

Decisions regarding the collection and analysis of specimens from each patient will be marked by the Director of E.D., Director of the RCTF and the Radiation Safety Officer.

Emergency department personnel shall place specimen from radiation casualties into lead containers. These containers shall be labeled with radioactive stickers and marked that they are from radiation casualties. Specimen data sheets shall be completed to identify the specimen and the area of the patient's body from which it was obtained and the time.

D. RCTF-9NE/WALLACE

The Charge Nurse on 9NE/Wallace shall be informed by the Switchboard of an Emergency Type R and the casualties' ETA at the RCTF-ED.

The Charge nurse shall alert the head nurse, the Director of Medical Nursing, and the Fellow for the Hematology/Oncology Service. The head nurse taking call for the Medical Nursing shall also be notified.

The Director of Medical Nursing or designee (nurse taking call for Medical Nursing office) shall reassign additional nursing personnel to 9NE/Wallace.

If necessary, the charge nurse on 9NE/Wallace shall notify environmental services to request that the vacated rooms on 9NE/Wallace be cleaned and readied for the casualties.

If the estimated time of arrival of casualties to the RCTF-ED is MORE than 2 hours, the following applies:

1. The charge nurse on 9NE/Wallace and the Fellow for the Hematology/Oncology Service shall assess the condition of each patient on 9NE/Wallace in preparation for evacuating the unit.

2. Patients shall remain on 9NE/Wallace until the administrator on duty and the director of admitting determine the availability of vacant beds in the Hospital.

3. The director of admitting shall call the charge nurse on 9NE/Wallace and report rooms where patients may be transferred. This should be coordinated with nursing service.

4. The charge nurse on 9NE/Wallace and the Fellow for Hematology/Oncology Service shall determine which locations are preferable.

5. Patients and personal belongings shall be transported to newly assigned rooms by 9NE/Wallace nursing personnel.

6. The unit secretary on 9NE/Wallace shall inform the Director of admitting of new locations of patients.

If the estimated time of arrival of casualties to the RCTF-ED is LESS than 2 hours, the following applies:

1. The charge nurse on 9NE/Wallace and the Fellow for the

Hematology/Oncology Service shall assess the condition of each patient in preparation for evacuating the unit.

2. Patients from 9NE shall be transferred by patient transport and 9NE nursing personnel to other vacant beds in the hospital.

3. The charge nurse on 9NE/Wallace shall alert the recovery room charge nurses that remaining patients on 9NE/Wallace shall be transferred to the recovery room.[3]

4. Patients on 9NE shall be transferred to the recovery room by 9NE nursing personnel and/or patient escort.

5. Personal belongings of patients from 9NE shall be removed from the unit by 9NE nursing personnel, identified and labeled, and locked and stored temporarily in the waiting room outside the recovery room.

6. Patients shall remain in the recovery room until the administrator on duty and the director of admitting determine the availability of vacant beds in the hospital.

7. The director of admitting shall call the charge nurse in the recovery room and shall report rooms where patients may be transferred.

8. The charge nurse in the recovery room shall notify the fellow from hematology/oncology service who shall determine, with input form

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[3] *If there are no vacant beds in the recovery room, 9NE/Wallace patients shall be moved to the hallways on 9NE/Wallace until the Director of admitting locates available beds.*

Medical Nursing, which locations are preferable.

9. Patients and personal belongings shall be transported to newly assigned rooms by recovery room nursing personnel.

10. The charge nurse in the recovery room shall inform the director of admitting of new locations of patients. After 9NE/Wallace has been evacuated, environmental services aides shall clean vacated rooms immediately.

E. RCTF - LURLEEN WALLACE TUMOR INSTITUTE

Patients that cannot be decontaminated completely and are transported to the basement of the Lurleen Wallace Tumor Institute will be cared for in that area by medical nursing personnel. Once the 9NE Wallace unit has been notified that patients will be sent to the Tumor Institute, the charge nurse will identify the appropriate number of nurses plus one unit secretary to take secretarial supplies and to the room in the Tumor Institute to prepare for patients. The following departments need to be notified immediately of the T.I. patients by one of the unit secretaries on 9NE. The unit secretary must specify the exact number of patients expected at the T.I. The maximum number that can be cared for is three.

1. Housekeeping - will bring the required number of beds, bedside stands and over-bed tables.
2. CSSD - will send the back-up supply carts and linen carts already prepared for 9NW to the T.I. They will also supply additional carts on daily basis as required. Portable suction machines will be provided as needed.
3. Pharmacy - will send stock medications to supply the area and will

provide regular delivery service to the T.I. They will also make prn deliveries as needed for stat medications and will send personnel in case of an emergency situation. Narcotics will be locked in one of the vacant personnel lockers in the area and will be secured by a lock supplied by pharmacy.

4. Dietary - will deliver meals as ordered on a regular basis to the area for these patients. They will also supply daily stock nourishments as required. These will be kept in the staff refrigerator in the lounge. Meals will be served on regular dishes and the nursing staff will transfer food to disposable dishes in the area to try and keep the food at the proper temperature.

5. Respiratory Therapy - will provide equipment and portable 02 as needed by the patients, and will provide daily service as required.

6. Radiation Department - will provide appropriate containers for waste.

As soon as possible, the 9NE charge nurse or head nurse will set up a staffing schedule for the Tumor Institute patients, based on anticipated patient care needs. These patients will be classified manually for determination of patient care needs according to Medicus. Staffing support will also come from 9NW and all of the other Medical units. Staffing will be based also on the recommendations established by the Radiation Safety Officer as to the amount of time each person can have direct contact with the patients.

E. ADMITTING DEPARTMENT

The director of admitting is notified by the switchboard of an EMERGENCY TYPE R and the causalities' ETA at the RCTF-ED.

The director of admitting shall determine the census on 9NE/Wallace and the location of available beds in the hospital.

The director of admitting and the administrator on duty shall determine the best available beds to transfer patients on 9NE/Wallace.

If the ETA of the casualties to the RCTF-ED is more than two hours, the director of admitting shall call the charge nurse on 9NE/Wallace and inform her of the availability of vacant beds.

If the ETA of the casualties to the RCTF-ED is less than two hours, the director of admitting shall call the charge nurse in the recovery room and inform her of the availability of vacant beds.

The director of admitting shall be notified by the appropriate charge nurse (9NE/Wallace or recovery room) of the location of the transferred patients.

F. OPERATING ROOM

After the casualty has been evaluated by the physicians in the RCTF-ED, and surgery is deemed necessary, the director of the RCTF shall notify the anesthesiologist on call and the person at the surgery desk to inform them of an EMERGENCY TYPE R and the casualty's ETA to OR.

The casualty requiring surgery shall be transported to emergency department personnel and available members of the radiation safety office via elevator #8 to the 7th floor operating room number 17 or 18, New Hillman (refer to Appendices 2, 2A).

All personnel entering the OR shall be required to wear two surgical gowns and one scrub suit in addition to shoe covers, double gloves, mask and cap. Pant legs of scrub suits shall be taped snugly around the ankle. Preparation of the OR room shall be accomplished as follows: All unnecessary equipment and supplies shall be removed before the casualty enters the room. After the casualty has entered the room, no instruments, equipment, specimens, personnel, etc., are to leave the room without being monitored by radiation safety office personnel. Equipment left in the room must be covered with a sheet. This includes the O.R. table which should be covered in a plastic sheet with steridrape adhered to its base.

One circulating nurse shall remain outside the operating room at all times to run errands and to provide personnel in the OR with supplies or equipment that might be needed from outside the OR.

After surgery, the casualty shall remain in the operating room until he is stable enough to be transported to 9NE/Wallace. The casualty shall not go to the recovery room.

When the casualty is stable enough to be transported to 9NE/Wallace, the radiation safety division personnel shall monitor the casualty and assist in decontamination procedures if necessary. Should the patient have respiratory contamination he will be masked.

The casualty shall be transferred to a clean stretcher at the door of the operating room and shall be transported to RCTF-9NE/Wallace by operating room personnel.

Before any personnel leave the operating room, they shall remove outer surgical gowns, shoe covers, gloves, masks and caps at the door exiting the operating room.

Radiation safety division personnel shall monitor each person as they leave the operating room.

All instruments, equipment, soiled linen, trash, etc., shall remain in the operating room to be bagged and/or monitored or decontaminated by radiation safety division personnel.

The door to the operating room shall be closed and the room placed "off limits" until deemed by the radiation safety division personnel safe to re-enter.

Specimens will be placed in lead containers labeled "radioactive" and transported by radiation safety division personnel.

G. INFORMATION COORDINATOR

Upon notification by the switchboard of an EMERGENCY TYPE R and the casualties' ETA at the RCTF-ED, the information coordinator shall notify the staff needed to maintain:

A waiting room for relatives and friends in the Spain Wallace lobby.

A room for media representatives, social services and chaplains in Conference Room A.

A telephone (934-4322) at the University Hospital patient information desk to respond to inquiries regarding the radiation casualties.

The information coordinator shall deal with media representatives and, upon consultation with the radiation safety office, shall release patient information. The administrator's office shall coordinate hospital staff resources in meeting the needs of the casualties; relatives and friends.

H. POLICE DEPARTMENT

The officer in charge is informed by the switchboard of an EMERGENCY TYPE R and the casualties' ETA at the RCTF-ED.

The officer in charge shall dispatch five officers with hand held radios for two-way communications to the following locations:

1. One officer shall be posted at the 6th Avenue South rear entrance to the RCTF-ED to secure the entrance and to ensure no unauthorized personnel or vehicles enter or depart prior to or after the arrival of the casualties.

2. One officer shall be posted on the 2nd Floor North Wing stairwell leading down to the decontamination area of the RCTF-ED to make sure no unauthorized personnel enter the area.

3. One officer shall be posted between the emergency department and the decontamination area of the RCTF-ED to prevent unauthorized personnel from entering.

4. One officer shall be posted between the emergency department and elevator #8 to assist radiation safety office personnel in clearing routes to the O.R. or 9NE/Wallace, and to perform additional tasks as necessary. This officer shall obtain the elevator key for elevator #8 from the UED charge nurse and lock out elevator #8 for UED use.

5. One officer shall be assigned to the 9NE/Wallace. The police department shall assign officers as needed and control and coordinate the assignments of those officers requested to respond to the EMERGENCY TYPE R.

All entrances and exits to and from Service Court #1 shall be marked by UAB PD personnel in an effort to prevent unauthorized entrance and unnecessary contamination of nonessential personnel.

I. ENVIRONMENTAL SERVICES

The director of environmental services is notified by the switchboard of an EMERGENCY TYPE R and the casualties' ETA at the RCTF-ED.

The director of environmental services shall designate a member of his staff to lock out Elevator #8 in J.T. and Elevator #5 in Spain Wallace, and shall send the necessary number of aides to 9NE/Wallace and the emergency room.

NOTE: Specific procedures will be outlined within the department for both the management staff and the employees.

UPDATING THE RCTF PLAN

The RCTF plan will be updated annually in December by the planning department. Revisions to the plan shall reflect such changes in call lists, equipment, supplies, and departmental procedures as may have occurred during the year.

All revisions to the plan are subject to review and approval by Hospital Administration, the Chief of Staff, and appropriate authorities of the Alabama Power Company and the Disaster Committee.

It shall be the responsibility of the radiation safety office to check all supplies and equipment stored in the radiation safety office and the emergency department annex on a regular basis. Inspections of supplies and equipment shall be documented and kept on file in the radiation safety office.

EMERGENCY PREPAREDNESS

EMERGENCY PREPAREDNESS

Each department or unit responding to an EMERGENCY TYPE R shall be responsible for reviewing the emergency radiation plan with the appropriate staff every six months. These departments or units shall also be responsible of participating in a drill at least once a year.

Departmental orientation of new employees shall include a review of the entire plan with emphasis on their particular department or unit. As appropriate, key medical personnel shall attend various radiation accident safety seminars.

A drill shall be held at least once a year with Alabama Power Company personnel in attendance, if possible. The Alabama Power Company may conduct critique sessions and seminars for new employees. The drills should be scheduled jointly by the radiation safety officer and the director of emergency department in corporation with hospital administration.

Equipment and supply inventories, will be checked at least every six months with records of these checks and inventories to be kept by the emergency department administrator.

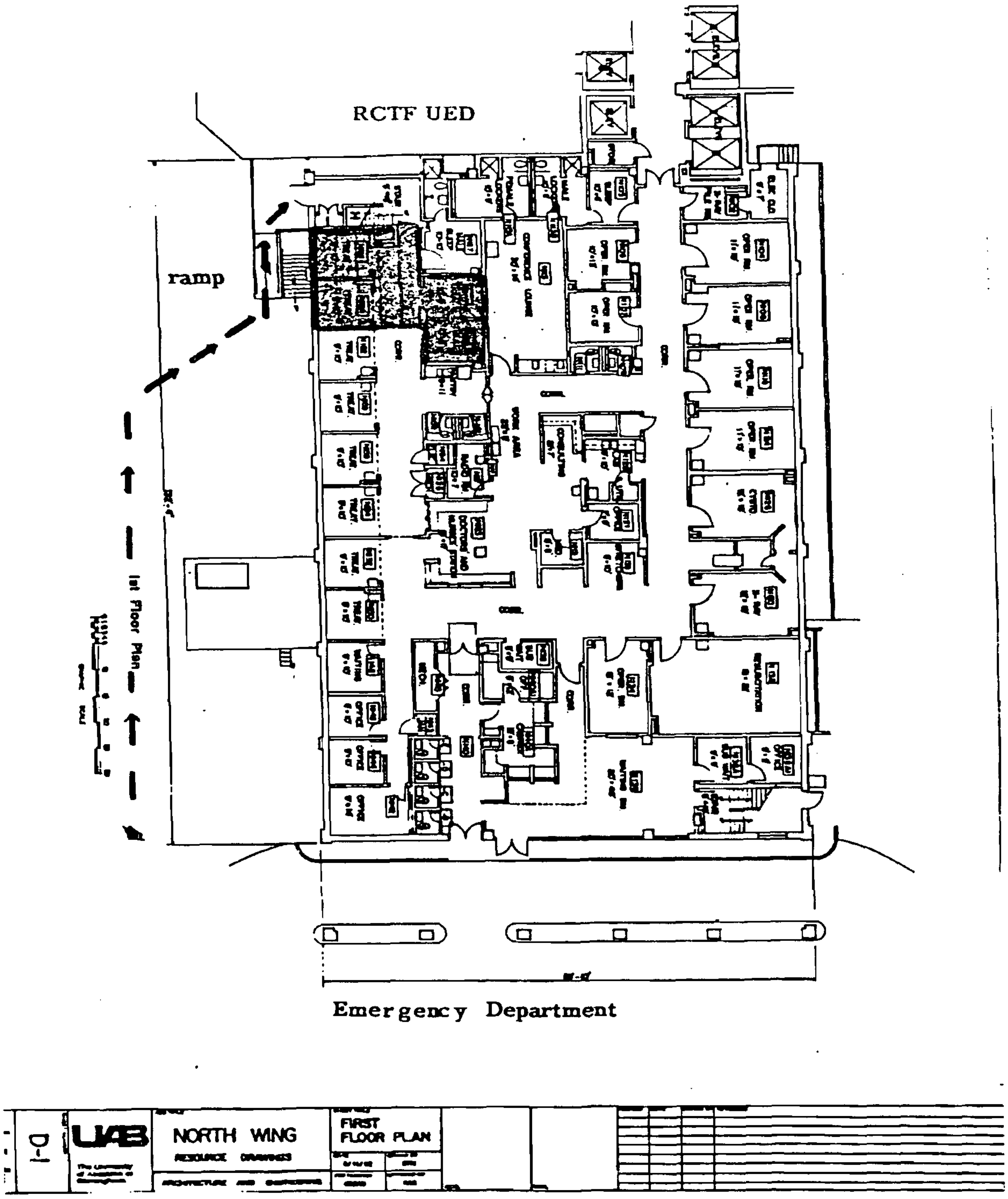
RADIATION DISASTER REFERENCE MATERIAL

"Hospital Preparation For the Management of Radiation Accidents" The E. L. Saenger Radioisotope laboratory, University of Cincinnati Medical Center, 1980 (161 pages)

"Radiation Accident Response Training Tape - Pre-Hospital Care and Hospital Care", The Alabama Health Physics Society, 1984 (Videocassette 1/2")

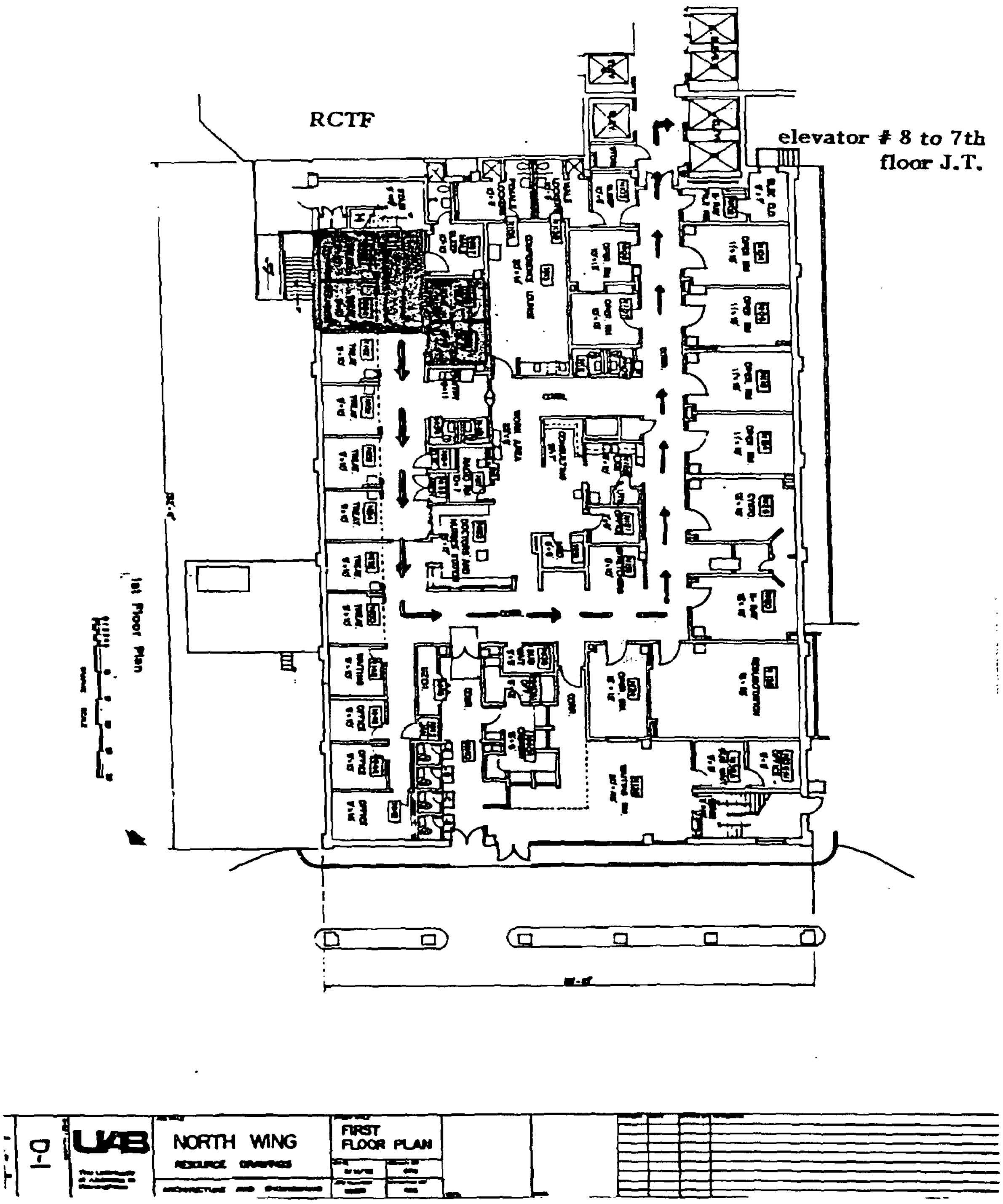
"Hospital Emergency Department Response to Radiation Accidents:, Oak Ridge Associated University (Videocassette 3/4" 20 Min) 1984

Publication Number OP 335 "A Guide to the Hospital Management of Injuries Arising From or Involving Ionizing Radiation", American Medical Association

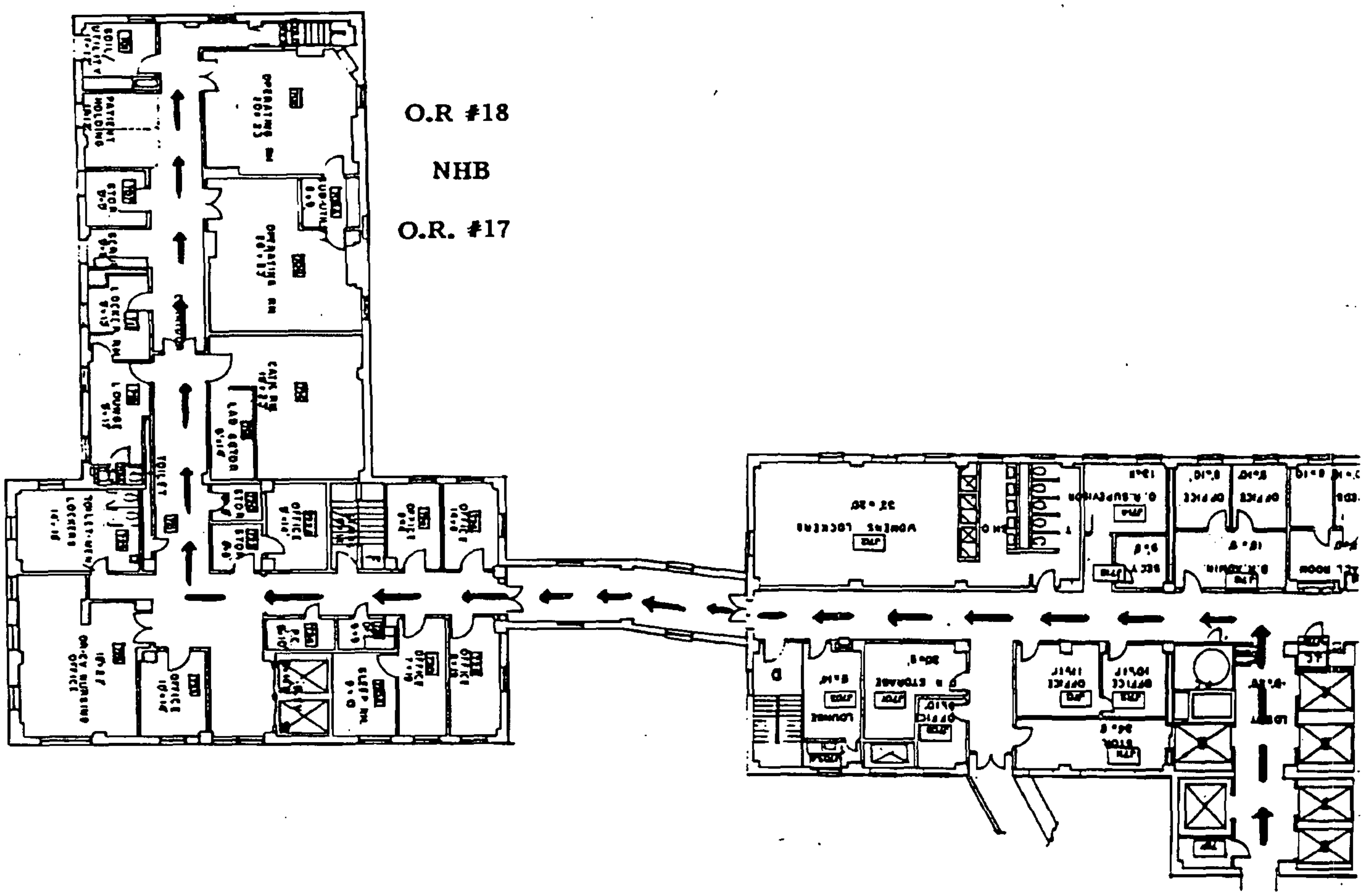

RCTF UED
ramp
1st Floor Plan
Emergency Department
NORTH WING
RESOURCE DRAWINGS
ARCHITECTURE AND ENGINEERING
FIRST FLOOR PLAN
D-1

APPENDIX 2

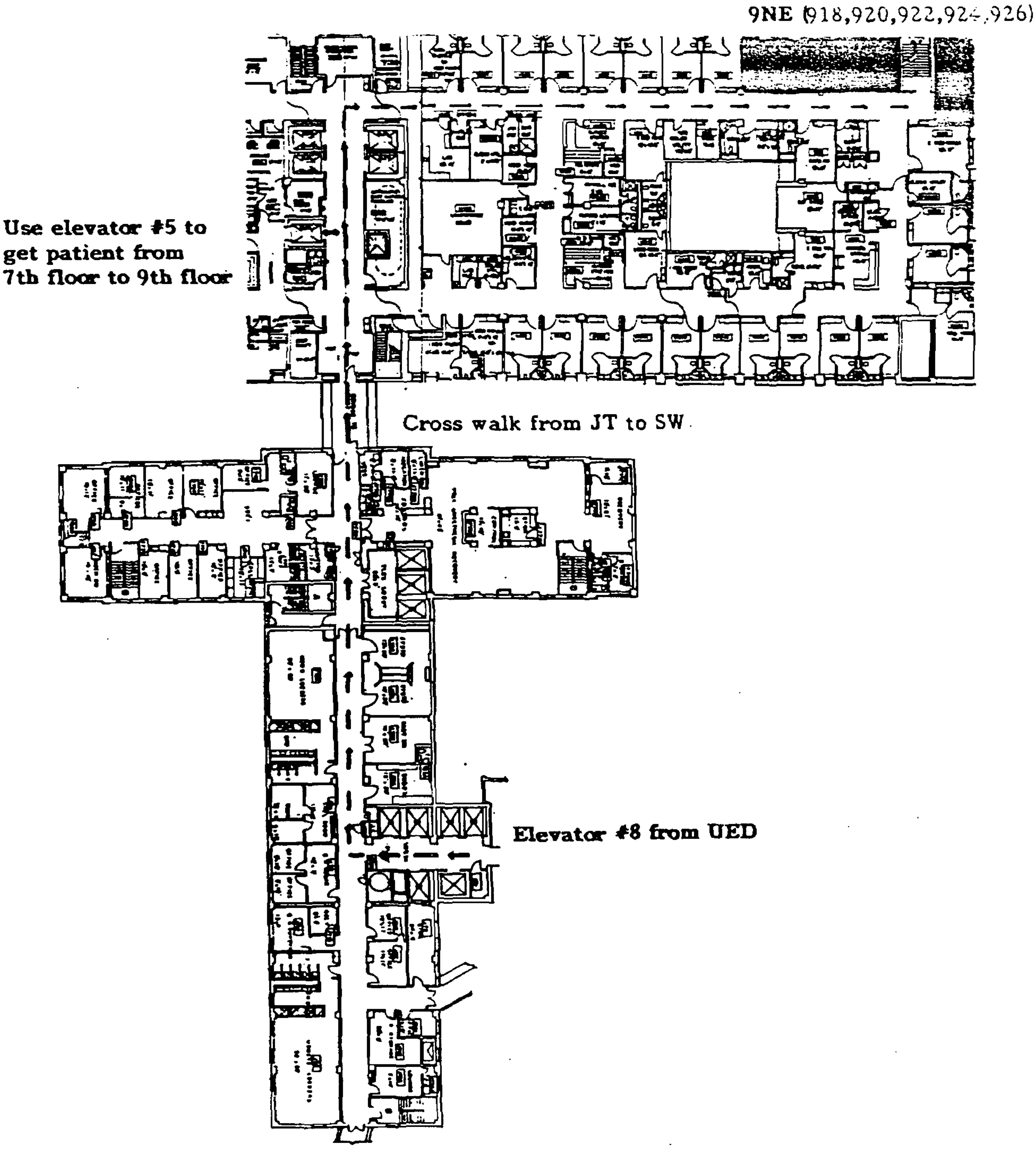
(Patient transport route from RTCF to O.R.)



APPENDIX 2a
(Patient transport route from RTCF to O.R.)

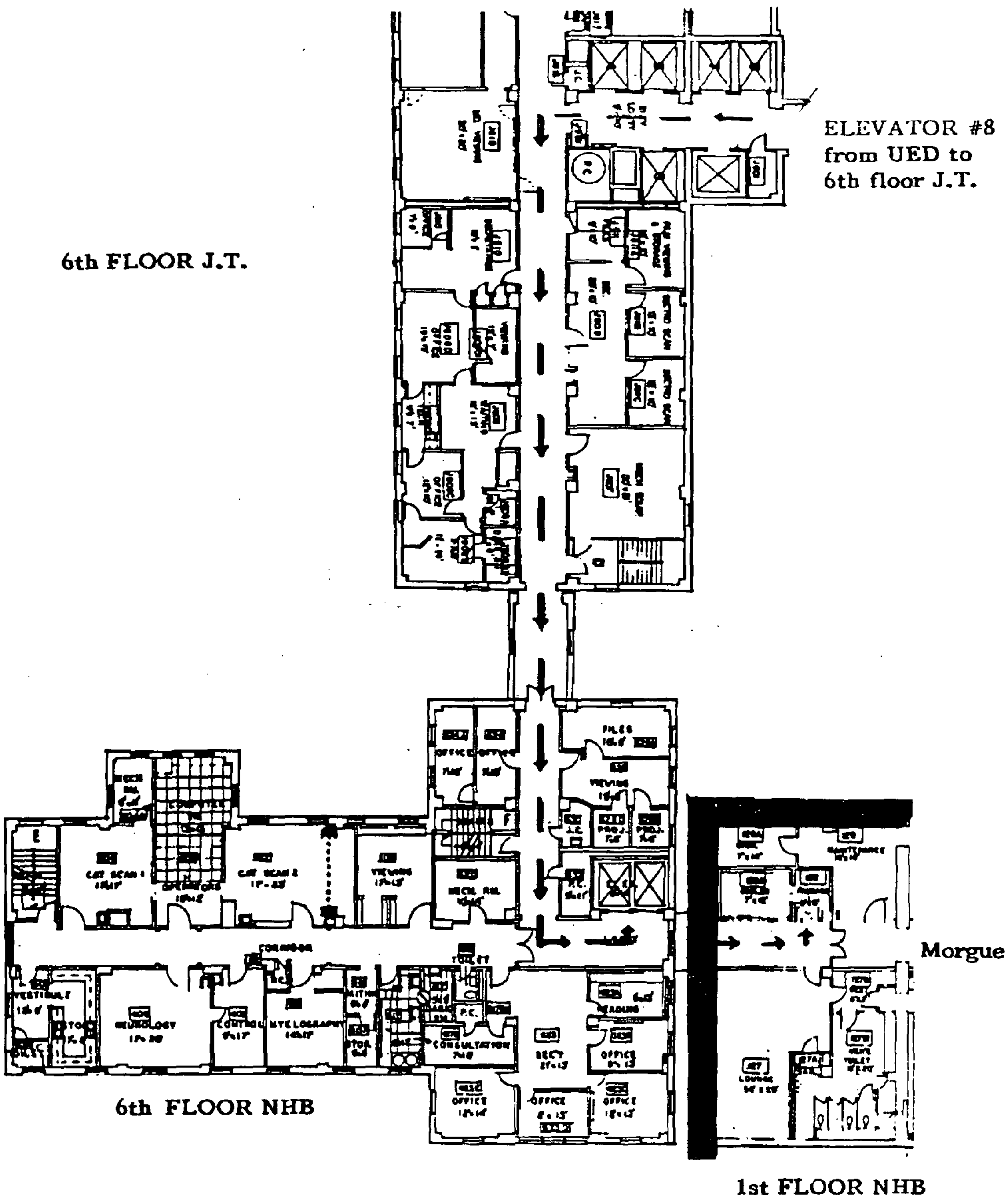


APPENDIX 3
(Patient transportation route from RTCF
to **9NE** via 7th floor J.T.)

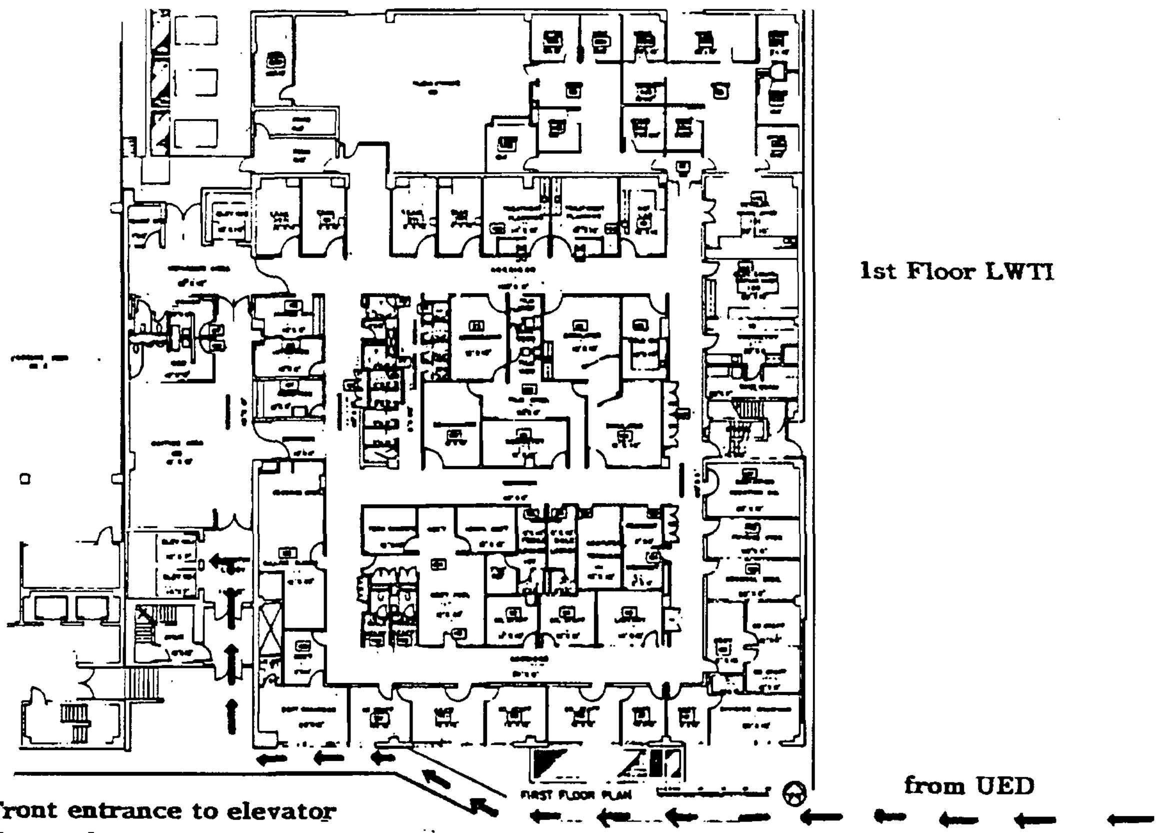


APPENDIX 4

(Casualty transport route from RTCF to Morgue)



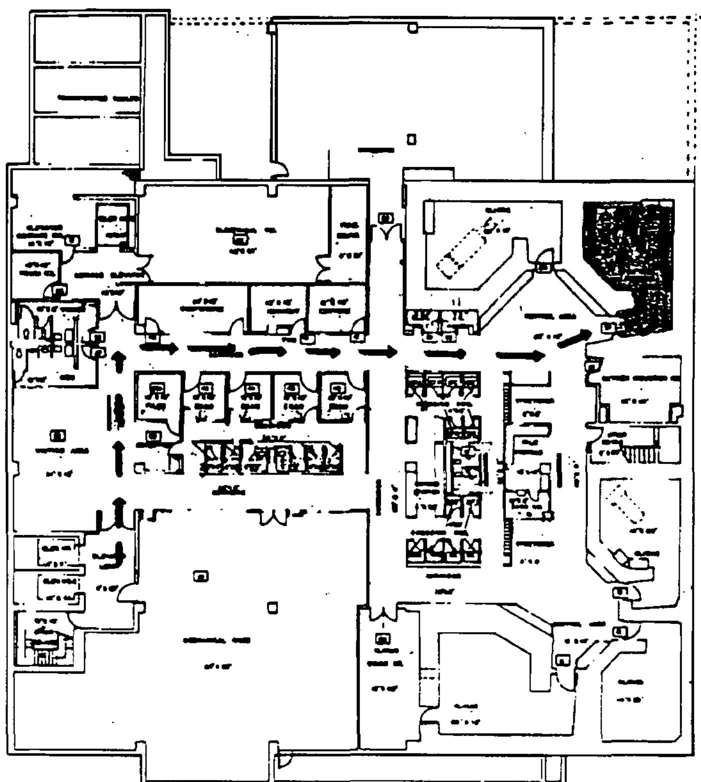
APPENDIX 5
(Patient transport route from UED to
Laurleen Wallace Tumor Institute)



1st Floor LWTI

from UED

Front entrance to elevator then to basement



Basement LWTI to Room TO21

ORAU Medical Division Hospital: Daytime (615) 483-8411
Extension 215

Night (615) 483-6351

1. Hospital Facilities & Equipment

a. The Medical Division has facilities for accommodating approximately 20 patients who are contaminated or have received high doses of external radiation. A laminar flow facility with two sterile rooms is available for patients requiring isolation. The hospital has whole-body counters capable of evaluating internal contamination ranging from 1 nanocurie to 150 millicuries. Linear, area, and total-body scanners, as well as an Anger Camera, can be used for scanning studies. Probes are available for locating radioactive particles in wounds. The hospital also is equipped with physiological monitoring equipment on a computer hookup for automatically evaluating respiratory and cardiac changes.

b. A suitable area for performing decontamination can be provided. Disposal of both liquid and solid radioactive wastes can be handle Shields and remote handling equipment are available for the protection of staff and visitors from high radiation levels if the patient is highly contaminated or radioactive.

2. Medical and Technical Staff

a. The Medical Division staff of about ten physicians has considerable experience in total-body irradiation. Several have participated in the handling of previous radiation accidents. Experience in treatment procedures such as bone marrow transplants and platelet and white cell transfusions is also represented by this staff. In addition to the physicians on the ORAU staff, other specialists from Oak Ridge Hospital of the Methodist Church, hospitals in Knoxville, and the Health Physics Division and the Biology Division of Oak Ridge National Laboratory are available for consultation and assistance.

b. Nursing Staff

Nurses, nurses' aides, and orderlies provide patient care. Like the physicians at the Medical Division, the staff is experienced in handling patients who have been treated with or accidentally exposed to both external and internal radiation.

c. Auxiliary Services

Support services available at the Medical Division Hospital include bacteriology, cytogenetics, clinical chemistry, hematology, radiology, scanning, whole-body counding, radiation dosimetry, and pathology.

3. Health Physics Services

a. The health physicists at ORAU are certified by the American Board of Health Physics. These health physicists and their technical staff have several years of experience with patients who have received radiation exposures in varying amounts.

b. Equipment includes a variety of frequently calibrated survey instruments, air sampling equipment, personnel, and area monitoring devices, counting equipment for alpha, low-energy beta, beta-gamma, and gamma radiation, and a multichannel analyzer. Additional equipment is also available from other ORAU divisions.

c. In addition to the ORAU health physics staff, ORNL and AEC/ORO health physicists are also available for consultation and assistance. The protection of ORAU personnel and facilities will be the responsibility of the ORAU Radiation and Chemical Safety Office, and operations will be performed in accordance with the requirements of the ORAU Radiation Safety Manual.

APPENDIX F

ROSTER OF MEDICAL CONSULTANTS

I. SOUTHERN NUCLEAR MEDICAL DIRECTOR

C. Calvert Dodson, III, M.D.

II. SNC CONTRACT PHYSICIANS (FAIRVIEW CLINIC, DOTHAN)

Earl F. Mazyck, M.D.
James A. Robeson, Jr. M.D.
J. Ryan Conner, M.D.
Christopher L. Miller, M.D.

III. SAMC STAFF

James C. Jones, D.O., Director, Emergency Room

IV. UNIVERSITY OF ALABAMA MEDICAL CENTER STAFF

Chris Roskoe, M.D., Medical Director, Emergency Room