



# **Final Exercise Report**

## **Vogtle Electric Generating Plant**

**Licensee: Southern Nuclear Operating Company**

**Exercise Date: March 29, 2000**

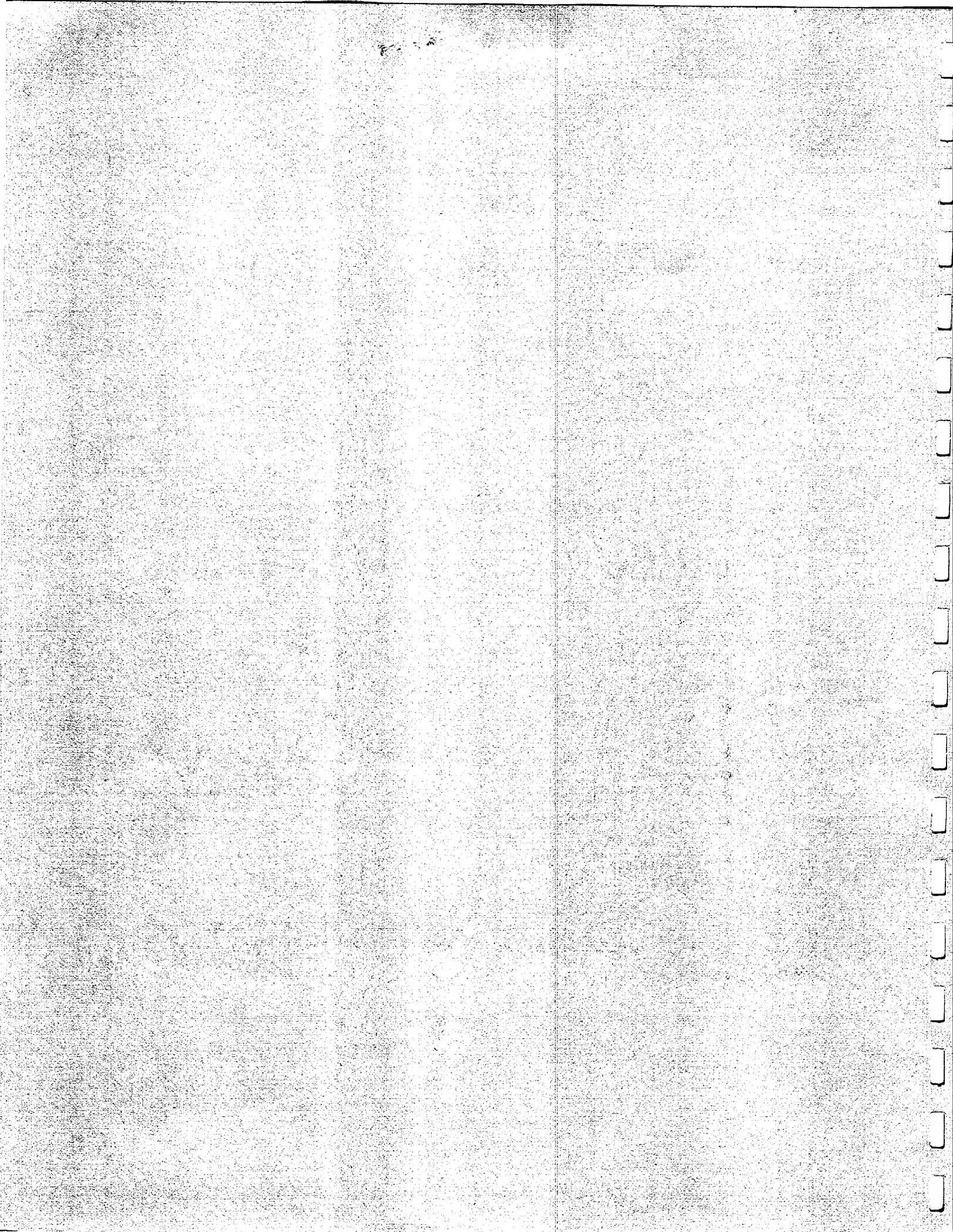
**Report Date: June 16, 2000**

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**FEDERAL EMERGENCY MANAGEMENT AGENCY  
REGION IV**

**3003 Chamblee Tucker Road  
Atlanta, Georgia 30341**

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# Federal Emergency Management Agency

Region IV  
3003 Chamblee-Tucker Rd  
Atlanta, GA 30341

June 16, 2000

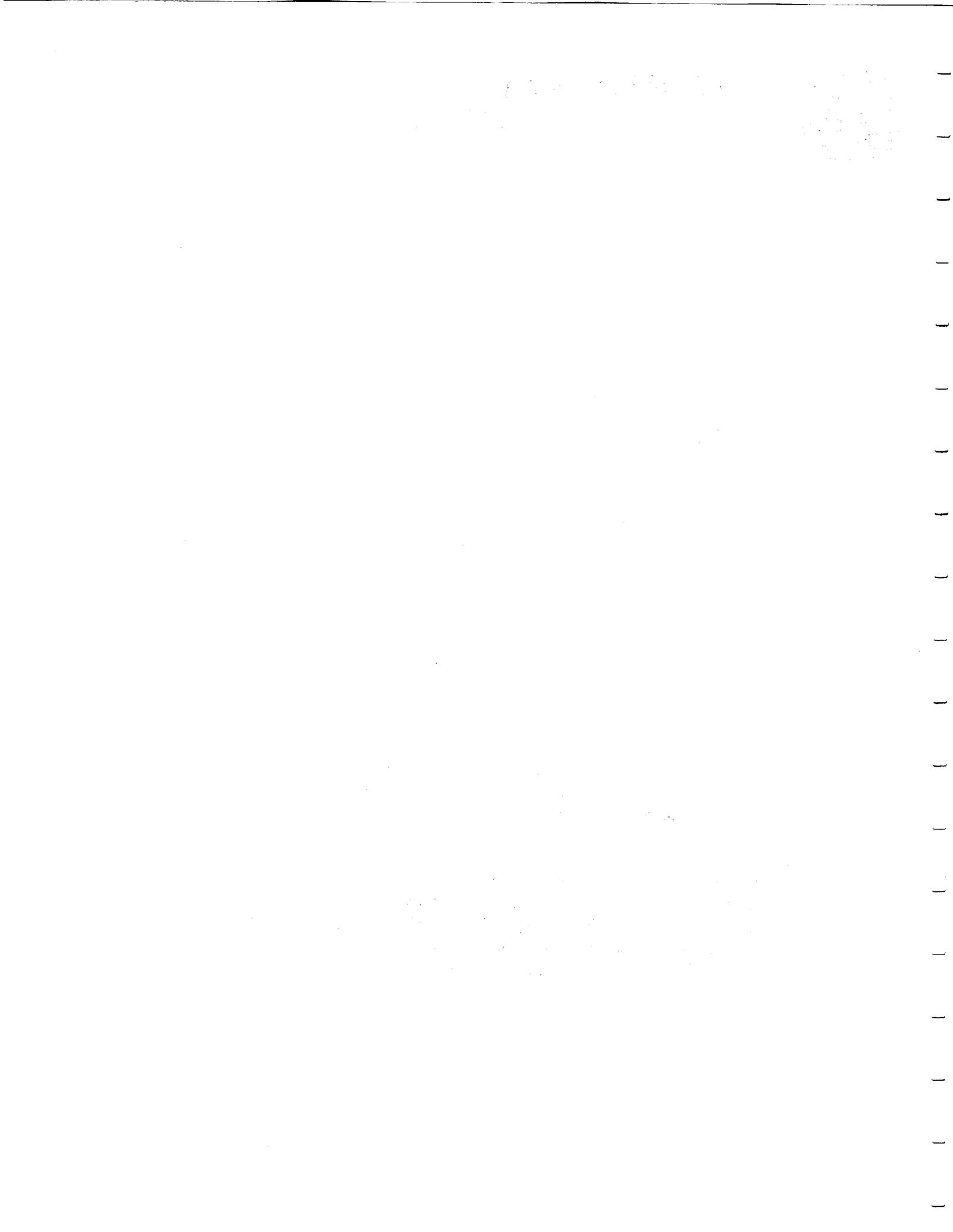
Mr. Luis A. Reyes  
Regional Administrator - RII  
Nuclear Regulatory Commission  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303

Dear Mr. <sup>Luis</sup>Reyes:

Enclosed is a copy of the final exercise report for the March 29, 2000, plume exposure pathway exercise of the offsite radiological emergency response plans site-specific to the Vogtle Electric Generating Plant. This report addresses the evaluation of the plans and preparedness for the States of Georgia and South Carolina and Burke County, Georgia, and the South Carolina Counties of Aiken, Allendale and Barnwell that are located within the 10-mile EPZ. Parts of DOE's Savannah River Site (SRS) are also within the 10-mile EPZ and DOE has the responsibility for emergency response actions on SRS. The final exercise report was prepared by the Federal Emergency Management Agency Region IV staff. Copies of this report will be forwarded to the States of Georgia and South Carolina, FEMA Headquarters, and NRC Headquarters by my staff.

All objectives of the exercise were demonstrated. No Deficiencies or Areas Requiring Corrective Action (ARCA) were identified during this exercise. Seven ARCAs identified during the June 24, 1998 Vogtle exercise, and one ARCA identified during the December 7, 1999 H. B. Robinson exercise were corrected during this exercise.

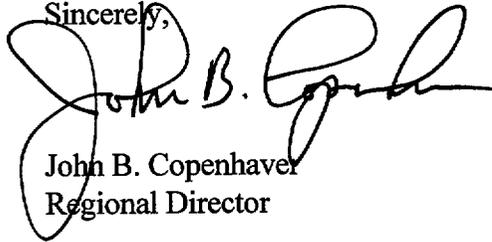
Based on the results of the March 29, 2000, exercise, and FEMA's review of Georgia's and South Carolina's Annual Letters of Certification for 1998 and 1999, the offsite radiological emergency response plans and preparedness for the States of Georgia and South Carolina and the affected local jurisdictions site-specific to the Vogtle Electric Generating Plant can be implemented and are adequate to provide reasonable assurance that appropriate measures can be taken offsite to protect the health and safety of the public in the event of a



radiological emergency at the site. The Title 44 CFR, Part 350, approval of the offsite radiological emergency response plans and preparedness for the States of Georgia and South Carolina site-specific to Vogtle Electric Generating Plant granted for both States on June 9, 1987, will remain in effect.

Should you have questions, please contact Donald L. Cornell at 770/220-5470.

Sincerely,

A handwritten signature in black ink, appearing to read "John B. Copenhaver". The signature is fluid and cursive, with the first name "John" being the most prominent.

John B. Copenhaver  
Regional Director

Enclosure

cc: Ms. Vanessa E. Quinn, Acting Chief  
FEMA HQ, State and Regulatory Evaluation  
Assessment Branch - PT-CR-RP

Acting Chief,  
Emergency Preparedness and Health Physics Section  
Operator Licensing, Human Performance and Plant Support Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555-0001





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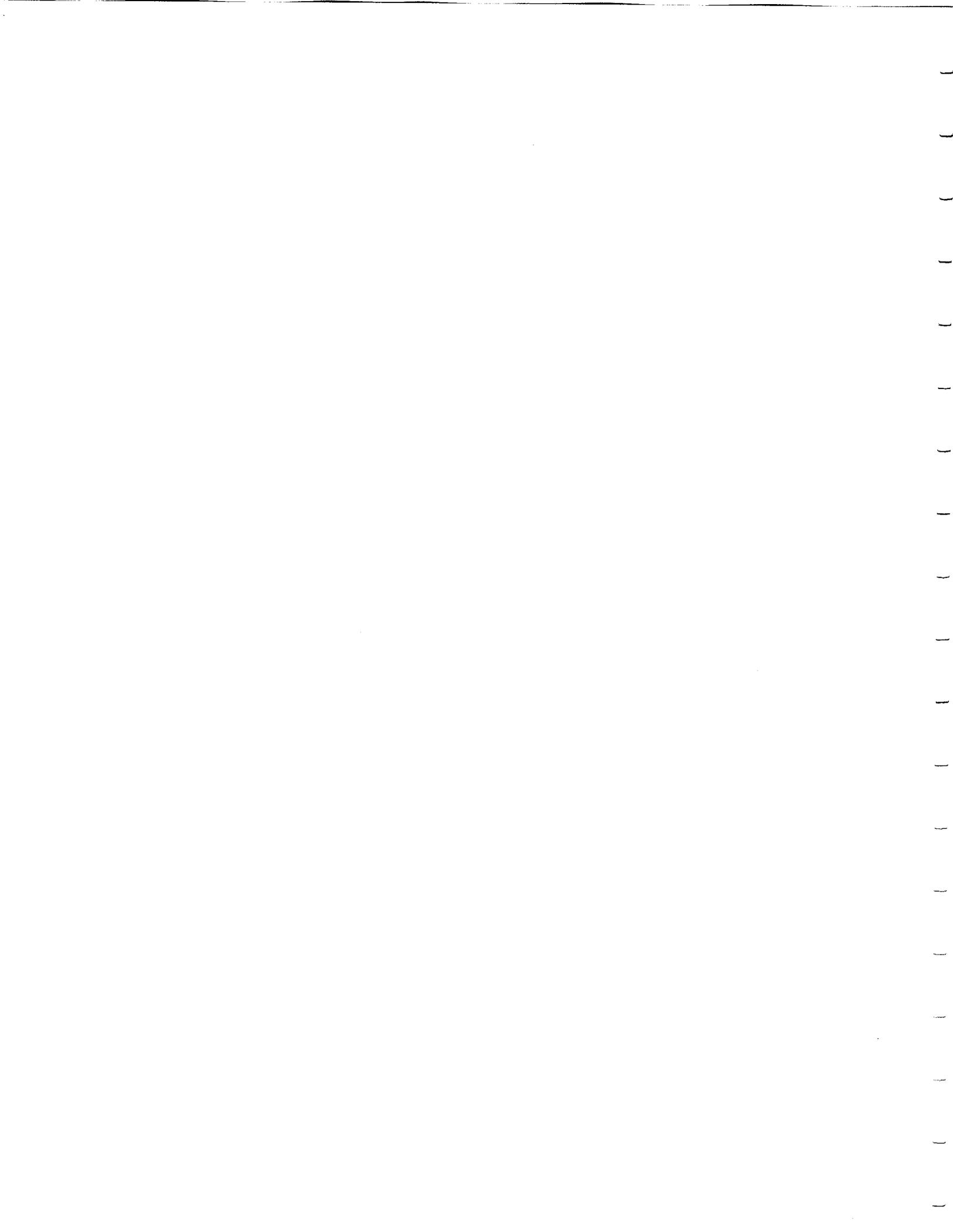
**Exercise Date: March 29, 2000**

**Report Date: June 16, 2000**

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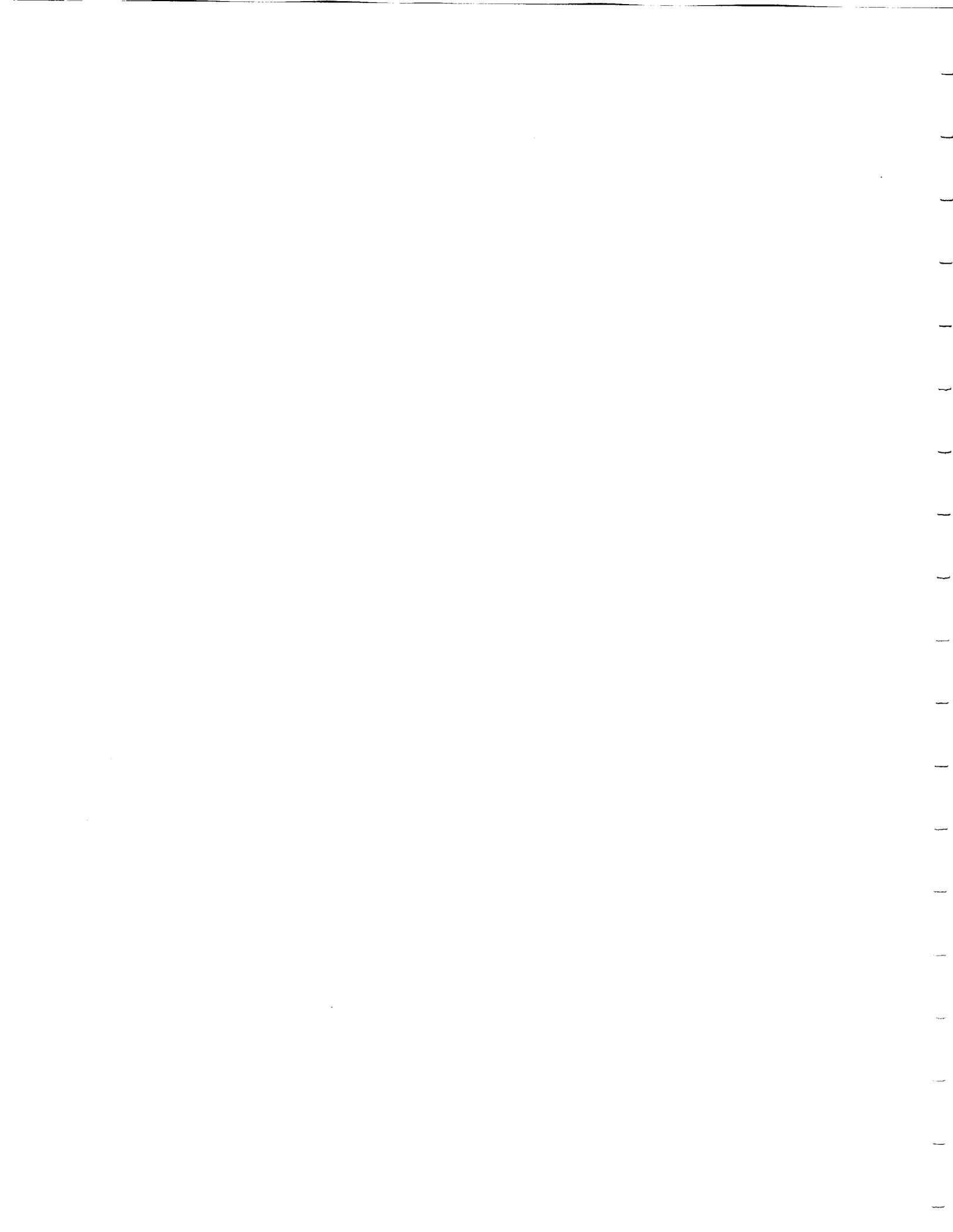
**FEDERAL EMERGENCY MANAGEMENT AGENCY**  
**REGION IV**  
**3003 Chamblee Tucker Road**  
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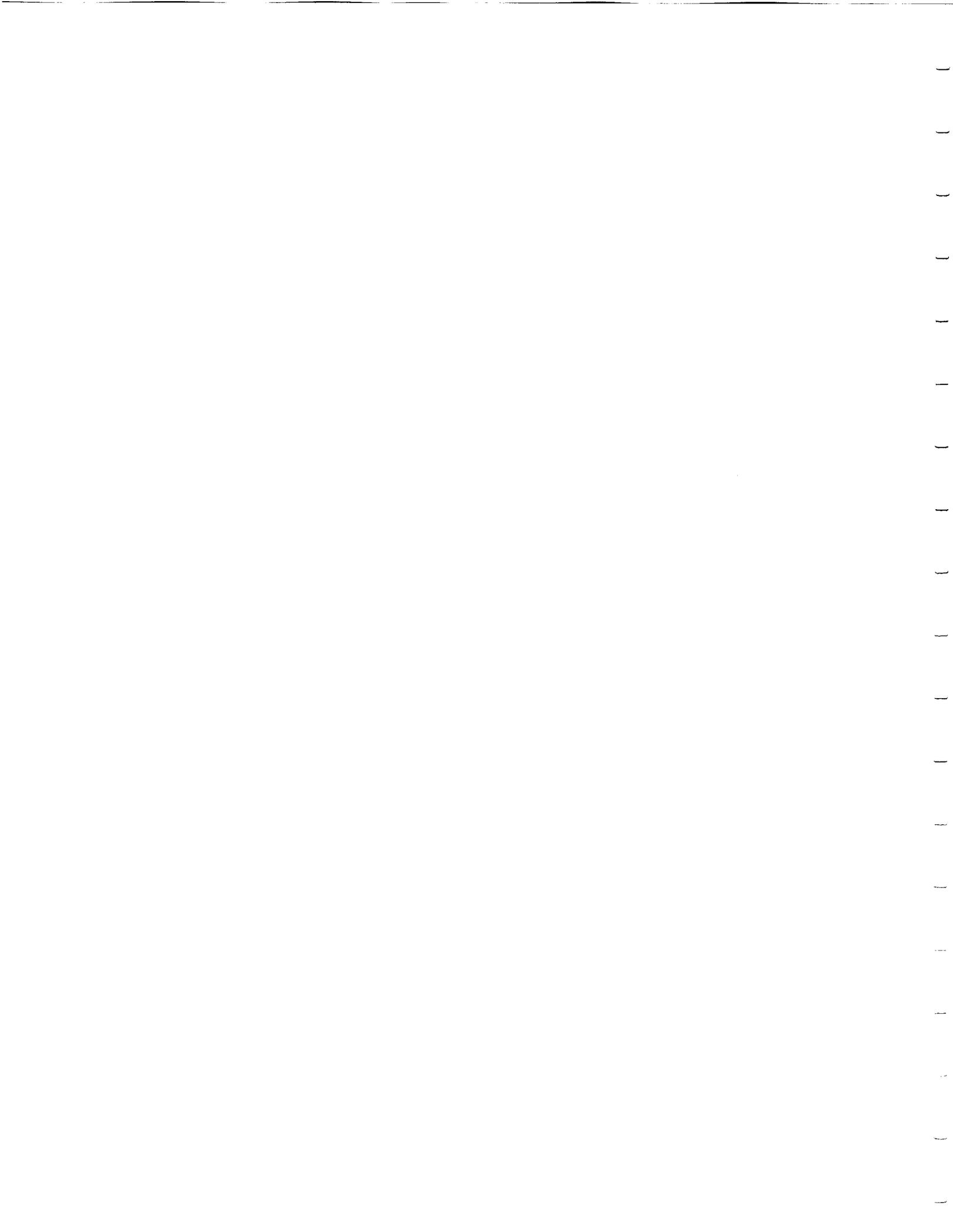
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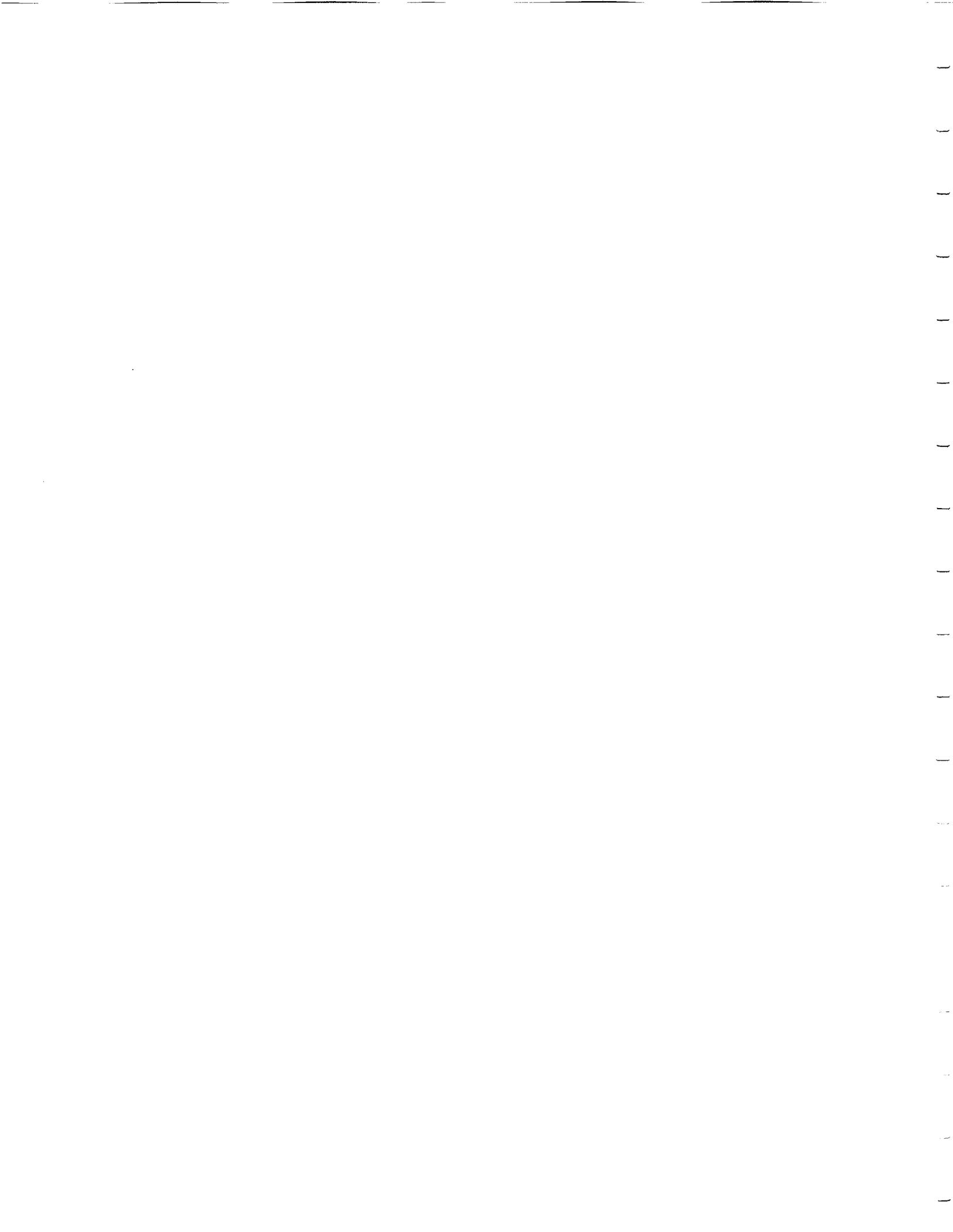
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## **I. EXECUTIVE SUMMARY**

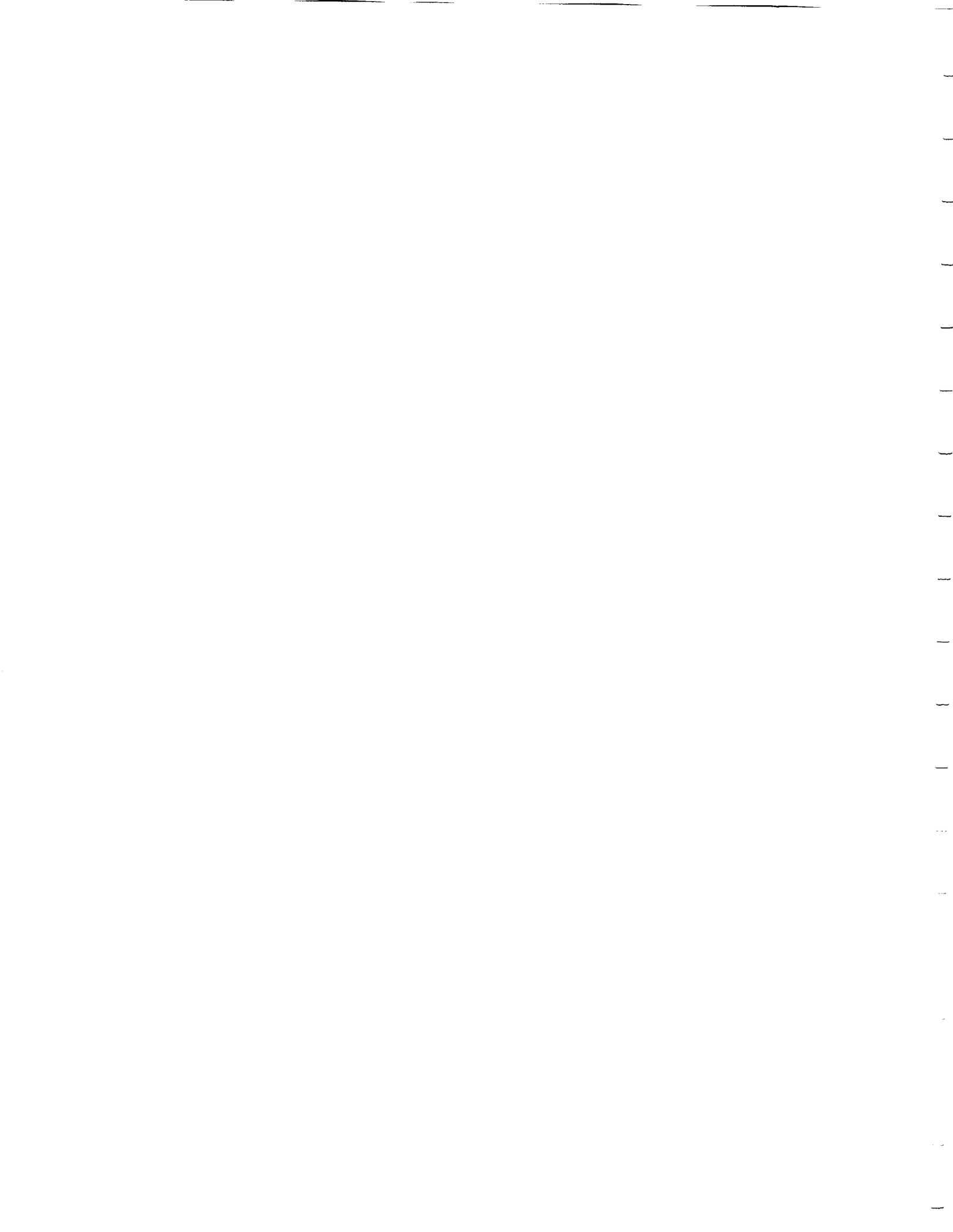
On March 29, 2000, an exercise was conducted in the plume exposure pathway emergency planning zone (EPZ) around the Vogtle Electric Generating Plant. The purpose of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency. This exercise was held in accordance with the Federal Emergency Management Agency's (FEMA) policies and guidance concerning the exercise of State and local radiological emergency response plans (RERP) and procedures.

The previous exercise at this site was conducted on June 24, 1998. The qualifying emergency preparedness exercise was conducted on April 30 - May 1, 1986.

FEMA wishes to acknowledge the efforts of the many individuals in the States of Georgia and South Carolina, Burke County in Georgia, and Aiken, Allendale, and Barnwell Counties in South Carolina, and Department of Energy, Savannah River Site, who participated in this exercise. A special thanks to the emergency alert system (EAS) radio station, WBBQ for its participation in this exercise.

Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still others have willingly sought this responsibility by volunteering to provide vital emergency services to their communities. Cooperation and teamwork of all the participants were evident during this exercise.

State and local organizations, except where noted in this report, demonstrated knowledge of their emergency response plans and procedures and satisfactorily implemented them. No deficiencies or areas requiring corrective action (ARCAs) were identified. Seven ARCAs identified during the June 24, 1998, Vogtle exercise, and one ARCA identified during the December 7, 1999, H. B. Robinson exercise were corrected during this exercise.



## II. INTRODUCTION

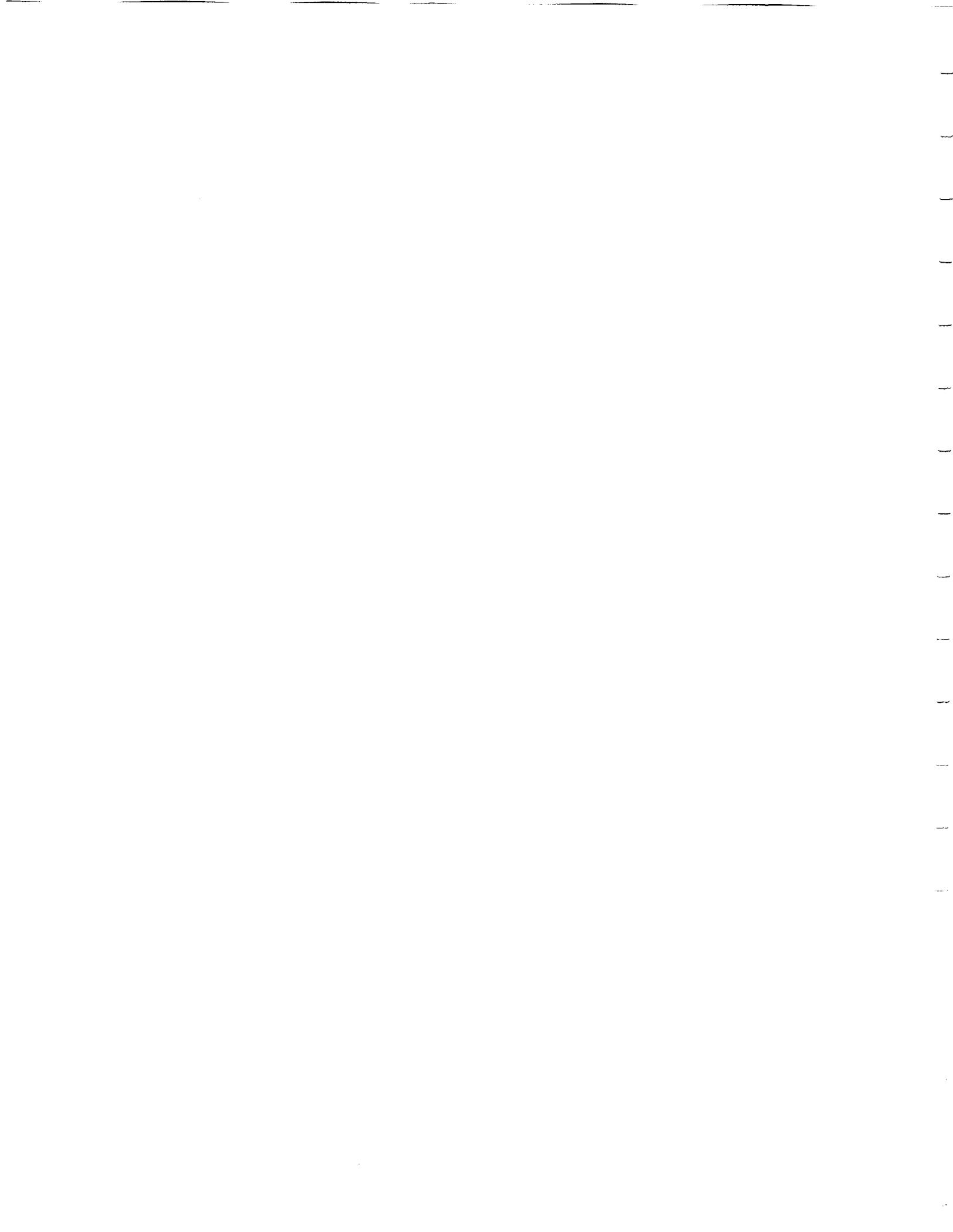
On December 7, 1979, the President directed FEMA to assume the lead responsibility for all offsite nuclear planning and response. FEMA's activities are conducted pursuant to 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

FEMA Rule 44 CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of State and local governments' radiological emergency planning and preparedness for commercial nuclear power plants. This approval is contingent, in part, on State and local government participation in joint exercises with licensees.

FEMA's responsibilities in radiological emergency planning for fixed nuclear facilities include the following:

- Taking the lead in offsite emergency planning and in the review and evaluation of radiological emergency response plans and procedures developed by State and local governments;
- Determining whether such plans and procedures can be implemented on the basis of observation and evaluation of exercises of the plans and procedures conducted by State and local governments;
- Responding to requests by the Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (Federal Register, Vol. 58, No. 176, September 14, 1993).
- Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:
  - Department of Commerce,
  - Nuclear Regulatory Commission,
  - Environmental Protection Agency,
  - Department of Energy,
  - Department of Health and Human Services,
  - Department of Transportation,
  - Department of Agriculture,
  - Department of the Interior, and
  - Food and Drug Administration.

Representatives of these agencies serve on the FEMA Region IV Regional Assistance Committee (RAC) which is chaired by FEMA.



Formal submission of the RERPs for the Vogtle Electric Generating Plant to FEMA Region IV by the States of Georgia and South Carolina occurred respectively on September 24, 1986, and September 26, 1986. Formal approval of each State's RERP was granted by FEMA on June 9, 1987, under 44 CFR 350.

The REP exercise conducted on March 29, 2000, by FEMA Region IV was to assess the capabilities of State and local emergency preparedness organizations in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving the Vogtle Electric Generating Plant. The purpose of this exercise report is to present the results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

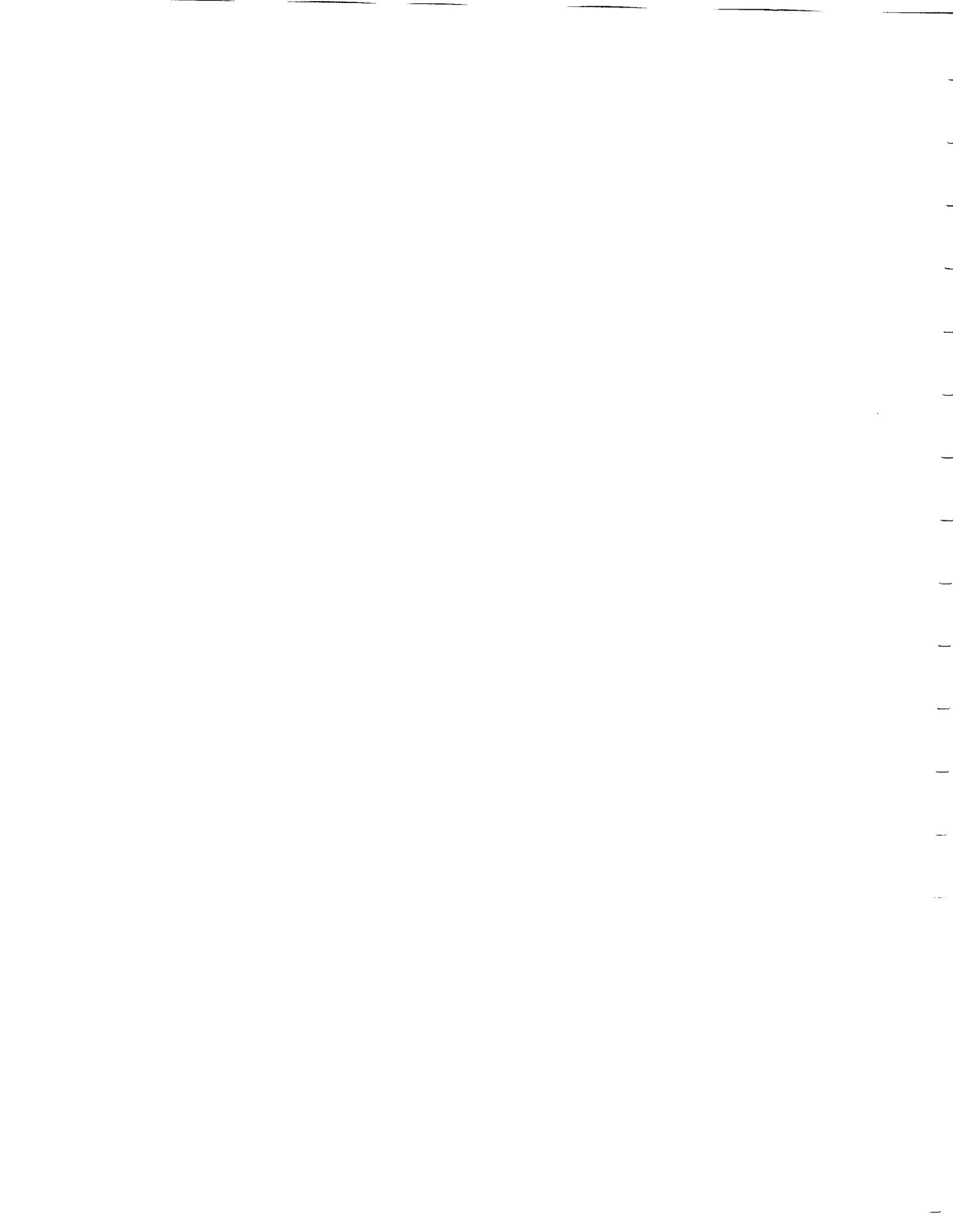
The findings presented are based on evaluations by the federal evaluator team, with final determinations made by the Chief Evaluator and RAC Chairperson, and approved by the Regional Director.

The criteria for evaluations are contained 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," November 1980;
- FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991; and
- FEMA-REP-15, "Radiological Emergency Preparedness Exercise Evaluation Methodology," September 1991.

Section III of this report, entitled "Exercise Overview," presents basic information and data relevant to the exercise. This section of the report contains a description of the plume pathway EPZ, a listing of all participating jurisdictions and functional entities which were evaluated, and a tabular presentation of the time of actual occurrence of key exercise events and activities.

Section IV of this report, entitled "Exercise Evaluation and Results," presents detailed information on the demonstration of applicable exercise objectives at each jurisdiction or functional entity evaluated in a jurisdiction-based, issues-only format. This section also contains: (1) descriptions of all Deficiencies and ARCAs assessed during this exercise, recommended corrective actions, and the State and local governments' schedule of corrective actions for each identified exercise issue and (2) descriptions of ARCAs assessed during previous exercises and the status of the OROs efforts to resolve them.



### **III. EXERCISE OVERVIEW**

Contained in this section are data and basic information relevant to the March 29, 2000, exercise to test the offsite emergency response capabilities in the area surrounding the Vogtle Electric Generating Plant.

#### **A. Plume EPZ Description**

The Vogtle Electric Generating Plant is located on the Savannah River in the eastern portion of Burke County, Georgia, approximately 26 miles southeast of Augusta, Georgia. The Vogtle Electric Generating Plant is operated by the Southern Nuclear Operating Company. Units 1 and 2 became operational in 1987 and 1989 respectively. The facility utilizes two pressurized water reactors manufactured by the Westinghouse Electric Corporation with a total production capacity of 2,320 megawatts.

Portions of Burke County in Georgia and Aiken, Allendale and Barnwell Counties in South Carolina lie within the 10-mile plume exposure pathway EPZ that surrounds Vogtle Electric Generating Plant. The major portion of the 10-mile EPZ in South Carolina encompasses the Department of Energy's Savannah River Site (SRS). DOE-SRS, pursuant to a memorandum of agreement, will be responsible for all emergency response actions on SRS whenever an emergency occurs at Vogtle Electric Generating Plant. Other land use is rural and recreational. There are no schools, railways or airports within the EPZ. The population of the EPZ is 2,609 in Georgia and 37 in South Carolina.

#### **B. Exercise Participants**

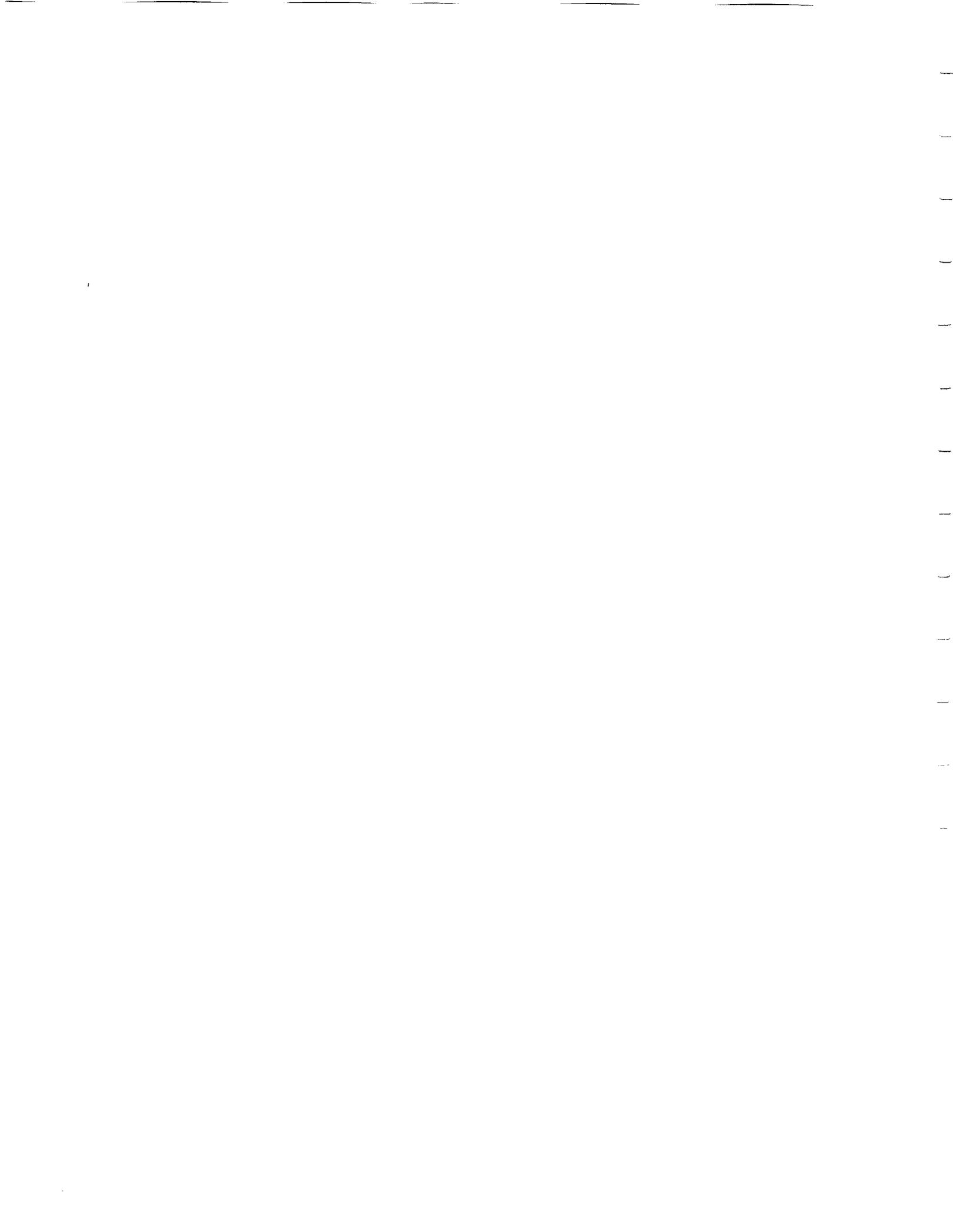
The following agencies, organizations, and units of government participated in the Vogtle Electric Generating Plant exercise on March 29, 2000.

##### **STATE OF GEORGIA**

Office of the Governor  
Georgia Emergency Management Agency  
Department of Natural Resources  
Department of Transportation

##### **RISK JURISDICTION**

Burke County



**STATE OF SOUTH CAROLINA**

Office of the Adjutant General  
Emergency Preparedness Division  
Department of Health & Environmental Control  
Bureau of Solid and Hazardous Waste Management  
Department of Social Services

**RISK JURISDICTIONS**

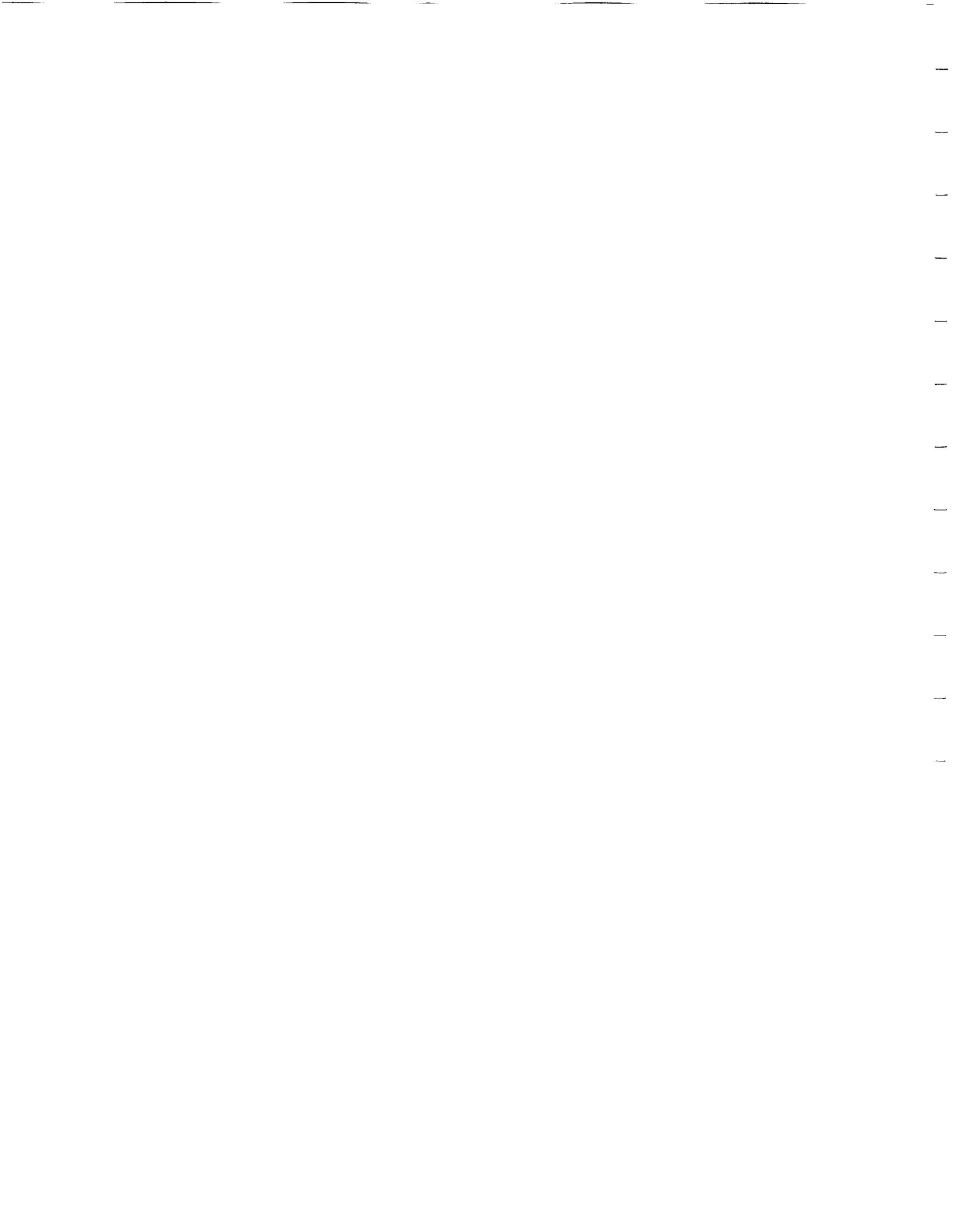
Aiken County  
Allendale County  
Barnwell County

**PRIVATE/VOLUNTEER ORGANIZATIONS**

Chem-Nuclear Systems, Inc.  
American Red Cross  
The Salvation Army  
Radio Amateur Civil Emergency Service

**C. Exercise Timeline**

Table 1, on the following page, presents the time at which key events and activities occurred during the Vogtle Electric Generating Plant exercise on March 29, 2000. Also included are times that notifications were made to the participating jurisdictions/functional entities.



**Table 1. Exercise Timeline**

**DATE AND SITE: March 29, 2000 Vogtle Electric Generating Plant**

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received or Action Was Taken						
		GA - FEOC	ENC	Burke County	SC - FEOC	Aiken County	Allendale County	Barnwell County
Alert	0924	0936	0939	0940	0935	0935	0940	0935
Site Area Emergency	1053	1058	1057	1117	1105	1105	1105	1105
General Emergency	1206	1221	1215	1225	1220	1219	1219	1219
Simulated Rad. Release Started	0924	0924		0924	0935	0935	0940	0935
Simulated Rad. Release Terminated	1308							
Facility Declared Operational		1043	0941	0945	0945 - SEOC 1000-FEOC control	0945	0952	0930
Declaration of State of Emergency		1055	1100 - GA 1014 - SC	N/A	1014	1040	1020	1119
Exercise Terminated		1353	1317	1320	1330	1315	1305	1320
Early Precautionary Decision		1100 - River clearance		1000 - Contact special needs population 1028 - EAS activation; 1100 - River Clearance 1130 - Control access 10-mile EPZ; begin preparation of schools		1135 Prepare Reception and Congregate Care Center		
1 <sup>st</sup> Protective Action Decision Public Warning					1129	1129	1129	1129
1 <sup>st</sup> Siren Activation					1137	1137	1137	1137
1 <sup>st</sup> EAS Message					1137	1137	1137	1137
2 <sup>nd</sup> Protective Action Decision Evacuate: A, B5,C5,D5,E5,F5,B10,C10, D10,E10 & F10 Shelter: G10 & H10		1242		1242	1242	1242	1242	1242
2 <sup>nd</sup> Siren Activation/NOAA Tone Alert		1250		1250	1250	1250	1250	1250
2 <sup>nd</sup> EAS message/NOAA Tone Alert		1250		1250	1252	1252	1252	1252
KI Decision:		1129					1145 Distribute to emergency workers	1136 - Prepare to distribute

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## **IV. EXERCISE EVALUATION AND RESULTS**

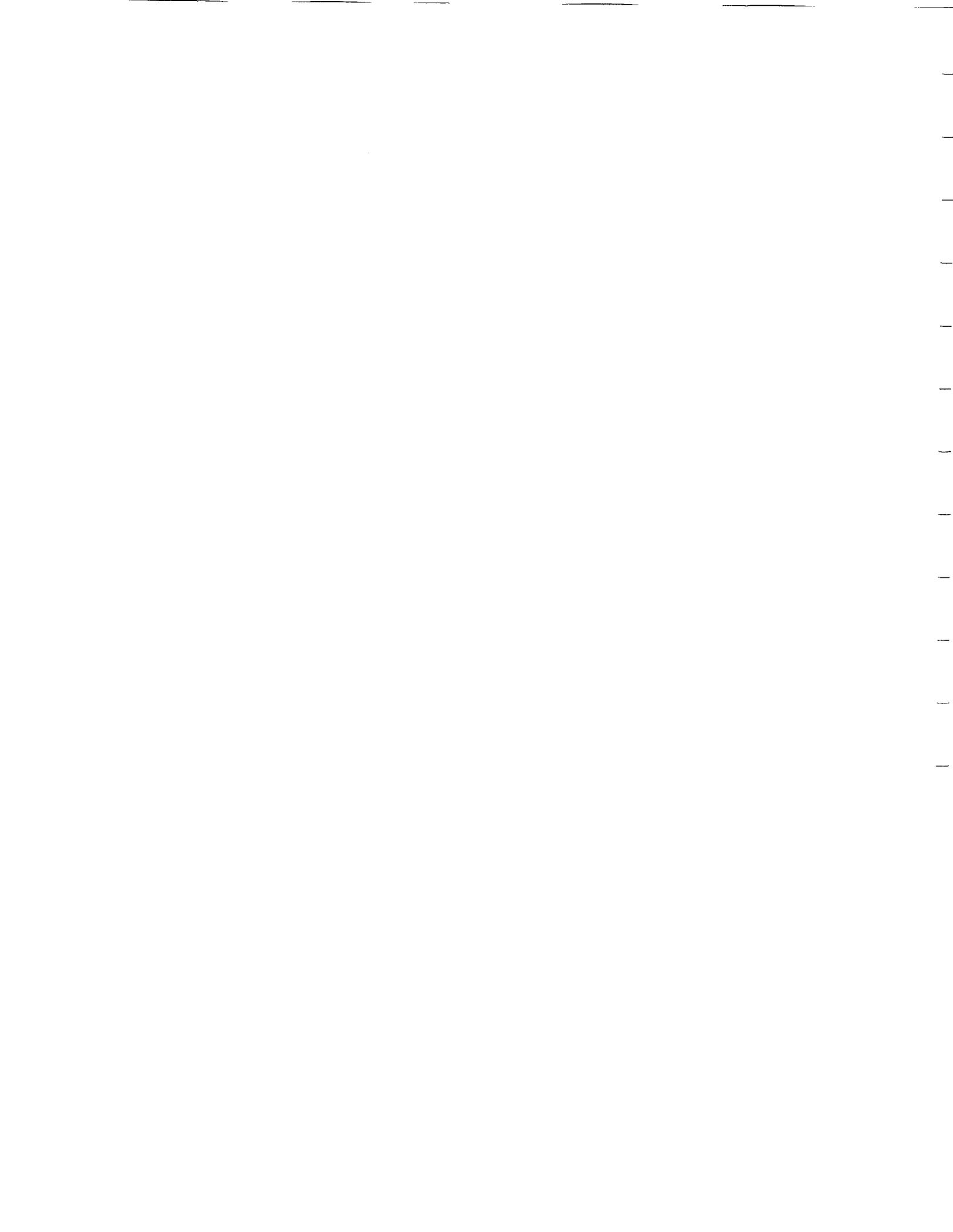
Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities participating in the March 29, 2000 exercise to test the offsite emergency response capabilities of State and local governments in the 10-mile EPZ surrounding the Vogtle Electric Generating Plant.

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in exercise objectives contained in FEMA-REP-14, REP Exercise Manual, September 1991. Detailed information on the exercise objectives and the extent-of-play agreement used in this exercise are found in Appendix 3 of this report.

### **A. Summary Results of Exercise Evaluation - Table 2**

The matrix presented in Table 2, on the following page(s), presents the status of all exercise objectives from FEMA-REP-14 which were scheduled for demonstration during this exercise. Exercise objectives are listed by number and the demonstration status of those objectives is indicated by the use of the following letters:

- M - Met (No Deficiency or ARCAs assessed and no unresolved ARCAs from prior exercises)
- D - Deficiency assessed
- A - ARCA(s) assessed or unresolved ARCA(s) from prior exercise(s)
- N - Not Demonstrated (Reason explained in Subsection B)



**Table 2. Summary Results of Exercise Evaluation**

**DATE AND SITE: March 29, 2000 – Vogtle Electric Generating Plant**

Jurisdiction or Functional Entity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
<b>STATE OF GEORGIA</b>																																			
FEOC	M	M	M	M					M	M	M	M												M											
Dose Assessment		M	M	M			M		M															M											
Radiological FMTs	M			M	M	M		M																											
Emergency News Center		M		M								M	M																						
Emergency Operations Facility	M	M	M	M																															
<b>BURKE COUNTY</b>																																			
Emergency Operations Center	M	M	M	M					M	M	M				M																				
Traffic Control Points				M	M												M																		
<b>STATE OF SOUTH CAROLINA</b>																																			
FEOC	M	M	M	M					M	M	M													M											
Dose Assessment			M	M			M		M																										
Emergency News Center		M		M									M	M																					
State Traffic Control Points					M													M																	
<b>AIKEN COUNTY</b>																																			
Emergency Operations Center	M	M	M	M					M	M	M		M	M											M										
Reception/Congregate Care				M	M														M	M															
Emergency Worker Decon				M	M																			M											
Traffic Control Points				M	M													M																	
<b>ALLENDALE COUNTY</b>																																			
Emergency Operations Center	M	M	M	M					M	M	M		M	M											M										
Traffic Control Points				M	M													M																	
Reception /Congregate Center				M	M															M	M														
Emergency Worker Decon				M	M																			M											
<b>BARNWELL COUNTY</b>																																			
Emergency Operations Center	M	M	M	M					M	M	M		M	M											M										
Traffic Control Points				M	M													M																	
Emergency Worker Decon				M	M																			M											

**LEGEND:**

**M** = Met (No Deficiency or ARCAs assessed and no unresolved prior ARCAs)

**D** = Deficiency(ies) assessed

**A** = ARCA (s) assessed and/or unresolved prior ARCAs



## B. Status of Jurisdictions Evaluated

This subsection provides information on the evaluation of each participating jurisdiction and functional entity, in a jurisdiction based, issues only format. Presented below is a definition of the terms used in this subsection relative to objective demonstration status.

- **Met** - Listing of the demonstrated exercise objectives under which no Deficiencies or ARCAs were assessed during this exercise and under which no ARCAs assessed during prior exercises remain unresolved.
- **Deficiency** - Listing of the demonstrated exercise objectives under which one or more Deficiencies was assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.
- **Area Requiring Corrective Actions** - Listing of the demonstrated exercise objectives under which one or more ARCAs were assessed during the current exercise or ARCAs assessed during prior exercises that remain unresolved. Included is a description of the ARCAs assessed during this exercise and the recommended corrective action to be demonstrated before or during the next biennial exercise.
- **Not Demonstrated** - Listing of the exercise objectives which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.
- **Prior ARCAs - Resolved** - Descriptions of ARCAs assessed during previous exercises which were resolved in this exercise and the corrective actions demonstrated.
- **Prior ARCAs - Unresolved** - Descriptions of ARCAs assessed during prior exercises which were not resolved in this exercise. Included is the reason the ARCA remains unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

The following are definitions of the two types of exercise issues which are discussed in this report.

- A **Deficiency** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant."

- An **ARCA** is defined in FEMA-REP-14 as "...an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety."

FEMA has developed a standardized system for numbering exercise issues (Deficiencies and ARCAs). This system is used to achieve consistency in numbering exercise issues among FEMA Regions and site-specific exercise reports within each Region. It is also used to expedite tracking of exercise issues on a nationwide basis.

The identifying number for Deficiencies and ARCAs includes the following elements, with each element separated by a hyphen (-).

- **Plant Site Identifier** - A two-digit number corresponding to the Utility Billable Plant Site Codes.
- **Exercise Year** - The last two digits of the year the exercise was conducted.
- **Objective Number** - A two-digit number corresponding to the objective numbers in FEMA-REP-14.
- **Issue Classification Identifier** - (D = Deficiency, A = ARCA). Only Deficiencies and ARCAs are included in exercise reports.
- **Exercise Issue Identification Number** - A separate two (or three) digit indexing number assigned to each issue identified in the exercise.

# **I. STATE OF GEORGIA**

## **1.1 Forward Emergency Operations Center**

The Forward Emergency Operation Center (FEOC) is co-located with the Burke County Emergency Operation Center (EOC). The FEOC staff was professional, knowledgeable and enthusiastically carried out their duties. FEOC staff delayed their arrival to coincide with actual deployment from the State EOC. The staff functioned well as a team, used a checklist and effectively coordinated all appropriate actions with the State of South Carolina and Burke County.

- a. MET: Objectives 1, 2, 3, 4, 9, 10, 11, 12 and 23**
- b. DEFICIENCY: NONE**
- c. AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. NOT DEMONSTRATED: NONE**
- e. PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-11-A-01

**Description:** The FEOC develops news releases and the contents of the news release are reviewed and approved by the FEOC Chief, DNR, SCEPD and Burke County EMA. News release number 4 indicated that a discharge of radioactive materials into the Savannah had occurred and that persons within 10-miles of the plant on the Savannah River be evacuated. The distance for evacuation downstream was indicated as 45 miles. The news release contained errors concerning the radioactive release and the distance to be evacuated. The error in the distance to be evacuated was corrected by the State PIO during a news briefing.

**Corrective Action Demonstrated:** Revised procedures for reviewing news releases for accuracy prior to final review and approval were successfully demonstrated. Four media briefings were conducted without error and kept the public informed of activities of the Vogtle Electric Generating Plant. The staff acted promptly when the fax machine failed and quickly transitioned to e-mail as backup for state press releases. They performed their respective responsibilities in an efficient and professional manner.

- f. PRIOR ARCAs - UNRESOLVED: NONE**

## 1.2 Dose Assessment

The dose assessment team was comprised of personnel from the Environmental Radiation Office, Department of Natural Resources which was co-located with the FEOC. The team coordinated well with the State of South Carolina, local officials and representatives at the plant. They performed dose projections and made timely protective action recommendations (PARs) to the Governor's representative.

- a. **MET:** Objectives 2, 3, 4, 7, 9 and 23
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

## 1.3 Radiological Field Monitoring Teams

The Field Monitoring Teams (FMTs) had excellent communication equipment and had no difficulty in communicating with the Field Team Coordinator (FTC) in the Emergency Operations Facility (EOF). The capability to monitor and control radiation exposure to emergency workers was demonstrated. The FMTs demonstrated the appropriate use of equipment and procedures for determining the field radiation measurements. All instruments were recently calibrated. The FMTs demonstrated the appropriate use of equipment and procedures for the measurement of airborne radioiodine concentrations. An air sample was requested by the FTC. Both FMTs were very knowledgeable and eager to carry out the duties, and were knowledgeable of monitoring procedures.

- a. **MET:** Objectives 1, 4, 5, 6 and 8
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-05-A-02

**Description:** The FMT members would not be able to terminate their mission by their own decision if a turn-back value was reached of 3.0R since they did not have the appropriate dosimeters. A 3.0R reading cannot be accurately read on a 0-200 mR or a 0-200 R dosimeter. In addition, in the SOP, Procedure DNR-EPD-ERP6.0 discusses the CDV-742 (0-200R) dosimeter while the Procedure DNR-EPD-ERP 1.0 Appendix A: Equipment List, only calls for a high range dosimeter of 0-20 R.

**Corrective Action Demonstrated:** Each team member is now issued one direct-reading dosimeter, a 0-5R. The FMT members were able to easily read the 1.0R value with the 0-5R dosimeter if required. The SOPs have been changed to list the 0-5R dosimeter.

**Issue No.:** 68-98-08-A-03

**Description:** The instruments should have a specific reading when a known radioactive source is used to check the survey meter to check if the instrument is working properly. The "B" Field Team did not check their radiation monitoring instruments before dispatch for proper response using a check source, as called for in Procedure DNR-EPD-ERP 1.0, Section 6.1.4.2. Also, in reassembling the sample head after counting the first air sample, the team overlooked a contamination control step in Procedure DNR-EPD-ERP 1.0, Section 6.3.2.015, that calls for them to wipe the sample head clean and change gloves before reassembling the sample head.

**Corrective Action Demonstrated:** Each instrument case had a known radioactive source for checking the survey meters to check if the instrument was working properly with specific readings required on the instruments. In reassembling the sample head after counting the first sample, the team wiped the sample head clean and simulated changing gloves before reassembling the simple head.

**f. PRIOR ARCAs - UNRESOLVED: NONE**

## 1.4 Emergency News Center

The Emergency News Center (ENC) was established at the Burke County Office Park in Waynesboro, Georgia, and was activated at 0941. The ENC is the source of all official emergency information and instructions from government officials in both Georgia and South Carolina to the public. Four media briefings were conducted to keep media representatives and the public informed as to activities at the Vogtle Electric Generating Plant. The Georgia Governor directed the evacuation of the entire EPZ in Georgia. The South Carolina Governor chose to have the two zones in South Carolina shelter in place. These actions involved about 3,000 citizens. During the exercise 84 rumor calls were received from citizens and media seeking information. These calls were answered promptly and accurately. The professionalism of the staff at all levels at the ENC was obvious, and indicated that they were well trained and performed in this exercise as if it were an actual emergency. This was further demonstrated when the fax machine at the FEOC failed and the staff was able to substitute e-mails to the utility computers to provide the state press releases.

- a. **MET:** Objectives 2, 4, 12 and 13
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

## 1.5 Emergency Operations Facility

The utility operator's EOF, located onsite in the Training Center, is an excellent facility from which all participating response organizations can effectively manage ongoing emergency operations. Communications, coordination, and the flow of technical information between the utility operator, officials of the Nuclear Regulatory Commission, and the applicable State officials were outstanding. All of the State officials deployed to the EOF were well trained, followed applicable procedures; and overall, performed their respective responsibilities in an efficient and professional manner.

- a. **MET:** Objectives 1, 2, 3 and 4
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs - RESOLVED: NONE**
- f. **PRIOR ARCAs - UNRESOLVED: NONE**

## **2. RISK JURISDICTIONS**

### **2.1 BURKE COUNTY**

#### **2.1.1 Emergency Operations Center**

The EOC is an excellent facility that provides all the amenities required to accomplish its mission. The Emergency Management Director did an excellent job of coordinating activities among the various county and volunteer organizations, assisted by the Operations Chief who effectively and efficiently directed staff activities within the EOC. The County Administrator was present during the exercise and represented the County Commission in making key decisions on precautionary and evacuation actions. Worthy of special commendation was the use of the exercise to train new staff projected for assignment to key positions. Cooperation and interaction between all participants was excellent and a tribute to the public service capability developed in the county.

- a. **MET: Objectives 1, 2, 3, 4, 9, 10, 11 and 15**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs - RESOLVED: NONE**
- f. **PRIOR ARCAs - UNRESOLVED: NONE**

#### **2.1.2 Traffic Control Points**

The evaluation was done by interview in accordance with the extent-of-play. Two County Sheriff's Deputies were interviewed after they had been issued radiological kits. The Deputies had received radiological monitoring training and were aware of their duties, routes, shelter location and resources necessary to control evacuation traffic flow and to control access to evacuated areas and the shelter area.

- a. **MET:** Objectives 4, 5 and 17
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

### 3. STATE OF SOUTH CAROLINA

#### 3.1 Forward Emergency Operations Center

South Carolina activated its EOC, in Columbia, at 0945, following notification of an Alert at the Vogtle Electric Generating Plant. Direction and control was transferred to the FEOC in the South Carolina Army Reserve National Guard (SCARNG) Armory in Graniteville, South Carolina at 1000. The FEOC Director provided leadership and direction to a well-trained and capable staff. Coordination with the State of Georgia, Vogtle Electric Generating Plant and the Counties of Aiken, Allendale, and Barnwell was timely and consistent throughout the exercise. PARs were coordinated, timely and consistent with plant status. Alert and notification of the EPZ population was timely, accurate, and appropriate for the exercise. All of the EOC staff is commended for their preparation for and performance during this exercise.

- a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11 and 23
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-13-A-04

**Description:** Rumor control was not demonstrated in Aiken and Allendale Counties in accordance with the extent-of-play agreement.

**Corrective Action Demonstrated:** Both Aiken and Allendale Counties demonstrated rumor control by receiving and answering numerous rumor control calls with no difficulty.

- f. **PRIOR ARCAs - UNRESOLVED: NONE**

### 3.2. Dose Assessment

The South Carolina Department of Environmental Control (SCDHEC) Dose Assessment Group was located at the FEOC. This group used computer modeling, plant conditions, and input from radiation monitoring teams to demonstrate the ability to make dose projections for PARs to the South Carolina FEOC staff.

- a. **MET: Objectives 3, 4, 7 and 9**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.: Robinson ARCA 54-99-07-A-01**

**Description:** No data, from either the utility or DHEC field teams is received at DHEC Dose Assessment. Consequently, actual doses received in the field are not considered by DHEC Dose Assessment in making their recommendations for protective actions to the Emergency Preparedness Division (EPD) via the DHEC liaison at the SEOC. Only DHEC field team data is transmitted to the Director of the Laboratory who is dependent upon Dose Assessment to send copies of dose projections in order to evaluate the consistency of the projections against the actual data. No dose projections were transmitted to the Director during this exercise. It was not clear how the Director's evaluation is input into the decision making process, but in any case, this evaluation process imposes an additional delay in the decision making process as well as lending itself to failure to protect the public if such evaluations are not made.

**Corrective Action Demonstrated:** The ARCA from the December 7, 1999 H.B. Robinson exercise was the failure to have radiation field team monitoring data inputted to the dose assessment group to be used in dose projections and protective action recommendations. During this March 29, 2000 Vogtle exercise, radiation field monitoring data from the utility was sent to dose assessment personnel and was used in their deliberations.

- f. **PRIOR ARCAs - UNRESOLVED: NONE**

### **3.3 Radio Station WBBQ**

WBBQ is the EAS radio station that serves the operational area that includes the 10-mile EPZ for the Vogtle Electric Generating Plant. The manager of the radio station wrote the EAS plan for this operational area. Both the State of South Carolina and Burke County requested the broadcast of emergency messages. The station followed its procedures to activate the EAS.

### **3.4 State Traffic Control Points**

Traffic control point/access control point (ACP) activities were discussed at the Aiken County EOC with two South Carolina Highway Patrol Officers. The Radiological Officer gave an in-depth briefing. Appropriate dosimetry was issued. The need to establish traffic/access control points was discussed. All of the TCP/ACP personnel interviewed demonstrated a thorough understanding of their duties.

- a. **MET:** Objectives 4, 5 and 17
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

## **4. RISK JURISDICTIONS**

### **4.1 AIKEN COUNTY**

#### **4.1.1 Emergency Operations Center**

The Aiken County EOC staff demonstrated their objectives associated with the Vogtle Electric Generating Plant exercise. The Emergency Preparedness Coordinator and the Emergency Services Director provided excellent direction and control, decision-making, coordination and alert and notification of the public. Frequent staff briefings and updates were given. A dedicated staff supported the operation and performed activity coordination as needed. The Radiological Detection Officer gave clear and concise directions to the emergency workers before releasing them to perform outside activities. The rumor control staff received and handled numerous inquiries. This was an excellent demonstration of the County's capabilities.

- a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 and 23
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

#### **4.1.2 Reception Center and Congregate Care**

Reception center and congregate care capabilities in Aiken County were demonstrated at South Aiken High School, where several students served as evacuees and were routed through monitoring, decontamination, and registration into the shelter. Players were enthusiastic and highly knowledgeable. The teamwork displayed between all participating agencies and organizations was outstanding.

- a. **MET:** Objectives 4, 5, 18 and 19
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** N/A
- f. **PRIOR ARCAs - UNRESOLVED:** N/A

#### **4.1.3 Emergency Worker Decontamination**

Personnel of the Aiken County Public Works Department successfully demonstrated emergency worker monitoring and decontamination on the grounds of Redcliffe Elementary School. One vehicle was monitored, using a Ludlum Model-3 monitoring instrument. Decontamination procedures were discussed. Appropriate dosimetry and procedures were used. Communication was established without any disruption. Relocating this operation to a non-school facility was discussed. All personnel assigned to this location demonstrated an excellent working knowledge of their duties and carried out those duties in a professional manner.

- a. **MET:** Objectives 4, 5 and 22
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

#### 4.1.4 Traffic Control Points

Traffic and access control point activities were discussed at the Aiken County EOC with three Aiken County Deputy Sheriff's. The Radiological Officer gave an in-depth briefing and appropriate dosimetry was issued. Due to a previous ARCA concerning call-in and turn-back values this subject was thoroughly covered. County plans have been revised to agree with State plans and the previous ARCA has been corrected. The need to establish traffic/access control points was discussed. All of the personnel interviewed demonstrated a thorough understanding of their duties.

- a. **MET:** Objectives 4, 5 and 17
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** Objective
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-05-A-05

**Description:** Discrepancy between call-in and turn-back values in the state plan and local plan. State values are 0.1R for call-in and 1R for turn-back. The County Plan established 1R for call-in and 5R for turn-back. Although they used state values for this exercise and indicate that their plan would be changed to reflect state values.

**Corrective Action Demonstrated:** The County plans have been revised to agree with the State Plans regarding turn-back and call-in values.

- f. **PRIOR ARCAs - UNRESOLVED:** NONE

## **4.2 ALLENDALE COUNTY**

### **4.2.1 Emergency Operations Center**

The Allendale County Emergency Preparedness Director effectively coordinated emergency operations during the Vogtle Electric Generating Plant exercise. The staff was competent, conscientious, and worked as a team. The EOC staff coordinated well with the State and other 10-mile EPZ counties in the implementation of PADs and in issuing EAS messages. The State liaison was pro-active in resolving conflicts. The State, utility and DHEC liaisons provided vital support to the EOC operations. There was timely and consistent message logging, EOC briefings, and logging of Rumor Control inquiries. The EOC was spacious and equipment worked well.

- a. **MET: Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 and 23**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs - RESOLVED: N/A**
- f. **PRIOR ARCAs - UNRESOLVED: N/A**

### **4.2.2 Traffic Control Points**

An Allendale County Deputy Sheriff was interviewed at the Allendale County EOC to demonstrate this TCP objective in accordance with the extent-of-play agreement. The officer was familiar with traffic control procedures related to a radiological emergency and was aware of appropriate instructions to provide evacuees. He had been trained in radiological procedures, to include call-in and turn-back values, periodic reading of dosimeter, use of KI and record keeping.

- a. **MET: Objectives 4, 5 and 17**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-05-A-06

**Description:** The issuer of Emergency Worker dosimetry was new at the position and did not provide adequate information to the State Trooper. No record-keeping or information card, which have call-in and turn-back values, was not issued to the Trooper. The card would have told him of call-in and turn-back values. (K.3.a)

**Corrective Action Demonstrated:** The Officer interviewed was thoroughly knowledgeable of radiological procedures that included record keeping, appropriate intervals for reading dosimeters, call-in and turn-back values and use of KI. He also had the state issued instruction card.

f. **PRIOR ARCAs - UNRESOLVED:** NONE

#### **4.2.3 Reception Center and Congregate Care**

The Ulmer Volunteer Fire Department demonstrated the reception center and congregate care operations and monitored evacuees at the Allendale Elementary School. The use of a portal monitor expedited the initial monitoring. Congregate care was managed by the Orangeburg Chapter of the American Red Cross (ARC) and was supported by the Allendale Department of Social Services. Sufficient services and amenities were available. All staff members at the reception and congregate care center were knowledgeable and well trained.

a. **MET:** Objectives 4, 5, 18 and 19

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:** NONE

f. **PRIOR ARCAs - UNRESOLVED:** NONE

#### 4.2.4 Emergency Worker Decontamination

The six members of the Fairfax Volunteer Fire Department were enthusiastic and knowledgeable of their functions and responsibilities. The emergency worker monitoring and decontamination was conducted at the Sanders Transportation Company in Allendale. The Fairfax Volunteer Fire Department successfully demonstrated the monitoring and decontamination of emergency workers and vehicles. The emergency workers were familiar with the dosimetry, turn-back values and KI.

- a. **MET:** Objectives 4, 5 and 22
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 68-98-22-A-07

**Description:** The emergency worker monitoring and decontamination team had not received the necessary training or practice to interpret the simulated contamination of 400 cpm or 'twice-background' and take the appropriate actions. Contamination control procedures were unclear, especially for transporting Emergency Workers to the reception center for decontamination.

**Corrective Action Demonstrated:** The Fairfax Volunteer Fire Department that staffed the emergency worker monitoring and decontamination station in Allendale, on March 29, 2000, were knowledgeable and well trained in the use of dosimetry and survey meters. They were also knowledgeable about contamination control in the transportation of emergency workers from the emergency worker monitoring and decontamination station to the reception center. The emergency workers had been appropriately trained in February 2000.

- f. **PRIOR ARCAs - UNRESOLVED:** NONE

## **4.3 BARNWELL COUNTY**

### **4.3.1 Emergency Operations Center**

The Barnwell County EOC successfully demonstrated all objectives for the Vogtle Electric Generating Plant Exercise. The EOC staff was effectively managed throughout the exercise and maintained a high degree of professionalism and dedication to assigned duties. The Chairman of the Council and the County Administrator were present in the EOC and assisted in the decision making process. Being co-located with the 911 center provides for a good interchange of information to the EOC. Volunteer agencies such as Radio Amateur Civil Emergency Service (RACES) and others did a good job and enhanced the EOC operation. The utility representatives did an excellent job of providing updates on the plant condition. The Director of the Barnwell County EOC used a color coding system to track on-going assignments, which proved to be very effective. He could merely glance at the board and tell if an assignment had been completed in the allotted time. The EOC staff is commended for doing an outstanding job.

- a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 and 23
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

### **4.3.2 Traffic Control Points**

One Allendale County Deputy (acting for Barnwell County by mutual agreement) was interviewed relative to this objective. The officer was thoroughly familiar with traffic access and controls procedures and was well-trained in radiological procedures to include call-in and turn-back values, reporting requirements, use of KI and record keeping. This was an excellent demonstration.

- a. **MET:** Objectives 4, 5 and 17
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED: NONE**

f. **PRIOR ARCAs - UNRESOLVED: NONE**

### **4.3.3 Emergency Worker Decontamination**

Barnwell County is fortunate in that emergency worker and vehicle decontamination are performed utilizing the staff and facilities at the Chem-Nuclear Systems, Inc. site near the town of Barnwell. Chem-Nuclear Systems, Inc. is one of the nation's premier facilities with trained personnel and equipment to handle, decontamination and disposal of radioactive materials and equipment. As such, they are uniquely qualified to provide emergency worker and vehicle decontamination operations for the county.

a. **MET: Objectives 4, 5 and 22**

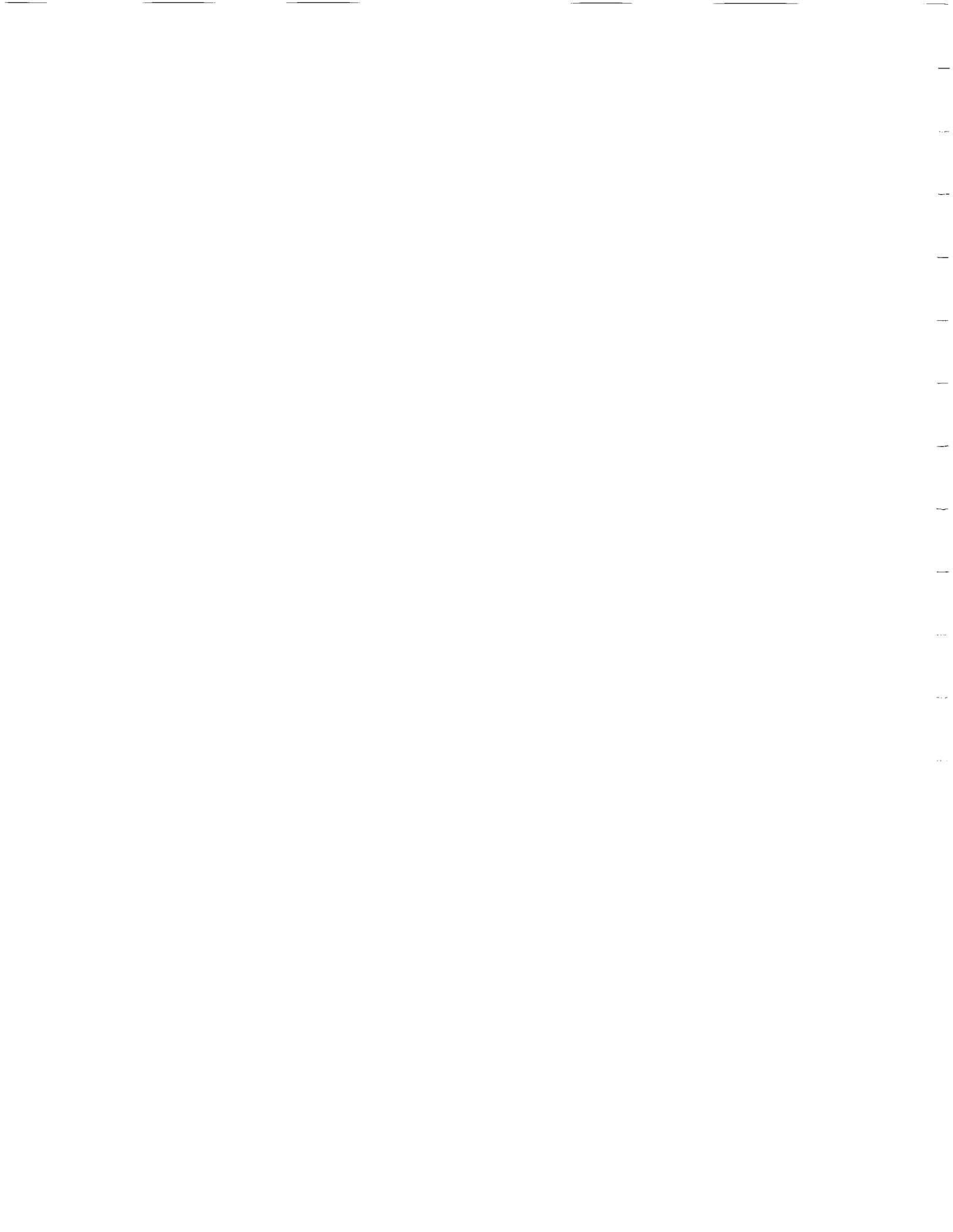
b. **DEFICIENCY: NONE**

c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**

d. **NOT DEMONSTRATED: NONE**

e. **PRIOR ARCAs - RESOLVED: NONE**

f. **PRIOR ARCAs - UNRESOLVED: NONE**



## **5. SUMMARY LIST OF DEFICIENCY(ies) AND/OR AREA(s) REQUIRING CORRECTIVE ACTION**

### **5.1.1 STATE OF GEORGIA FEOC**

**Issue No.:** 68-98-11-A-01

**Description:** The FEOC develops news releases and the contents of the new release are reviewed and approved by the FEOC Chief, DNR, SCEPD and Burke County EMA. News release number 4 indicated that a discharge of radioactive materials into the Savannah had occurred and that persons within 10 miles of the plant on the Savannah River be evacuated. The distance for evacuation downstream was indicated as 45 miles. The news release contained errors concerning the radioactive release and the distance to be evacuated. The error in the distance to be evacuated was corrected by the State PIO during a news briefing.

**Corrective Action Demonstrated:** Revised procedures for reviewing news releases for accuracy prior to final review and approval were successfully demonstrated. Four media briefings were conducted without error to keep the public informed of the activities of Vogtle Electric Generating Plant. The staff acted promptly when the fax machine failed and quickly transitioned to Email as backup for state press releases. They performed their respective responsibilities in an efficient and professional manner.

### **5.1.2 Radiological Field Monitoring Teams**

**Issue No.:** 68-98-05-A-02

**Description:** The FMT members would not be able to terminate their mission by their own decision if a turn-back value of 3.0 R was reached since they did not have the

### 5.1.2 Radiological Field Monitoring Teams (cont'd)

appropriate dosimeters. A 3.0 R reading cannot be accurately read on a 0-200 mR or a 0-200 R dosimeter. In addition, in the SOP, Procedure DNR-EPD-ERP 6.0 discusses the CDV-742 (0-200R) dosimeter while the Procedure DNR-EPD-ERP 1.0 Appendix A: Equipment List, only calls for a high range dosimeter of 0-20 R.

**Corrective Action Demonstrated:** Each team member is now issued one direct-reading dosimeter, a 0-5R. The FMT members were able to easily read the 1.0R Radiological Field Monitoring Teams value with the 0-5R dosimeter if required. The SOPs have been changed to list the 0-5R dosimeter.

### 5.1.3 Radiological Field Monitoring Teams

**Issue No.:** 68-98-08-A-03

**Description:** The instruments did not have an indication of the target reading for a known radioactive source. The source was used to check the survey meter for proper operation. Field Team "B" did not check their radiation monitoring instruments before dispatch for proper response using a check source, as called for in Procedure DNR-EPD-ERP 1.0, Section 6.1.4.2. Also, in reassembling the sample head after counting the first air sample, the team overlooked a contamination control step in Procedure DNR-EPD-ERP 1.0, Section 6.3.2.015, that calls for them to wipe the sample head clean and change gloves before reassembling the sample head.

**Corrective Action Demonstrated:** Each instrument case had a known radioactive source for checking the survey meters to check if the instrument is working properly with specific readings required on the instruments. In reassembling the sample head after counting the first sample, the team wiped the sample head clean and

#### **5.1.4 STATE OF SOUTH CAROLINA FEOC**

changed gloves (simulated) before reassembling the sample head.

**Issue No.:** 68-98-13-A-04

**Description:** Rumor control was not demonstrated in Aiken and Allendale Counties in accordance with the extent-of-play.

**Corrective Action Demonstrated:** Both Aiken and Allendale Counties demonstrated rumor control by receiving and answering numerous rumor control call with no difficulty.

#### **5.1.5 DOSE ASSESSEMENT (H. B. Robinson Exercise 12/7/99)**

**Issue No.:** H. B. Robinson ARCA 54-99-07-A-01

**Description:** No data, from either the utility or DHEC field teams is received at DHEC Dose Assessment. Consequently, actual doses received in the field are not considered by DHEC Dose Assessment in making their recommendations for protective actions to the Emergency Preparedness Division (EPD) via the DHEC liaison at the SEOC. Only DHEC field team data is transmitted to the Director of the Laboratory who is dependent upon Dose Assessment to send copies of dose projections in order to evaluate the consistency of the projections against the actual data. No dose projections were transmitted to the Director during this exercise. It was not clear how the Director's evaluation is input into the decision making process, but in any case, this evaluation process imposes an additional delay in the decision making process as well as lending itself to failure to protect the public if such evaluations are not made.

**Corrective Action Demonstrated:** The ARCA from the December 7, 1999 H.B. Robinson exercise was the failure to have

radiation field team monitoring data inputted to the dose assessment group to be used in dose projections and protective action recommendations. During this March 29, 2000 Vogtle exercise, radiation field monitoring data from the utility was sent to dose assessment and was used in their deliberations.

### **5.1.6 AIKEN COUNTY TCPs**

**Issue No.:** 68-98-05-A-05

**Description:** A discrepancy exists between the call-in and turn-back values in the State and local plans. State values are 0.1R for call-in and 1R for turn-back. The County Plan has 1R for call-in and 5R for turn-back. They used State values for this exercise and indicated that their plan would be changed to reflect State values.

**Corrective Action Demonstrated:** The County plans have been revised to agree with the State plans regarding turn-back and call-in values.

### **5.1.7 ALLENDALE COUNTY TCP**

**Issue No.:** 68-98-05-A-06

**Description:** The Issuer of Emergency Worker dosimetry was new at the position and did not provide adequate information to the State Trooper. No record-keeping or information card, which have call-in and turn-back values, was issued to the Trooper. The card would have informed him of call-in and turn-back values. (K.3.a)

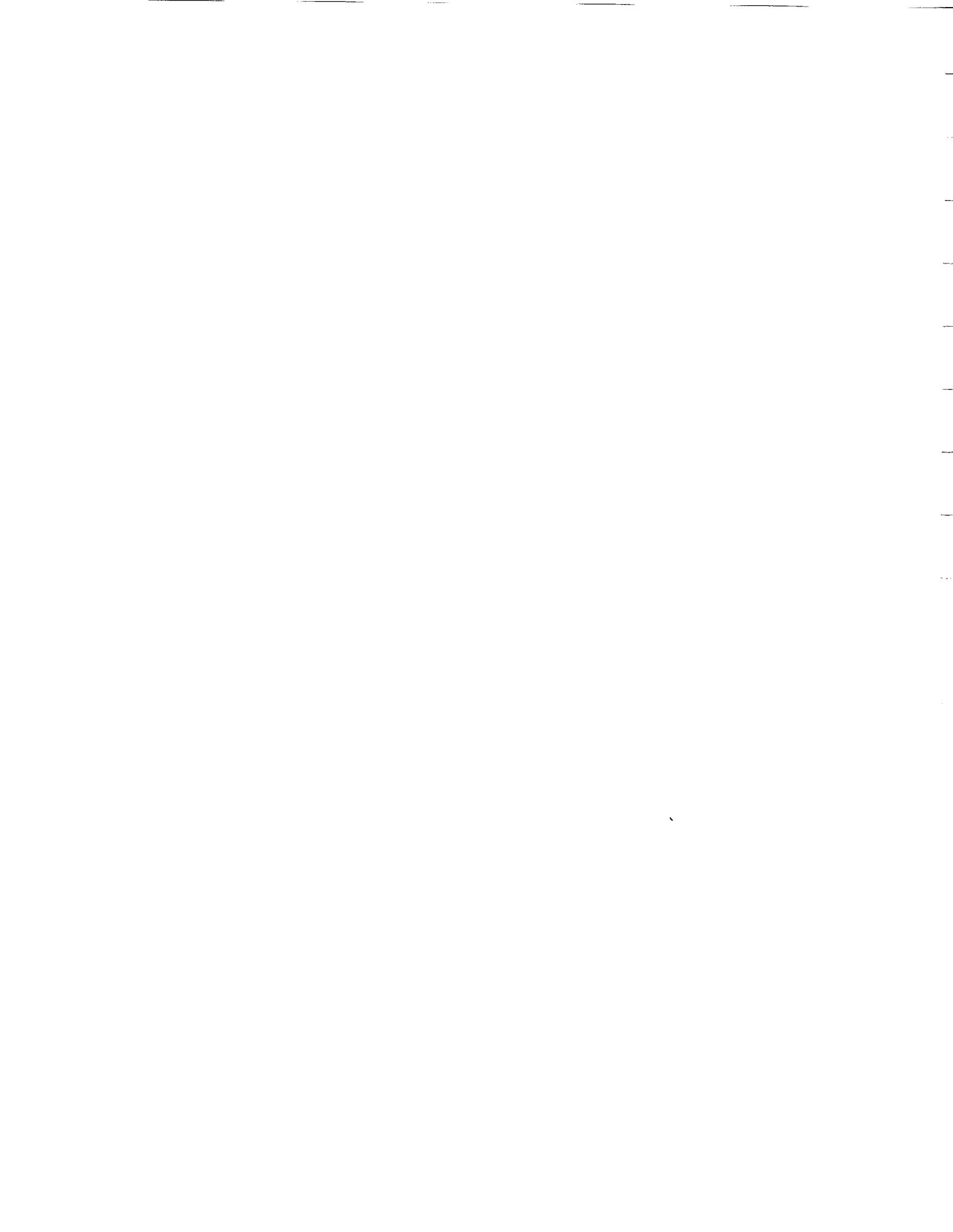
**Corrective Action Demonstrated:** The Officer interviewed was thoroughly knowledgeable of radiological procedures that included record keeping, appropriate intervals for reading dosimeters, call-in and turn-back values and use of KI. He also had the state issued instruction card.

## **5.1.8 EW Decontamination**

**Issue No.:** 68-98-22-A-07

**Description:** The emergency worker monitoring and decontamination team had not received the necessary training or practice to interpret the simulated contamination of 400 cpm or 'twice-background' and take the appropriate actions. Contamination control procedures were unclear, especially for transporting Emergency Workers to the reception center for decontamination.

**Corrective Action Demonstrated:** The Fairfax Volunteer Fire Department that staffed the emergency worker monitoring and decontamination station in Allendale, on March 29, 2000 were knowledgeable and well trained in the use of dosimetry and survey meters. They were also knowledgeable about contamination control in the transportation of emergency workers from the emergency worker monitoring and decontamination station to the reception center. The emergency workers had been appropriately trained in February 2000.

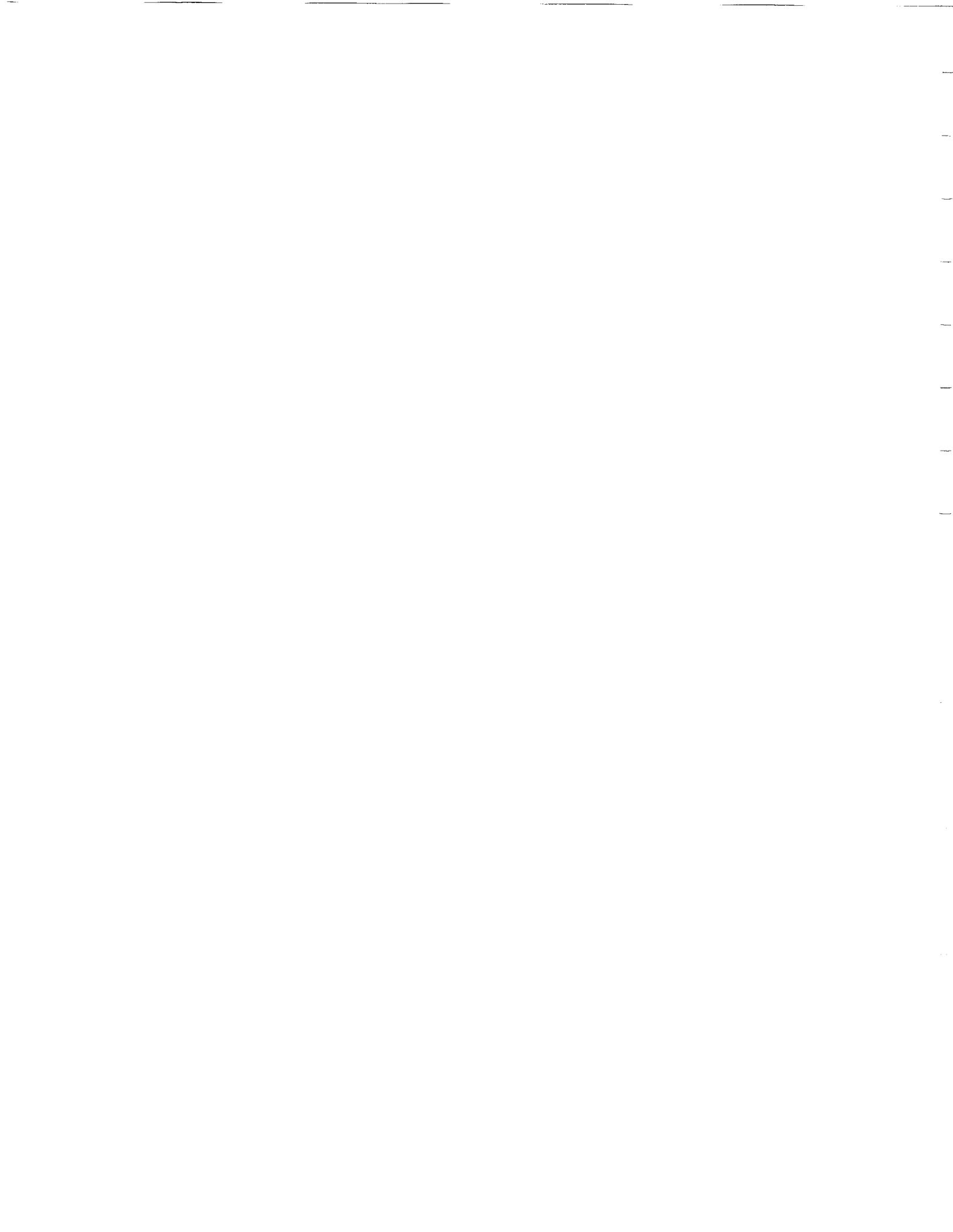


## APPENDIX 1

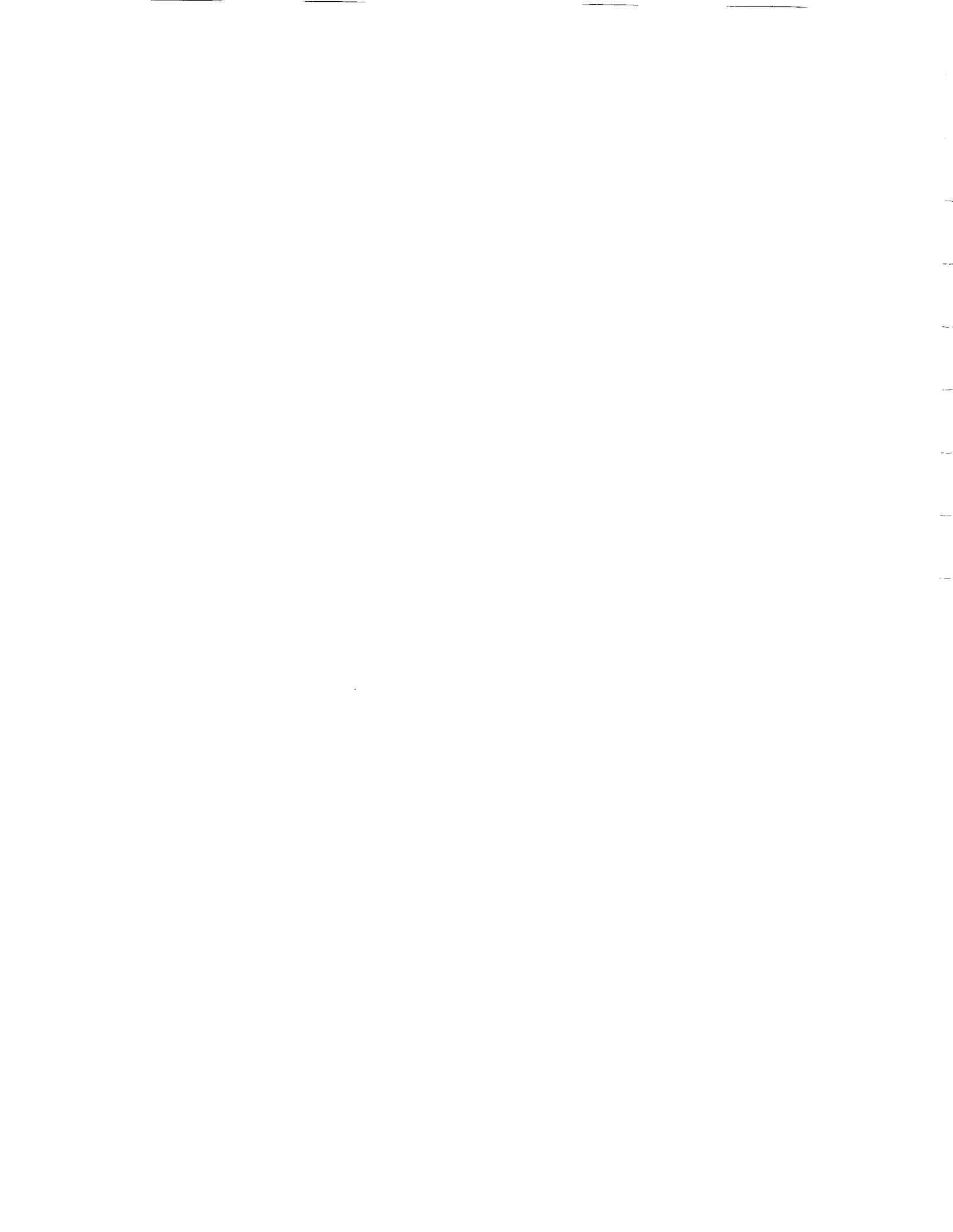
### ACRONYMS AND ABBREVIATIONS

The following is a list of the acronyms and abbreviations which may have been used in this report.

ACP	Access Control Point
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARES	Amateur Radio Emergency Service
CDV	Civil Defense - Victoreen
CFR	Code of Federal Regulations
DHEC	Department of Health and Environmental Control
DHHS	Department of Health and Human Services
DOC	Department of Commerce
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
DRD	Direct Reading Dosimeter
EAS	Emergency Alert System
EEM	Exercise Evaluation Methodology
EMS	Emergency Medical Services
ENC	Emergency News Center
ENN	Emergency Notification Network
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Emergency Operations Procedures
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
EWD	Emergency Worker Decontamination
EW	Emergency Worker
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FEOC	Forward Emergency Operations Center
FMT	Field Monitoring Teams
FR	Federal Register
FTC	Field Team Coordinator



GE	General Emergency
HP	Health Physics
JIC	Joint Information Center
KI	Potassium Iodide
mR	milliroentgen
mR/h	milliroentgen per hour
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NUREG-0654	NUREG-0654/FEMA-REP-1, Rev. 1, <i>"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, November 1980"</i>
ORO	Offsite Response Organization
PAD	Protective Action Decision
PAR	Protective Action Recommendation
PIO	Public Information Officer
R	Roentgen
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RC	Reception Center
REA	Radioactive Emergency Area
REM	Roentgen Equivalent Man
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
R/h	Roentgen(s) per hour
RO	Radiological Officer
SAE	Site Area Emergency
SCARNG	South Carolina Army Reserve National Guard
SCEPD	South Carolina Emergency Preparedness Division
SCORERP	South Carolina Operational Radiological Emergency Response Plan
SEOC	State Emergency Operations Center
SOG	State Operating Guidance
SRS	Savannah River Site
TCP	Traffic Control Point
TLD	Thermoluminescent Dosimeter
USDA	U.S. Department of Agriculture



## APPENDIX 2

### EXERCISE EVALUATORS

The following is a list of personnel who evaluated the Vogtle Electric Generating Plant exercise on March 29, 2000. The organization represented by each evaluator is indicated by the following abbreviations:

ANL	- Argonne National Laboratory
EPA	- Environmental Protection Agency
FDA	- Food and Drug Administration
FEMA	- Federal Emergency Management Agency
NRC	- Nuclear Regulatory Commission

#### STATE OF GEORGIA

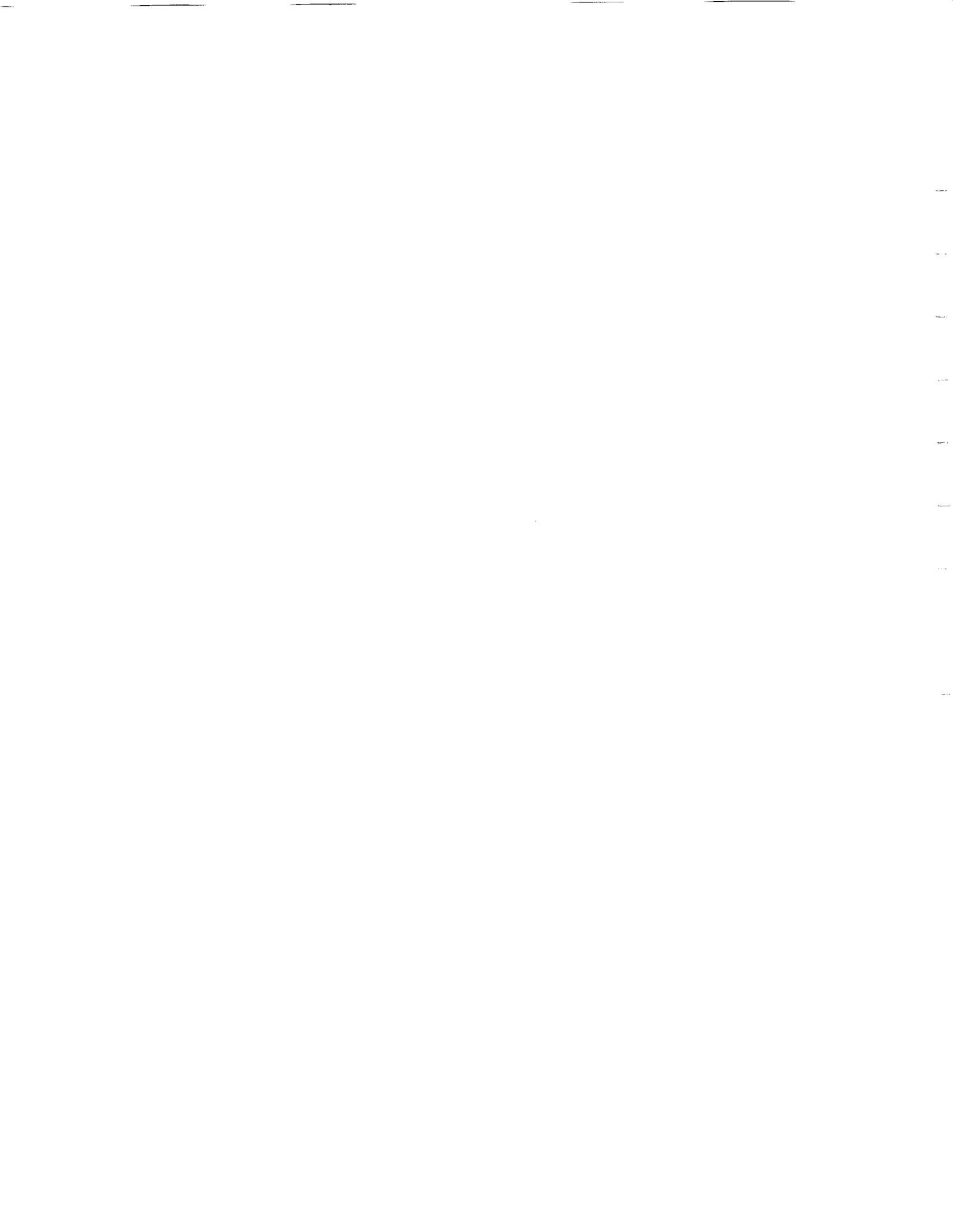
Forward Emergency Operations Center	Don Cornell	FEMA
Emergency Operations Facility	Bob Trojanowski	NRC
Emergency News Center	Jim Sutch Al Lookabaugh	ANL ANL
Dose Assessment	Rick Buttons	EPA
Radiological Monitoring Field Teams	George Goforth Eddie Fuente Tom Trout	ANL ANL FDA

#### BURKE COUNTY

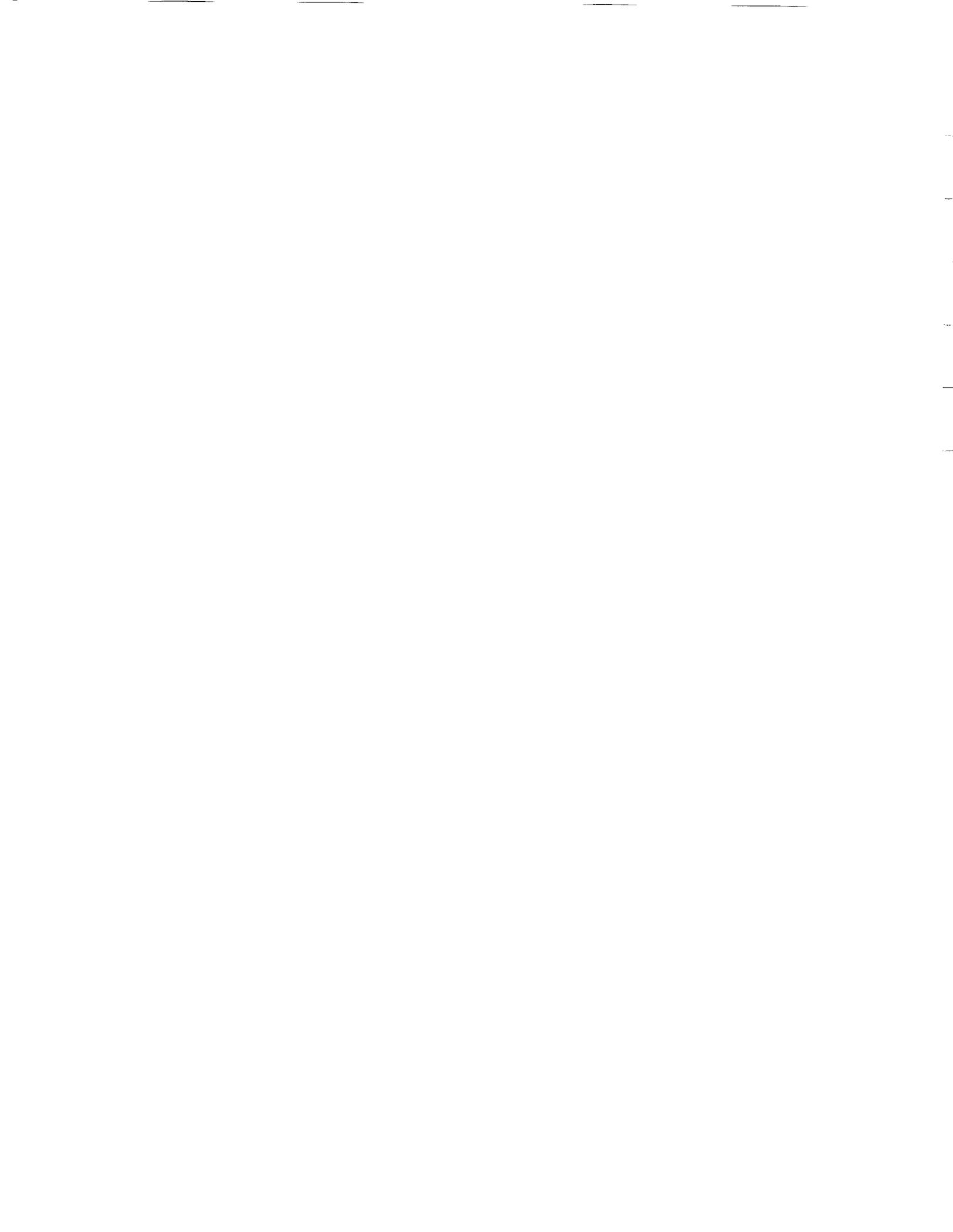
Emergency Operations Center	Conrad Burnside	FEMA
Traffic Control Points	Josh Moore	ANL

#### STATE OF SOUTH CAROLINA

Emergency Operations Center	Joe Canoles	FEMA
Dose Assessment	Bernie Hannah	ANL
LP-1 Radio Station WBBQ	Larry Robertson	FEMA



State TCP (Aiken County)	Al Hall	ANL
<b>AIKEN COUNTY</b>		
Emergency Operations Center	Tom Reynolds	FEMA
Reception Center/Congregate Care	Virginia Baker	ANL
Emergency Worker Decontamination	Al Hall	ANL
Traffic Control Points	Al Hall	ANL
<b>ALLENDALE COUNTY</b>		
Emergency Operations Center	Robert Perdue	FEMA
Traffic Control Point	Dave Moffet	ANL
Reception Center/Congregate Care	Tom Carroll	ANL
Emergency Worker Decontamination	Tom Carroll	ANL
<b>BARNWELL COUNTY</b>		
Emergency Operations Center	Eddie Hickman	FEMA
Traffic Control Points	Dave Moffet	ANL
Emergency Worker Decontamination	Dave Moffet	ANL



## **APPENDIX 3**

### **EXERCISE OBJECTIVES AND EXTENT-OF-PLAY AGREEMENT**

This appendix lists the exercise objectives, which were scheduled for demonstration in the Vogtle Electric Generating Plant exercise on March 29, 2000 and the extent-of-play agreement approved by FEMA Region IV.





ROY E. BARNES  
GOVERNOR

OFFICE OF THE GOVERNOR  
**Georgia Emergency Management Agency**

P.O. Box 18055  
Atlanta, Georgia 30316-0055  
Tel: (404) 635-7000  
In Georgia 1-800-TRY- GEMA  
FAX: (404) 635-7205



GARY W. McCONNELL  
DIRECTOR

January 4, 2000

Mr. Don Cornell  
Training, Exercise and Evaluation Branch  
Federal Emergency Management Agency  
Region IV  
Suite 338  
3003 Chamblee - Tucker Road  
Atlanta, Georgia 30341

Dear Mr. Cornell:

Please find enclosed the ~~exercise~~ objectives to be demonstrated by the State of Georgia and Burke County, Georgia, for the Vogtle Electric Generating Plant Exercise that will be conducted March 29, 2000. Objectives denoted by a ✓, will be demonstrated.

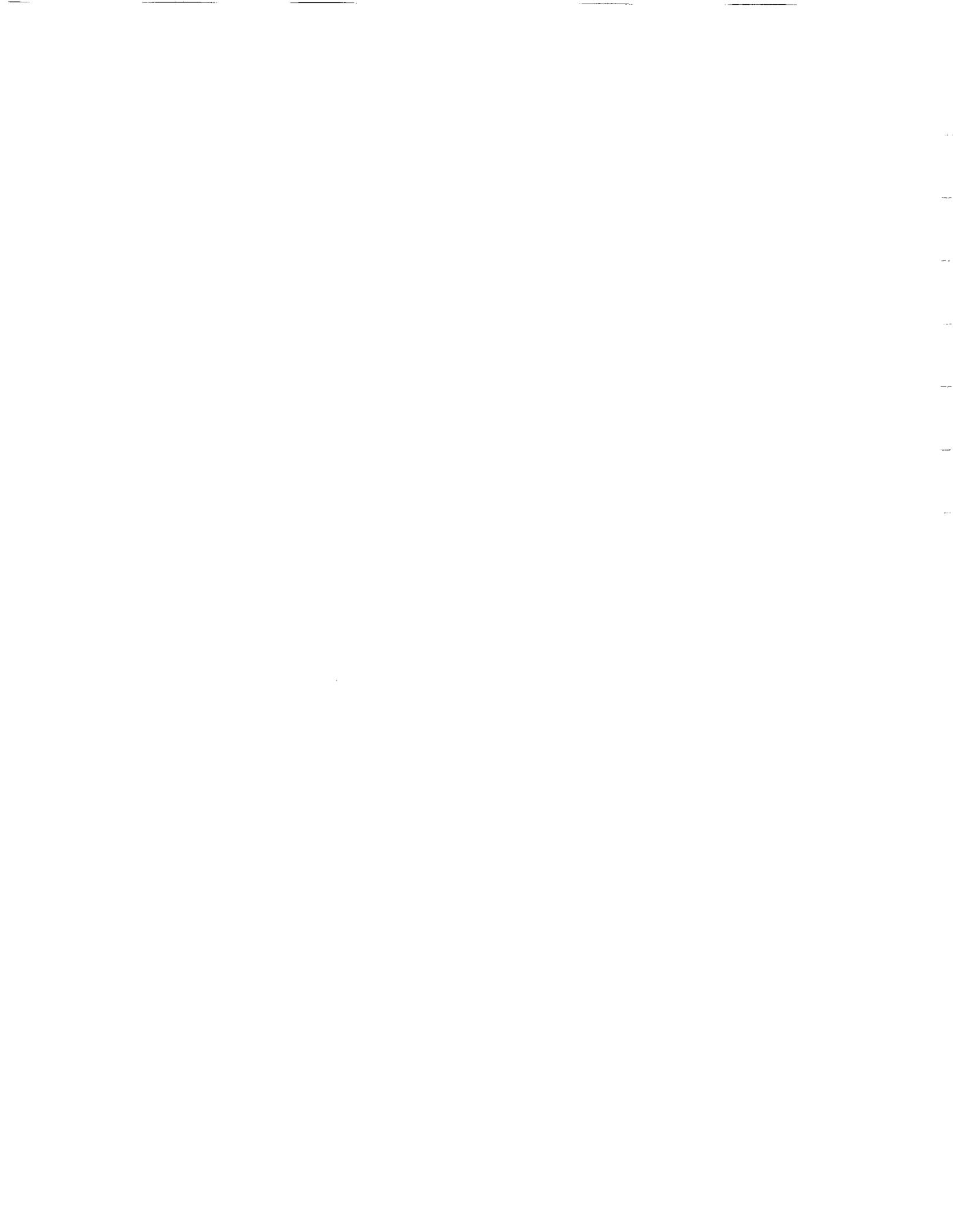
If you have any questions, please contact me at (404) 635-7233.

Sincerely,

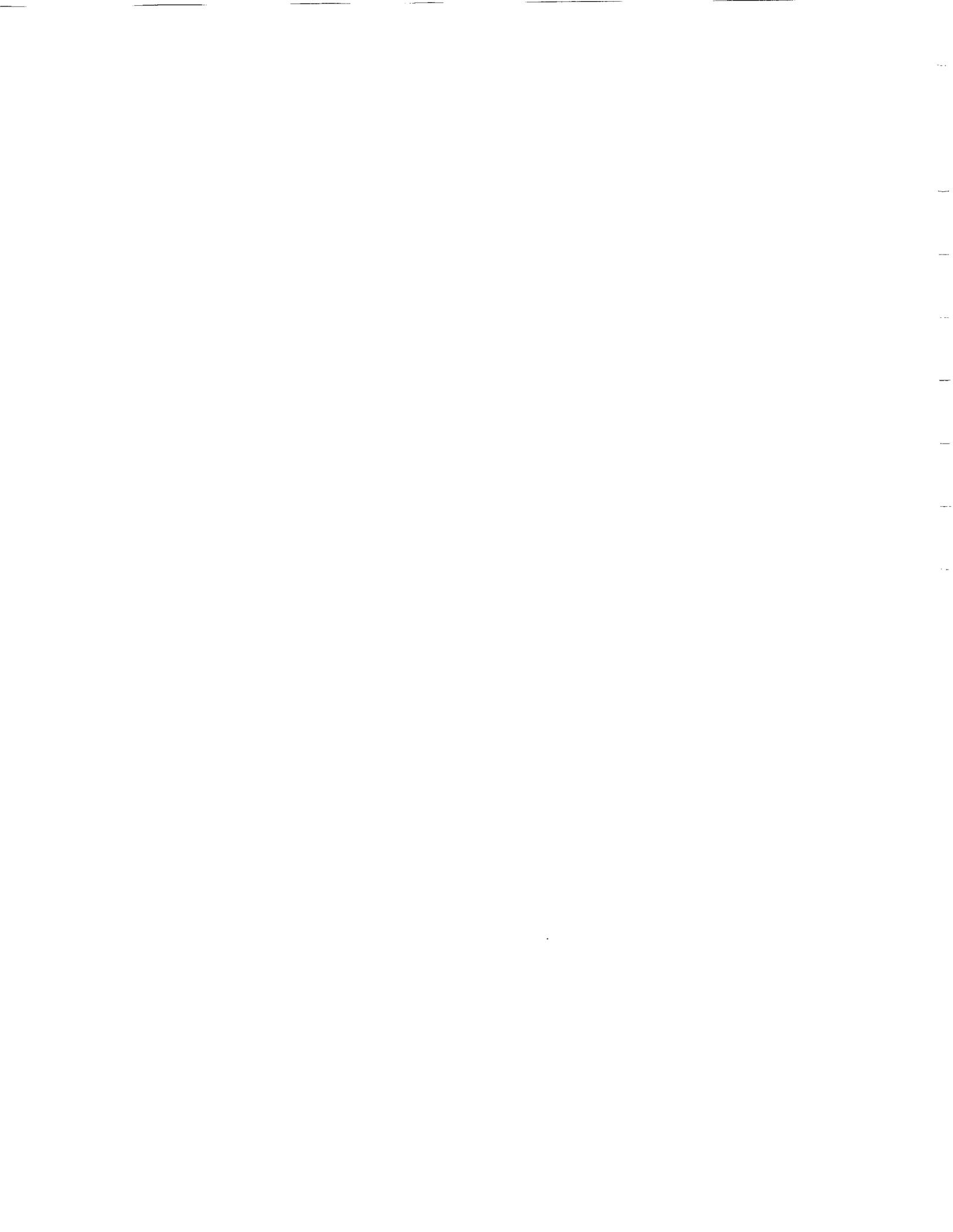
PATRICK COCHRAN  
Manager, Radiological and Hazardous Materials

Enclosure

cc: Chief Earl Porterfield, Burke County EMA  
Lawrence Mayo, Emergency Preparedness, Plant Vogtle  
Larry Robertson, FEMA, Region IV



<b>Plant Vogtle Exercise Objectives March 29, 2000</b>		<b>Group</b>	<b>State</b>	<b>Burke County</b>
1	Mobilization of emergency personnel	A	✓	✓
2	Adequacy of facilities & displays	A	✓	✓
3	Direction & Control of emergency	A	✓	✓
4	Communicate with all appropriate locations	A	✓	✓
5	Control emergency worker exposure	A	✓	✓
6	Demonstrate equipment & procedures to measure radiation	A	✓	
7	Dose projection	A	✓	
8	Measurement of radioiodine & particulates	A	✓	
9	Plume protective action decision making	A	✓	✓
10	Alert & notification	A	✓	✓
11	Public instruction & emergency information	A	✓	✓
12	Emergency information media	A	✓	✓
13	Emergency information rumor control	A	✓	
		<b>Group</b>		
14	Use of KI	B		
15	Protective Actions, Special Populations	B		✓
16	Protective Actions, Schools	B		
17	Traffic Control	B		✓
18	Reception center	B		
19	Congregate care	B		
20	Medical services - Transportation	B		
21	Medical services - Facilities	B		
22	Emergency worker decontamination	B		
		<b>Group</b>		
23	Other assistance	C	✓	
24	Post-emergency sampling	C		
25	Laboratory operations	C		
26	Project dosage via ingestion pathway	C		
27	Implementation of ingestion protective actions	C		
28	Relocation, re-entry, and return - decision making	C		
29	Relocation, re-entry, and return - implementation	C		
30	Continuous, 24-hour staffing	C		
31	Offsite support for the release of onsite personnel	C		
32	Unannounced exercise or drill	C		
33	Off-hours exercise or drill	C		





ROY E. BARNES  
GOVERNOR

OFFICE OF THE GOVERNOR  
**Georgia Emergency Management Agency**

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Atlanta, Georgia 30316-0055  
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In Georgia 1-800-TRY-GEMA  
FAX: (404) 635-7205



GARY W. McCONNELL  
DIRECTOR

January 6, 2000

Mr. Don Cornell  
Training, Exercise and Evaluation Branch  
Federal Emergency Management Agency  
Region IV  
Suite 338  
3003 Chamblee - Tucker Road  
Atlanta, Georgia 30341

Dear Mr. Cornell:

Please find enclosed the ~~Extent of Play~~ for the Vogtle Electric Generating Plant Exercise that will be conducted March 29, 2000.

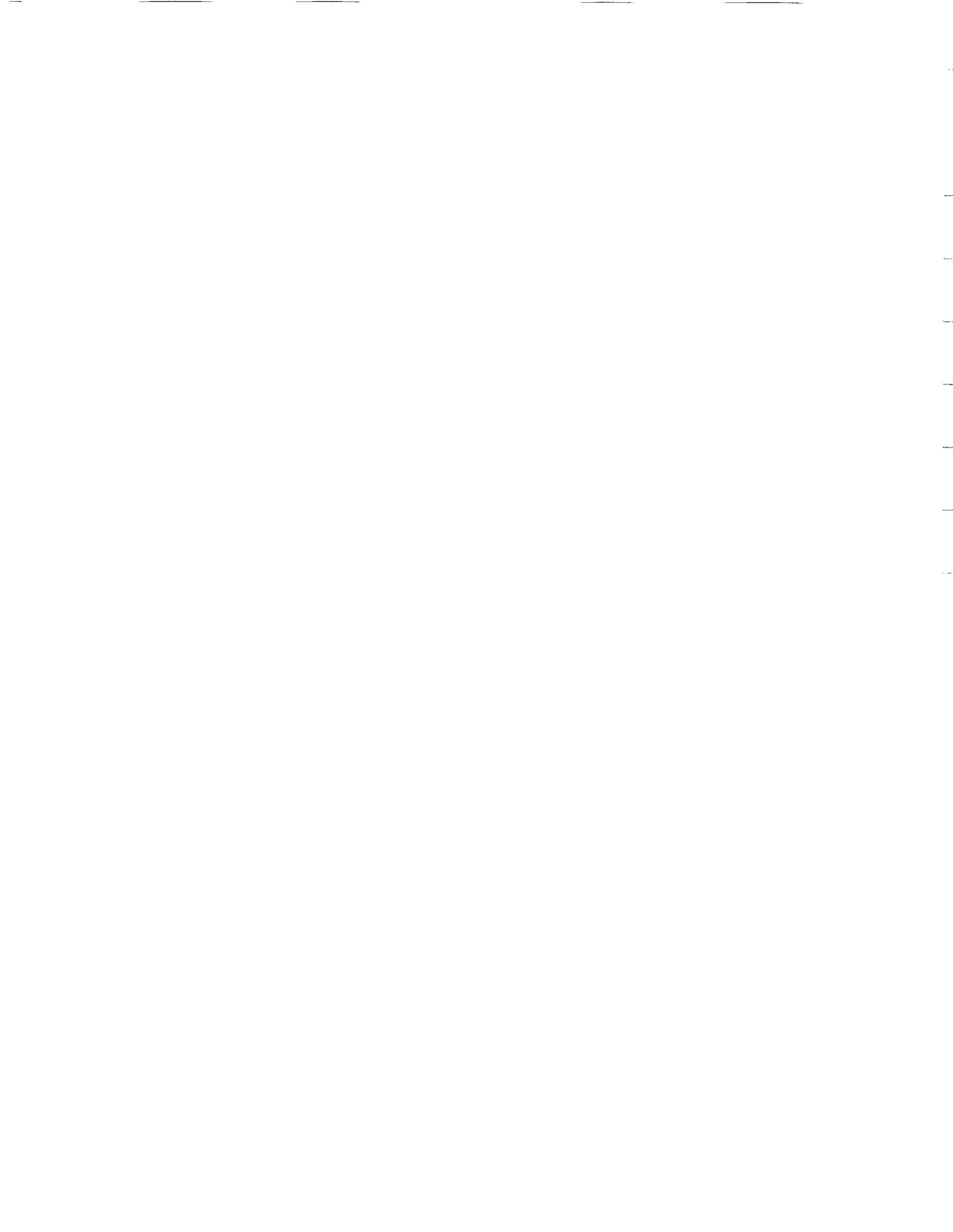
If you have any questions, please contact me at (404) 635-7233.

Sincerely,

PATRICK COCHRAN  
Manager, Radiological and Hazardous Materials

Enclosure

cc: Chief Earl Porterfield, Burke County EMA  
Lawrence Mayo, Emergency Preparedness, Plant Vogtle  
Larry Robertson, FEMA, Region IV



**Extent of Play  
Plant Vogtle Exercise  
March 29, 2000**

**Personnel**

State personnel will be pre-positioned in the Waynesboro, Georgia area.

**Areas Requiring Corrective Action from previous Evaluated Exercise**

Items in Objectives 5, 8 and 11 were identified as Areas Requiring Corrective Action (ARCA) during the Plant Vogtle Full Participation Exercise conducted on June 24, 1998.

**Objective 5, Issue Number: 68-98-05-A-02** This ARCA was corrected during the Plant Farley Evaluated Exercise on September 28, 1998. Verification of this correction is stated in a letter from Mr. Don Cornell to Mr. Gary McConnell, dated December 30, 1998.

**Objective 8, Issue Number: 68-98-08-A-03** Radiation Survey Instruments will be checked against a known radiation source to assure proper operation of the instrumentation. DNR/EPD Procedures will be closely followed to prevent overlooking a contamination control step during the re-assembly of the air sampler head on the air-sampling device.

**Objective 11, Issue Number: 68-98-11-A-01** Procedures have been reviewed and the message generation process revised to assure that correct information is promulgated by the FEOC PIO staff for inclusion in news releases. Credit has not been granted for correction of this issue, even though the ability for correction has been well demonstrated during two evaluated exercises at other facilities in the State of Georgia.

**MS-1 Drill**

Referencing the FEMA Policy Paper, effective October 1, 1999, issued and signed by Kay C. Goss and FEMA's position that the capabilities of offsite medical facilities and emergency medical services have been enhanced and are consistently demonstrated as adequate, the MS-1 Drill originating in Burke County and culminating at Doctor's Hospital, Augusta, Georgia will not be evaluated by FEMA during the March, 2000 Plant Vogtle exercise.

**Traffic Control Personnel**

Traffic control personnel will be interviewed at the Burke County Emergency Operations Center in Waynesboro, rather than in place at actual traffic control points.

**Post Exercise Meetings/Briefings**

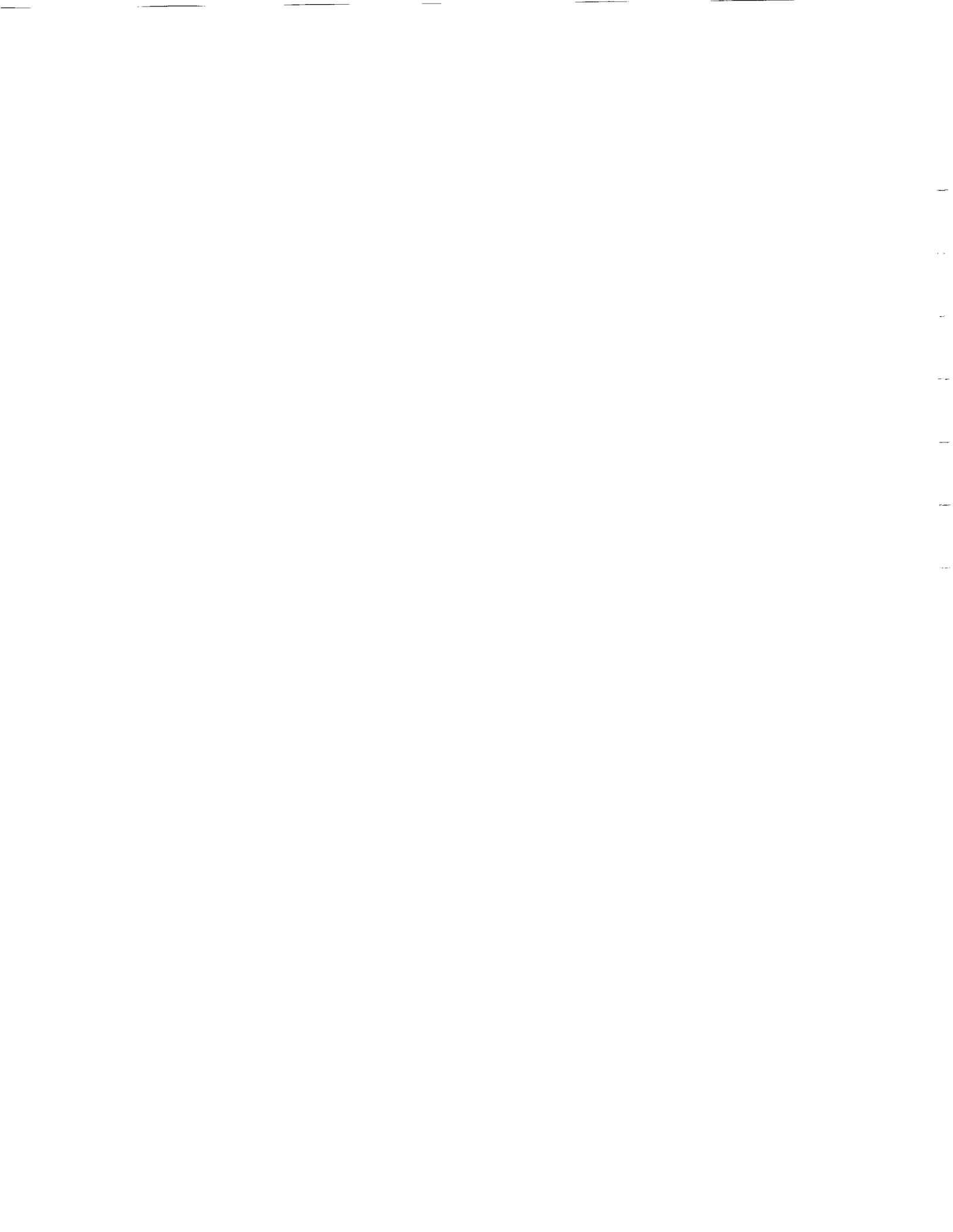
Meetings/Briefings will be held at:

County Office Park Auditorium, 715 West 6<sup>th</sup> Street, Waynesboro Georgia

GEMA / FEMA Issues Resolution Meeting (if necessary)- 10:00 am

Participants Critique - 12:00 noon

Public Meeting - 1:00 pm



The State of South Carolina  
Military Department



OFFICE OF THE ADJUTANT GENERAL

January 5, 2000

STANHOPE S. SPEARS  
MAJOR GENERAL  
THE ADJUTANT GENERAL

Mr. Joe Canoles, EMPS  
FEMA, Region IV  
Training, Exercise & Evaluation Branch  
3003 Chamblee-Tucker Road  
Atlanta, GA 30341

Dear Mr. Canoles:

In accordance with Section N, NUREG 0654, attached are the purpose, scope, exercise objectives, and boilerplate for the Vogtle Electric Generating Plant Radiological Emergency Preparedness Exercise to be conducted March 29, 2000.

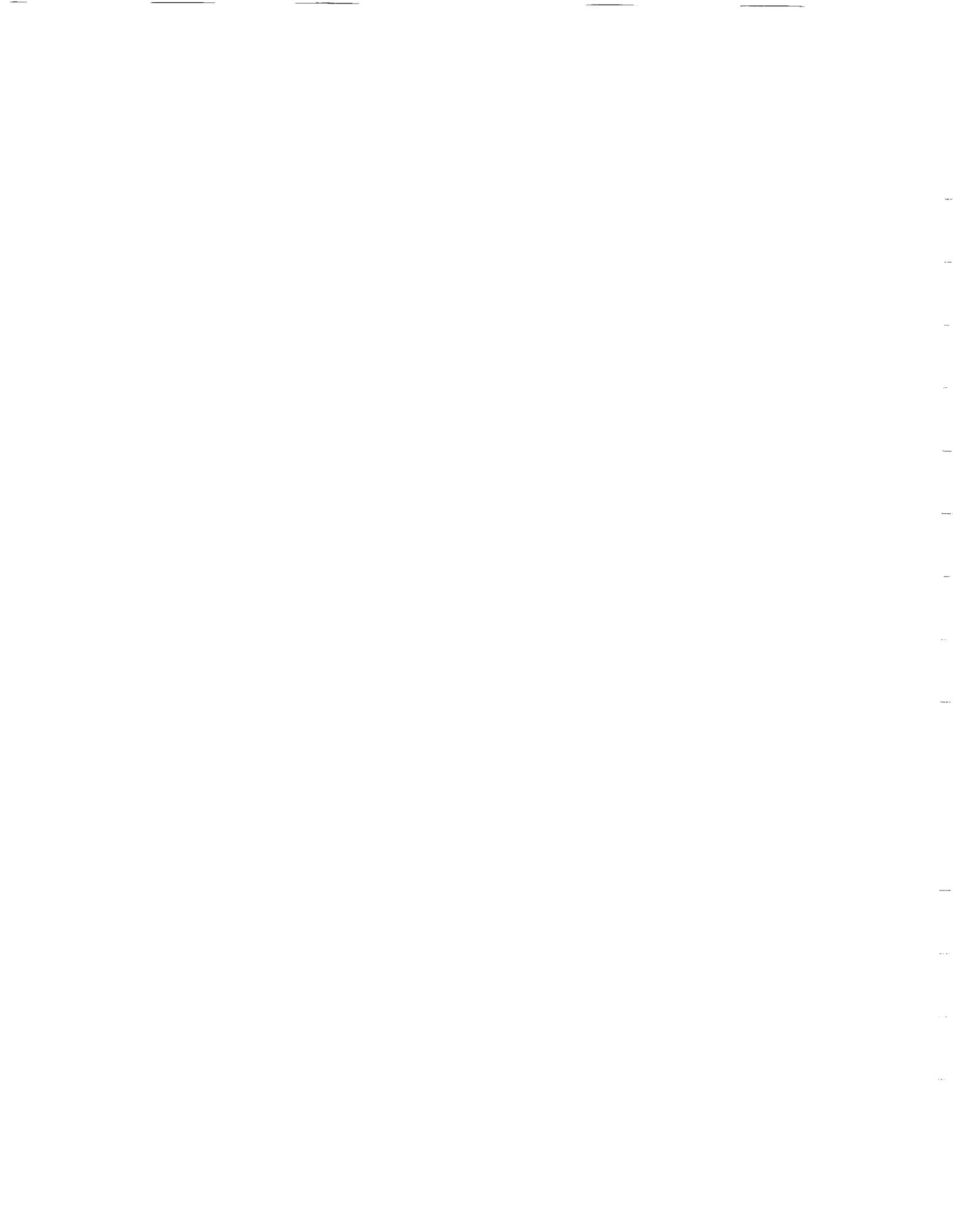
Questions should be directed to Bill Huckins or Mark Cannady, telephone (803) 734-8020.

Sincerely,

A handwritten signature in cursive script, reading "John N. Paolucci".

John N. Paolucci  
Chief of Response

JNP:WJH:bh



**VOGTLE ELECTRIC GENERATING PLANT  
PARTIAL PARTICIPATION EXERCISE  
March 29, 2000**

**I. PURPOSE:**

- A. The purpose of this exercise is to demonstrate the state and local emergency organizations' ability to protect the lives and property of the citizens residing, working, or traveling within the plume exposure pathway emergency planning zone (EPZ) in case of a radiological mishap at the Vogtle Electric Generating Plant (VEGP).**
- B. The exercise will demonstrate the affected counties' ability to work efficiently with the utility and the States of South Carolina and Georgia under emergency conditions. Federal evaluators will observe the strengths and weaknesses of the emergency response forces. Such observations will form a basis for improvement of resources, plans and performance of the participating agencies.**

**II. SCOPE:**

- A. The State of South Carolina and affected South Carolina counties will demonstrate FEMA REP 14 exercise objectives outlined in the attachment. Some objectives will be demonstrated out-of-sequence from the scenario due to scheduling and volunteer worker considerations. A complete list of such events will be furnished to all controllers and evaluators prior to the exercise.**
- B. The State of South Carolina will activate the State Forward Emergency Operations Center (FEOC) at the South Carolina Army National Guard Armory, Graniteville, SC with sufficient staff for direction and control and all necessary support for the counties to achieve their objectives.**
- C. Liaison personnel, controllers, public information personnel, and a simulation cell simulating selected State Emergency Response Team (SERT) members will be pre-positioned.**

**III. PARTICIPANTS WILL INCLUDE:**

- A. Designated State Agency Players: Office of The Adjutant General, Emergency Preparedness Division; Department of Health and Environmental Control, Bureau of Land and Waste Management; and Department of Social Services.**

- B. Simulation cell: Department of Health and Environmental Control, Division of Emergency Medical Services; Department of Mental Health; Department of Natural Resources , Law Enforcement; Department of Public Safety, Highway Patrol; State Law Enforcement Division; and Office of the Adjutant General.
- C. Other Participants:
  - 1. The counties of Aiken, Allendale and Barnwell.
  - 2. The State of Georgia.
  - 3. Vogtle Electric Generating Plant.
  - 4. American Red Cross.
  - 5. Department of Energy - Savannah River Site
- IV. Sheltering for Aiken, Allendale and Barnwell citizens will be demonstrated by Aiken and Allendale counties. Barnwell County citizens will be sheltered in Allendale County.

Attachment: Objectives

# ATTACHMENT 1: Vogtle Electric Generating Plant REP Exercise Objectives, 2000

SITE: <u>VEGP</u>										
STATE: <u>SOUTH CAROLINA</u>	<i>STATE</i>	<i>AIKEN</i>	<i>ALLENDALE</i>	<i>BARNWELL</i>						
EX DATE: <u>March 29, 2000</u>										
TYPE: <u>Partial</u>										
1 Mob Emerg Personnel	✓	✓	✓	✓					B I E N N I A L L Y	
2 Facil. / Equip. / Display	✓	✓	✓	✓						
3 Direction & Control	✓	✓	✓	✓						
4 Communications	✓	✓	✓	✓						
5 Emerg. Work Exposure Control	✓	✓	✓	✓						
6 Fld. Mon - Ambient										
7 Plume Dose Projection	✓									
8 Field Monitoring Iodine										
9 Plume Protective Action	✓	✓	✓	✓						
10 Alert / Notification	✓	✓	✓	✓						
11 Public Instr. / Emerg. Info.	✓	✓	✓	✓						
12 Emerg. Info - Media	✓	✓	✓	✓						
13 Emerg. Info - Rumor Control	✓	✓	✓	✓						
14 KI-Emer Wkr/Gen Population		✓	✓	✓				B D E P E N D A N T		
15 Special Population										
16 School										
17 Traffic Control	✓	✓	✓							
18 Reception Ctr-Reg/Mon		✓	✓							
19 Congregate Care		✓	✓							
20 Med Services Transport										
21 Med Services Facility										
22 Decon-Emer Wkr/Veh Equip		✓	✓	✓						
23 Supplementary Assistance	✓	✓	✓	✓				C O N C E V E R Y  6 Y E A R S		
24 Post Emergency Sampling										
25 Post Emergency Lab.										
26 IPZ-Dose Projection Prot Act										
27 IPZ-Prot Action Implementation										
28 RRR-Decision Making										
29 RRR-Implementation										
30 24 hr Capability - Shift Change										
31 Evac on-Site Personnel										
32 Unannounced Exercise										
33 Off-Hours Exercise										

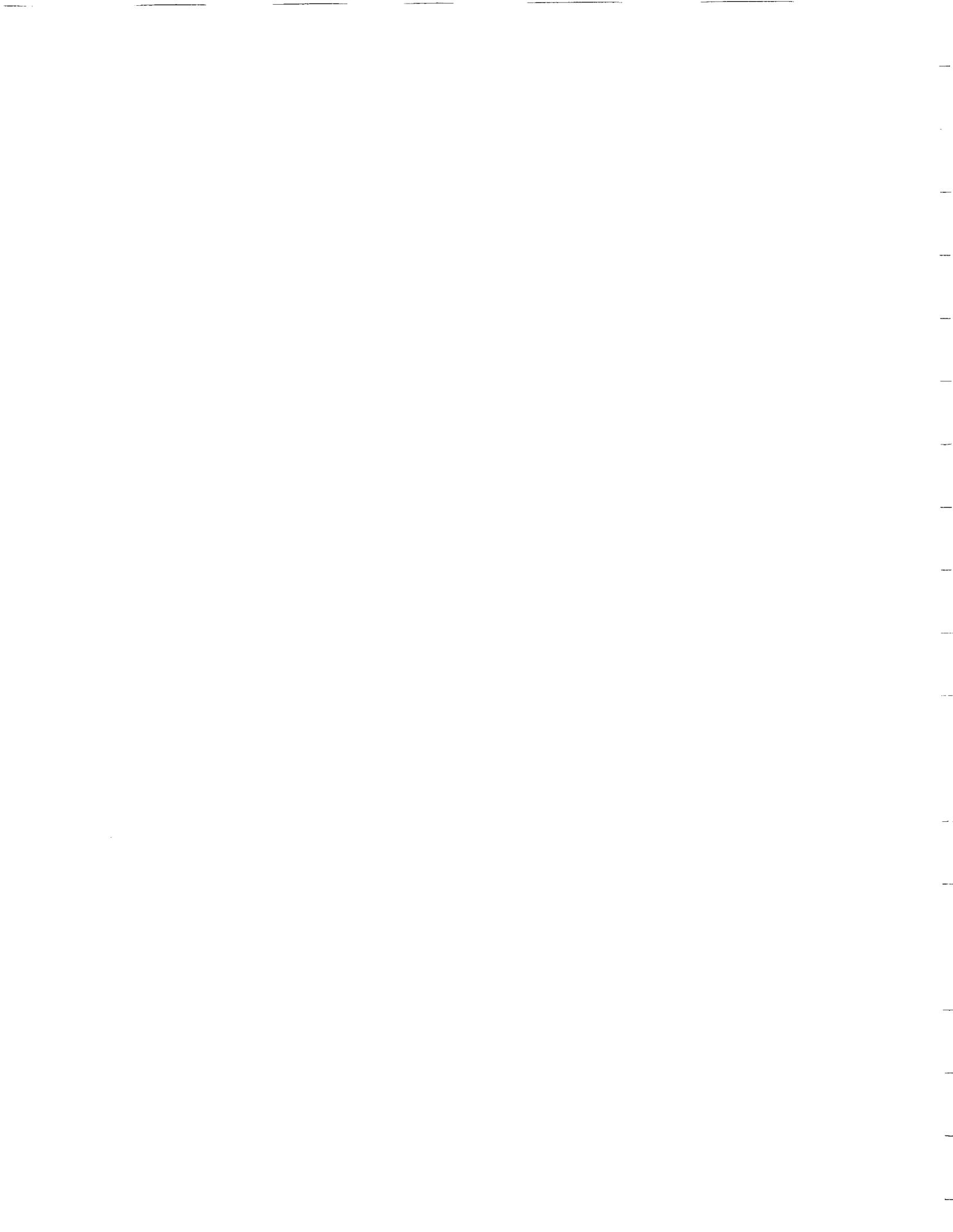


## **APPENDIX 4**

### **EXERCISE SCENARIO**

This appendix contains the Exercise Scenarios, which were used as the basis for invoking emergency response actions by OROs in the Vogtle Electric Generating Plant exercise on March 29, 2000.

These scenarios were submitted by the States of Georgia and South Carolina and approved by FEMA Region IV.





ROY E. BARNES  
GOVERNOR

OFFICE OF THE GOVERNOR  
**Georgia Emergency Management Agency**

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Atlanta, Georgia 30316-0055  
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In Georgia 1-800-TRY- GEMA  
FAX: (404) 635-7205



GARY W. McCONNELL  
DIRECTOR

January 12, 2000

Mr. Don Cornell  
Training, Exercise and Evaluation Branch  
Federal Emergency Management Agency  
Region IV  
Suite 338  
3003 Chamblee - Tucker Road  
Atlanta, Georgia 30341

Dear Mr. Cornell:

Please find enclosed two copies of the 2000 NRC Biennial Graded Exercise Scenario for the Vogtle Electric Generating Plant Exercise that will be conducted March 29, 2000.

If you have any questions, please contact Mr. Lawrence Mayo, Emergency Preparedness Coordinator for the Vogtle Project at 1-706-826-3356.

Sincerely,

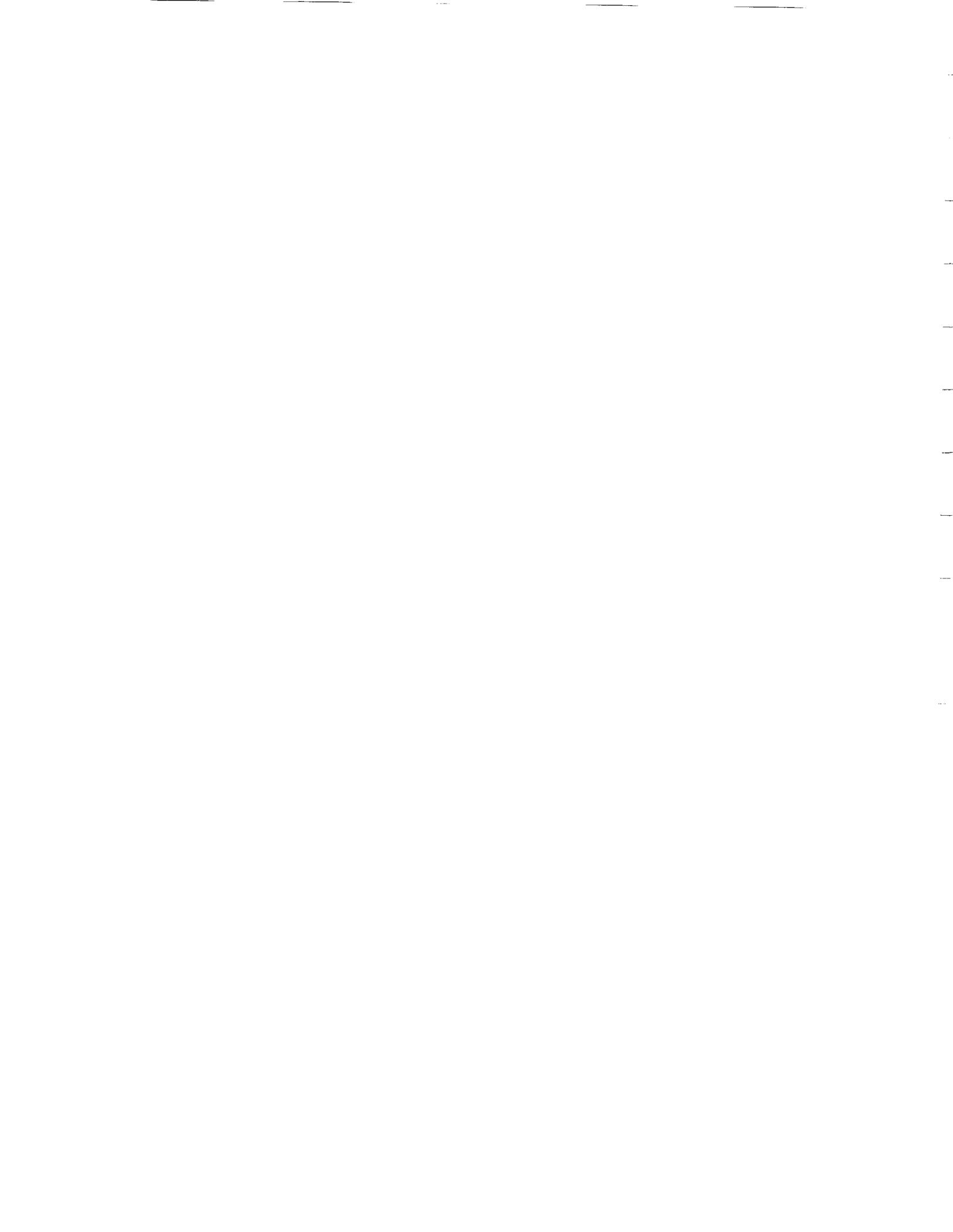
PATRICK COCHRAN

Manager, Radiological and Hazardous Materials

Enclosure

cc: Larry Robertson, FEMA, Region IV

Lawrence Mayo, Emergency Preparedness, Plant Vogtle, w/o enclosure



**2000 NRC BIENNIAL GRADED EXERCISE**  
**March 29, 2000**

**SCENARIO ABSTRACT**

The initial conditions have Units 1 and 2 at 100% power. Unit 1 is in a 72 hour LCO due to a problem with 1 Alpha diesel generator and 1 Alpha motor driven auxiliary feed water pump. All control systems are in automatic with Unit 1 at normal operating temperature and pressure. Unit 1 has been on line for 199 days.

The exercise scenario creates conditions for an off site release through the failure of the three fission product barriers. The sequence is initiated when Steam Generator #3 on unit 1 develops a 10 GPM tube leak. (Release to the environment begins through the steam jet air ejector, normal RCS radioactivity). Ten minutes after the 10 GPM leak starts, the steam generator tube ruptures, resulting in a 500 GPM Reactor Coolant System (RCS) leak. The steam generator tube rupture (SGTR) requires a manual reactor trip and a safety injection (SI). The 1 Bravo diesel generator fails to start. An Alert Emergency is declared due to a *“Non-Isolable RCS leak (including SG leakage) GREATER THAN the capacity of one CCP in normal charging mode.”* Upon declaration of the Alert Emergency, the Emergency Response Data System (ERDS) is initiated, the TSC and OSC are activated, and the EOF is brought to standby. Assembly and accountability are actually performed.

About 5 minutes after the Alert declaration a report is received that two individuals are contaminated and possibly injured. Search and rescue personnel are dispatched to the last known location (spent fuel pool) to render first aid. The injured person will exit the protected area via Burke County EMS approximately 35 minutes after the request for ambulance support.

**2000 NRC BIENNIAL GRADED EXERCISE**  
**March 29, 2000**

One hour after the alert declaration, a check valve from loop #4 RCS cold leg mechanically fails releasing loose parts into the RCS. This is followed by digital metal impact monitoring system (DMIMS) alarms. Engineering analyzes the DMIMS and reports multiple impacts in the reactor vessel lower plenum region. Fuel failure occurs due to the mechanical damage from the RCP check valve. Chemistry personnel confirm the fuel damage with sampling. A Site Area Emergency is declared due to "*Potential Loss of RCS barrier from the steam generator tube rupture and a Loss of a second barrier (fuel clad).*". The EOF is activated due to this declaration.

About an hour later, Steam Generator #3 main steam safety valve PSV 3021 fails open providing a release path to the environment. Field monitoring teams are dispatched to monitor the environment and locate the plume. A General Emergency is declared due to loss of three barriers. Protective action recommendations are made to state agencies. Field monitoring teams are dispatched to monitor the environment and locate the plume. About 45 minutes after the General Emergency is declared an OSC repair team gags the safety. The emergency will terminate after the safety is gagged.

**2000 NRC Biennial Graded Exercise  
March 29, 2000**

**SCENARIO TIME LINE**

<b><u>CLASS</u></b>	<b><u>TIME</u></b>	<b><u>EVENT</u></b>
	0900	Start Drill.
	0905	<p>Steam Generator #3 develops a 10 GPM tube leak.</p> <ul style="list-style-type: none"> <li>◆ Radiation Monitors 1RE-0724 &amp; 1RE-12839 (N-16 on steam line, blowdown and Steam Jet Air Ejector) show an increase.</li> <li>◆ Monitored off-site release to the environment starts (normal RCS activity &lt; .02 mrem at site boundary).</li> <li>◆ Simulator operators enter Abnormal Operating Procedures 18009-C, Steam Generator Tube Leak.</li> <li>◆ Chemistry personnel directed to enter 49009-C, HP/Chemistry Steam Generator Tube Leak Actions.</li> </ul>
	0915	<p>Steam Generator #3 tube leak increases to a tube rupture of 500 GPM.</p> <ul style="list-style-type: none"> <li>◆ Reactor manually tripped</li> <li>◆ Safety Injection (SI) initiated. Diesel Generator 1B fails to start.</li> <li>◆ Simulator operators enter Emergency Operating Procedures 19030-1, E-3 Steam Generator Tube Rupture and 19301-C, ES-3.1, Post-SGTR Cooldown Using Backfill</li> </ul>
<b>ALERT</b>	0930	<b>ALERT EMERGENCY</b> declared due to <i>“Non-Isolable RCS leak (including SG leakage) GREATER THAN the capacity of one CCP in normal charging mode.”</i>
	0935	Report that a worker has fallen into the unit 2 spent fuel pool, suffering a head injury. Rescued by a co-worker. (Both have internal and external contamination.)
	0936	Search and Rescue dispatched to last known location of injured/contaminated individuals.
	0939	Search and rescue locate injured/contaminated individuals and prepare the injured for transport to offsite medical facility.
	0953	Ambulance on-site.
	0955	Emergency Response Data System (ERDS) to the NRC activated.

**2000 NRC Biennial Graded Exercise  
March 29, 2000**

**SCENARIO TIME LINE**

<b><u>CLASS</u></b>	<b><u>TIME</u></b>	<b><u>EVENT</u></b>
	1000	Assembly and Accountability complete. Report of two missing personnel. TSC and OSC activated. Site Evacuation should be ordered at this time.
	1005	EOF at standby.
	1010	SI pump 1B trips due to breaker malfunction.
	1015	Check Valve 1-1204-086 (Injection line from Accumulator, Safety Injection or Residual Heat Removal to Loop 4 RCS Cold Leg) mechanically fails releasing loose parts to the RCS. <ul style="list-style-type: none"> <li>◆ DMIMS annunciator alarms due to multiple impacts in the lower plenum region.</li> <li>◆ Fuel Failure occurs due to mechanical damage. (1% clad damage)</li> <li>◆ Simulator Operators enter AOP 18039-C, Confirmed Loose Part in RCS or Steam Generator Secondary Side</li> </ul>
	1025	Area radiation levels in Containment and RCS Sample Area start to increase. Chemistry is directed to sample the RCS.
	1030	Engineering from TSC or Administration Building called to evaluate DMIMS Alarm in Simulator.
	1045	Fuel failure confirmed with chemistry results. (362 $\mu$ Ci/gm)
<b>SITE AREA</b>	1100	<b>SITE AREA EMERGENCY</b> declared due to <i>"Potential Loss of RCS barrier from the steam generator tube rupture and a Loss of a second barrier (fuel clad)."</i>
	1105	EOF activated.
	1105	SI pump 1B restored.
	1200	Main steam safety valve 1PSV-3021 lifts. <ul style="list-style-type: none"> <li>◆ Unmonitored off-site release starts via Steam Generator #3 steam supply.</li> </ul>
<b>GENERAL</b>	1215	<b>GENERAL EMERGENCY</b> declared due to <i>"Loss of three barriers"</i> . <ul style="list-style-type: none"> <li>◆ Protective Action Recommendations - Evacuate 2 miles in all directions, 5 miles down wind. Shelter the remainder of the EPZ.</li> </ul>

**2000 NRC Biennial Graded Exercise  
March 29, 2000**

**SCENARIO TIME LINE**

<b><u>CLASS</u></b>	<b><u>TIME</u></b>	<b><u>EVENT</u></b>
	1300	Safety is gagged by the OSC repair team.
	1315	Drill Terminated.



**2000 NRC BIENNIAL GRADED EXERCISE**  
**March 29, 2000**

**SCOPE**

To ensure that the health and safety of the general public is protected in the event of an accident at the Vogtle Electric Generating Plant (VEGP), Southern Nuclear Operating Company (SNC) conducts an biennial NRC graded emergency preparedness exercise. This exercise will be conducted on Wednesday, March 29, 2000, and evaluated by the NRC and FEMA.

The exercise involves mobilization of VEGP, SNC and Georgia Power Company (GPC) personnel and resources in response to simulated accident conditions. All VEGP on-site Emergency Response Facilities will be activated including the TSC, OSC, and EOF. The Simulator will be used in place of the actual Control Room. The Emergency News Center (ENC) in Waynesboro will be activated. Due to the compressed time line, some GPC participants will be pre-positioned. The General Office Operation Center in Birmingham will be operational to support on site activities. Exercise participants will not have prior knowledge of the exercise scenario accident condition to be simulated or radiological data. A semiannual health physics drill, annual medical drill, biennial communications drill, annual assembly and accountability drill and an annual radiological monitoring drill, will be conducted in conjunction with the exercise.

There will be full participation by the State of Georgia, State of South Carolina along with Aiken County, Allendale County, Barnwell County and Burke County. Savannah River Site will participate in the communications only. Georgia Emergency Management Agency (GEMA) and the South Carolina Emergency Preparedness Division (SC EPD) will activate their Forward Emergency Operations Center (FEOC). The Georgia Department of Natural Resources (DNR) will operate from the GEMA FEOC with DNR field monitoring teams in support of GEMA.

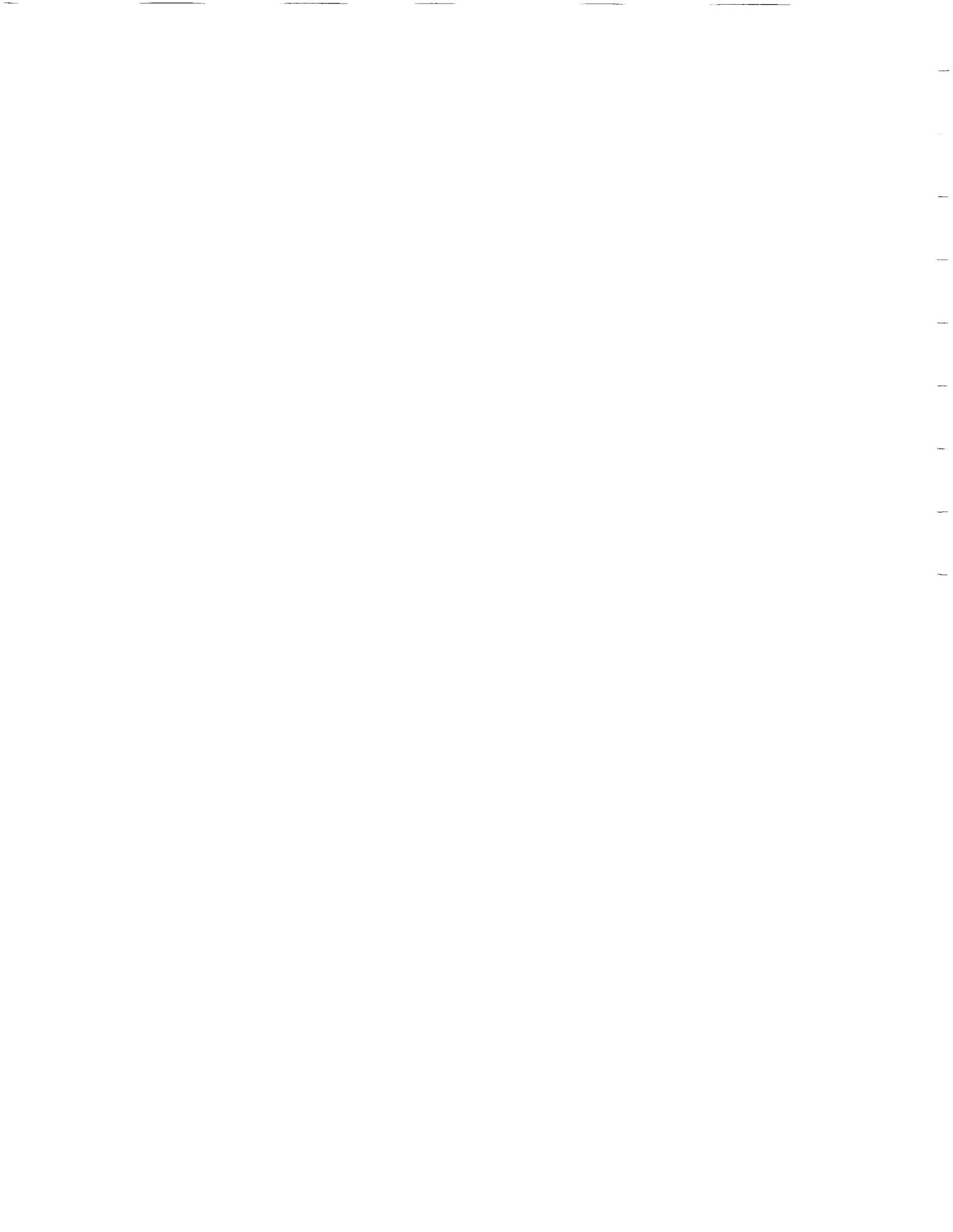
The Public Alerting System (Sirens and NOAA Weather Radio System) will be operationally tested on Wednesday, March 29 and a telephone survey will be conducted shortly after the conclusion of the exercise to determine the effectiveness of the system.



**NRC Graded Exercise  
March 29, 2000**

**METEOROLOGICAL DATA (15 Minute Avg.)**

	<u>SOX</u> 0930	<u>0931</u> 1000	<u>1001</u> 1030	<u>1031</u> 1100	<u>1101</u> 1130	<u>1131</u> 1200	<u>1201</u> 1230	<u>1231</u> 1300	<u>1301</u> 1330
<b>PRI MET TWR 10M Wind Speed - mph</b>	2	3	3	2	3	2	2	3	2
<b>PRI MET TWR 10M Wind Dir.</b>	40	48	36	41	45	40	37	41	40
<b>PRI MET TWR 10M Ambient Temp - Deg. F</b>	76	76	76.1	77.6	78.8	80.5	82.9	85.2	76
<b>PRI MET TWR 10M DEW PT Temp</b>	74	74	74	75	75	74	72	75	74
<b>PRI MET TWR 10M Sigma Theta</b>	12.8	13.0	12.9	12.5	13.8	12.8	12.9	12.7	12.8
<b>PRI MET TWR 60M Wind Speed - mph</b>	4	6	5	5	7	4	5	7	4
<b>PRI MET TWR 60M Wind Dir.</b>	41	42	39	40	41	38	39	40	41
<b>PRI MET TWR 60M Precipitation</b>	0	0	0	0	0	0	0	0	0
<b>PRI MET TWR 60-10M Delta Temp - Deg. F</b>	-1.39	-1.41	-1.35	-1.41	-1.45	-1.36	-1.40	-1.42	-1.39
<b>SEC MET TWR 10M Wind Speed - mph</b>	4	2	3	2	3	2	2	3	4
<b>SEC MET TWR 10M Wind Dir. - Deg.</b>	35	40	42	39	41	43	37	40	35
<b>SEC MET TWR Ambient Temp - Deg. F</b>	73.2	74	76.3	77.4	78.6	80.4	82.8	85	73.2
<b>SEC MET TWR 10M Sigma Theta</b>	11.9	13.2	14.5	13.9	14.2	12.9	13.6	14.8	11.9
<b>Stability Class</b>	C	C	C	C	C	C	C	C	C



**2000 NRC BIENNIAL GRADED EXERCISE**  
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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

The Vogtle Electric Generating Plant (VEGP) emergency preparedness exercise objectives are based on Nuclear Regulatory Commission (NRC) requirements provided in 10CFR50.47, "Emergency Plans," and 10CFR50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities." Additional guidance provided in NUREG-0654, FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans" was utilized in developing the objectives.

**A. Accident Assessment and Classification**

1. Demonstrate the ability to identify initiating conditions, determine emergency action levels (EAL) parameters and correctly classify the emergency throughout the exercise.

**Standard Criteria:** Determine the correct highest emergency classification level based on events which were in progress, considering past events, and their impact on the current conditions. This should be done within 15 minutes from the time the initiating condition(s) or EAL is identified.

**B. Notifications**

1. Demonstrate the ability to alert, notify and mobilize site emergency response personnel.

**Standard Criteria:** Complete checklist 1, Plant Page Announcement, 91002-C, "Emergency Notifications" and perform the announcement within 5 minutes of the initial event classification for an Alert or higher. There is no standard for upgrade announcements.

2. Demonstrate the ability to expeditiously notify state, local and federal authorities (NRC) of emergency conditions.

**Standard Criteria:** Transmit checklist 2 of procedure 91002-C, "Emergency Notifications" completed through item #3 of Notification form within 15 minutes of event classification (recorded in item #6) for an initial notification of states and local authorities. Method: Voice

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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

Transmit checklist 2 of procedure 91002-C, "Emergency Notifications" completed through item #3 within 60 minutes of last transmittal for a follow-up notification to state and local authorities. Method: Voice or facsimile with voice confirmation.

Transmit information using checklist 3 of procedure 91002-C, "Emergency Notifications" within 60 minutes of event classification for an initial notification of the NRC. Method: Voice

3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions.

**Standard Criteria:** Complete checklist "A" of procedure 91704-C, "Actions For Security During A Radiological Emergency" within 15 minutes of notification (via plant page or telephone) from control room.

4. Demonstrate the capability of the Prompt Notification System for the public to operate properly when required.

**Standard Criteria:** Sirens: 90% of the sirens operate properly as indicated by the Whelen feedback system. NOAA Tone Alert Radios: A NOAA Tone Alert Radio is activated.

**C. Emergency Response**

1. Demonstrate the capability to direct and control emergency operations.

**Standard Criteria:** Subjective evaluation of the command and control demonstrated by the Control Room in the early phase and the TSC in the latter phase of the emergency. In general there should be positive control of teams sent out to investigate and make repairs of equipment. Priorities should be established and necessary personnel made aware of the priorities. The TSC should be aware of the status of the plant and marshal resources to mitigate the consequences of the emergency situation.

2. Demonstrate the ability to transfer emergency direction from the Control Room (simulator) to the Technical Support Center (TSC) and from the TSC to the Emergency Operations Facility (EOF) in a timely manner.

**2000 NRC BIENNIAL GRADED EXERCISE**

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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

**Standard Criteria:** Subjective evaluation of briefings that were conducted prior to turnover responsibility. Personnel documented transfer of duties per procedure 91101-C, "Emergency Response Organization" and 91102-C, "Duties Of The Emergency Director" when required.

3. Demonstrate the ability to prepare for around the clock staffing requirements.

**Standard Criteria:** Complete 24-hour staff assignments per procedures 91203-C, "Activation And Operation Of The Emergency Operations Facility" and 91106-C, "Duties Of The TSC Support Coordinator".

4. Demonstrate the ability to perform assembly and accountability in a timely manner.

**Standard Criteria:** Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement. There should be 10 or fewer personnel missing for accountability to be considered satisfactory.

5. Demonstrate the ability to notify and obtain assistance from appropriate outside support organizations.

**Standard Criteria:** Obtain ambulance and/or fire fighting assistance when required.

**D. Emergency Response Facilities**

1. Demonstrate timely activation of the TSC, Operations Support Center (OSC), and EOF.

**Standard Criteria:**

**TSC and OSC Activation**

The TSC and OSC should be activated within about an hour of the initial notification.

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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

**EOF Activation**

The Emergency Operations Facility will be capable of being activated within about an hour of the initial notification of a Site Area emergency or higher declaration.

Initial notification during normal working hours is the plant page announcement of the declaration of the Emergency. Initial notification after normal working hours is the time the last person that is necessary to activate the facility is notified by the emergency recall system.

Activation time in any situation shall not be greater than 90 minutes from event declaration.

2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the TSC, OSC, EOF, and Emergency News Center (ENC).

**Standard Criteria:**

**Adequacy of the Emergency Equipment**

Subjective evaluation of the adequacy of the emergency equipment in the emergency response facilities. Generally, there should be sufficient lighting, ventilation, and equipment (copiers, administrative supplies, procedures, maps, drawings, etc.) to support efficient operations of the staff assigned to the emergency facilities.

**Adequacy of the Security Provisions**

The Security Shift Captain should implement and follow procedure 91704-C, "Actions For Security During A Radiological Emergency".

**Adequacy of Habitability Precautions**

The Health Physics Supervisor (TSC) should implement procedure 91110-C, "Duties Of The Health Physics Supervisor (TSC)", Health Physics Supervisor Checklist, Subsequent Actions, In-Plant Radiological Assessment after an onsite/offsite release has occurred.

The Dose Assessment Manager should implement the Dose Assessment Manager checklist of procedure 91203-C, "Activation And Operation Of The Emergency Operations Facility", Subsequent Actions, step 13.

3. Demonstrate the adequacy of communications for all emergency support resources.

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**Standard Criteria:** The emergency response communications listed in procedure 91204-C, "Emergency Response Communications" were available and operational. The communications systems were tested in accordance with TSC, OSC, and EOF Activation Checklists. The ERF personnel were able to operate all specified communication systems. Clear and timely communications links were established and maintained for the duration of the exercise.

**E. Radiological Assessment and Control**

1. Demonstrate the ability to obtain onsite radiological surveys and samples.

**Standard Criteria:** HP Technicians should demonstrate the ability to obtain appropriate instruments (range and type) and take surveys. In addition airborne samples should be taken when the conditions indicate the need for the information. Contamination or smear surveys may also be required if the scenario conditions warrant.

2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers.

**Standard Criteria:** Emergency workers should be issued self reading dosimeters when radiation levels require and exposure should be controlled to 10CFR20 limits unless the ED authorizes emergency limits. Exposure records should be available, either from the ALARA computer or a hard copy dose report. Emergency workers include Security and personnel within all emergency facilities. Issuance of self-reading dosimeters is not required in the TSC or the Control Room.

3. Demonstrate the ability to assemble and deploy field monitoring teams in a timely manner.

**Standard Criteria:** One Field Monitoring team should be ready to be deployed within 1 hour of being requested from the OSC, and no later than 90 minutes from the declaration of an Alert or higher emergency.

4. Demonstrate the ability to satisfactorily collect and disseminate field team data.

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**Standard Criteria:** Field data to be collected is dose rate or cpm from the plume, both open and closed window, and air sample gross/net cpm for particulate and iodine, if applicable. Satisfactory dissemination is from the field team to the Dose Assessment Manager via the field team communicator and field team coordinator.

5. Demonstrate the ability to develop dose projections and determine appropriate protective actions.

**Standard Criteria:** Dose projections from the dose assessment computer code should be compared to procedure 91305-C, "Protective Action Guidelines" to determine appropriate protective action recommendations for the public. On site protective actions will normally be determined by direct measurement of the environment.

6. Demonstrate the ability to make the decision whether to issue radio-protective drugs, KI, to emergency workers

**Standard Criteria:** KI should be taken if the estimated dose to the thyroid will exceed 25 REM CDE.

7. Demonstrate the adequacy of procedures for monitoring and decontamination of emergency workers.

**Standard Criteria:** Personnel should follow standard Health Physics procedures for monitoring and decontamination of personnel.

8. Demonstrate the use of equipment and procedures for the collection and transportation of samples from areas that receive deposition from the airborne plume. Samples should include soil, vegetation, and water as appropriate.

**Standard Criteria:** Personnel should follow standard Health Physics procedures for sampling in addition to procedure 91303-C, "Field Sampling And Surveys".

**F. Medical**

1. Demonstrate the ability to respond to and treat a contaminated injured individual.

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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

**Standard Criteria:** The emergency first aid team should arrive on medical scene within 10 minutes of notification (plant emergency beeper 911 activation). Within 2 minutes after arrival the team should perform basic ABC's. The team should evaluate for radiological contamination after the medical evaluation assessment. The team should properly package the injured individual for offsite transportation if required. Proper communications with the Control Room and or the OSC should be maintained for the duration of the exercise.

2. Demonstrate the adequacy of ambulance and hospital facilities and procedures for handling contaminated injured individuals.

**Standard Criteria:** Partially subjective evaluation of facilities, equipment and procedures for treating contaminated injuries while minimizing the spread of contamination. In general, the ambulance should arrive on site in a timely manner (30 minutes) after the TSC calls for off-site assistance. Transportation to Burke County Hospital should be  $\pm 25$  minutes and to Augusta Regional Medical Center  $\pm 45$  minutes, depending on traffic and road conditions. At the hospital, the Radiological Emergency Area (REA) should be completely prepared, including availability of protective clothing and dosimetry, and the staff completely assembled prior to patient arrival. Proper turnover between ambulance staff and REA staff should take place, including medical and radiological reports. The patient should receive medical and radiological evaluations from the REA staff, following proper sampling and decontamination norms. Exit of the patient and staff from the REA should follow standard norms for radiological survey, decontamination, and disposition of survey and dosimetry results. Actions of the plant HP tech who accompanies the patient to the hospital should be in accordance with sub-paragraphs 12-25 of First Aid Team Checklist, Subsequent Actions, Decontamination Not Possible, Hospitalization Required, Procedure 91307-C, "Contaminated Injury".

**G. Public Information**

1. Demonstrate the capability to coordinate the development and dissemination of clear, accurate and timely information to the news media.

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**EMERGENCY EXERCISE OBJECTIVES AND STANDARDS**

**Standard Criteria:** At least one press release should be developed for each emergency class within 60 minutes of the emergency notification. The press release should be accurate and coordinated with appropriate agencies when the ENC is activated with those agencies that are present at the ENC.

2. Demonstrate the capability to establish and effectively operate rumor control in a coordinated manner.

**Standard Criteria:** Calls should be returned in a timely manner with the correct information.

**H. Evaluation**

1. Demonstrate the ability to conduct a post-exercise critique to determine areas requiring improvement and corrective action.

**Standard Criteria:** An exercise timeline should be developed followed by an evaluation of the objectives. Significant problems in achieving the objectives should be discussed to ensure understanding of why the objective was not fully achieved. Recommendations for improvement in non-objective areas should also be discussed.

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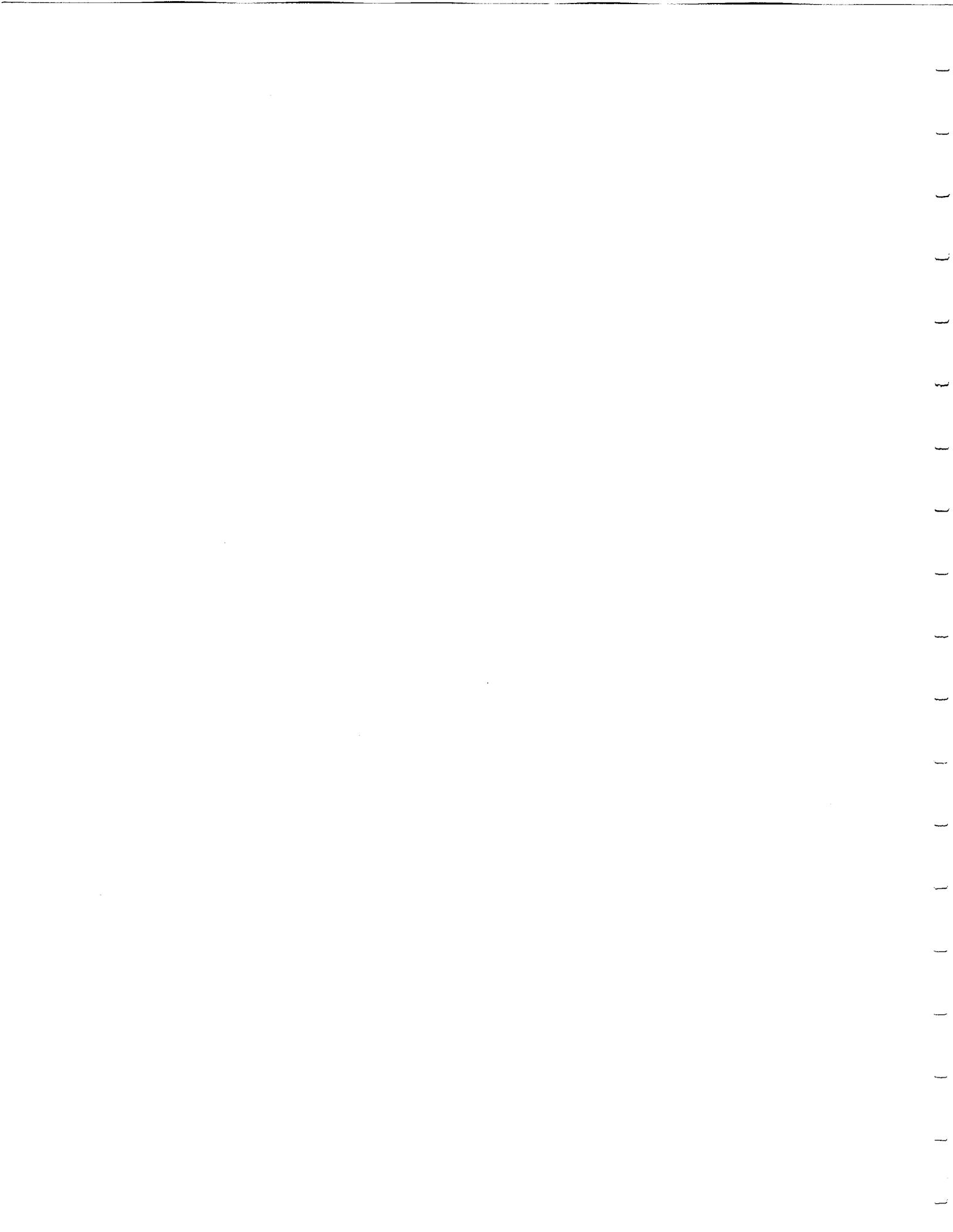
**PARTICIPATING AGENCIES**

**I. SOUTHERN NUCLEAR OPERATING COMPANY/GEORGIA POWER COMPANY**

- A. Plant Vogtle
  - 1. Emergency Operations Facility (EOF)
  - 2. Technical Support Center (TSC)
  - 3. Operations Support Center (OSC)
  - 4. Simulator
- B. General Office Operations Center (GOOC)
- C. Emergency News Center (ENC)

**II. OFFSITE**

- A. Savannah River Site (SRS) - Communications only
- B. South Carolina Emergency Preparedness Division (SC EPD) - Communications, EOF Representative, ENC Representative and FEOC activation
- C. Aiken County - Communications and EOC activation
- D. Barnwell County - Communications and EOC activation
- E. Allendale County - Communications and EOC activation
- F. South Carolina Department of Health and Environmental Control (DHEC) - EOF Representative
- G. Georgia Emergency Management Agency (GEMA) - Communications, EOF Representative, ENC Representative and FEOC activation
- H. Department of Natural Resources - GEMA FEOC, Field Monitoring Teams and EOF representatives
- I. Burke County EMA - Communications and EOC activation
- J. Nuclear Regulatory Commission (NRC) - EOF Representatives, TSC Representatives, GEMA FEOC Representatives, and ENC Representatives



**The State of South Carolina  
Military Department**



**OFFICE OF THE ADJUTANT GENERAL**

**STANHOPE S. SPEARS  
MAJOR GENERAL  
THE ADJUTANT GENERAL**

February 2, 2000

Mr. Joseph E. Canoles, EMPS  
Training, Exercise and Evaluation Branch  
FEMA, Region IV  
3003 Chamblee-Tucker Road  
Atlanta, GA 30341

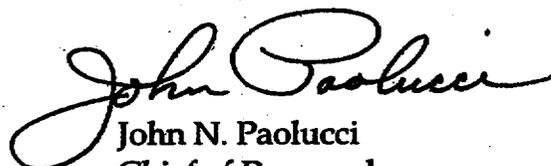
Dear Mr. Canoles,

Enclosed are the narrative scenario, sequence of events and out-of-sequence events message injects for the South Carolina portion of the Vogtle Electric Generating Plant (VEGP) Biennial Radiological Emergency Preparedness Exercise, scheduled for March 29, 2000.

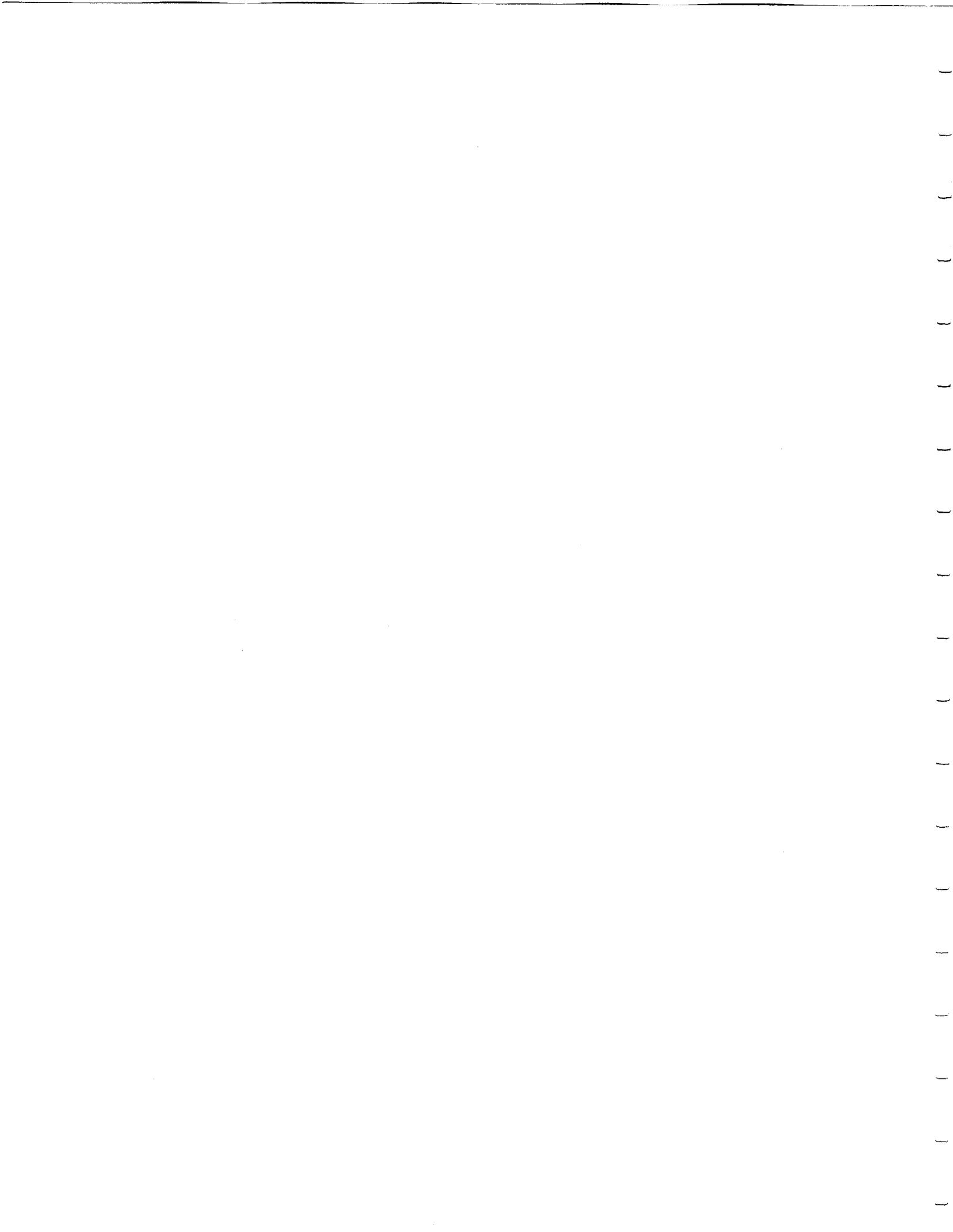
The VEGP point of contact is Mr. Lawrence Mayo, (706) 724-0654.

If you need further information, please contact Bill Huckins or Mark Cannady of our office at (803) 734-8020.

Sincerely,

  
John N. Paolucci  
Chief of Preparedness

Enclosure  
JNP:WJH:bh



## 2000 NRC BIENNIAL GRADED EXERCISE

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### SCENARIO ABSTRACT

The initial conditions have Units 1 and 2 at 100% power. Unit 1 is in a 72 hour LCO due to a problem with 1 Alpha diesel generator and 1 Alpha motor driven auxiliary feed water pump. All control systems are in automatic with Unit 1 at normal operating temperature and pressure. Unit 1 has been on line for 199 days.

The exercise scenario creates conditions for an off site release through the failure of the three fission product barriers. The sequence is initiated when Steam Generator #3 on unit 1 develops a 10 GPM tube leak. (Release to the environment begins through the steam jet air ejector, normal RCS radioactivity). Ten minutes after the 10 gallons per minute (GPM) leak starts, the steam generator tube ruptures, resulting in a 500 GPM Reactor Coolant System (RCS) leak. The steam generator tube rupture (SGTR) requires a manual reactor trip and a safety injection (SI). The 1 Bravo diesel generator fails to start. An Alert Emergency is declared due to a *"Non-Isolable RCS leak (including SG leakage) GREATER THAN the capacity of one Centrifugal Charging Pump in normal charging mode."* Upon declaration of the Alert Emergency, the shift superintendent will implement the emergency plan implementing procedures and assume the position of the Emergency Director. Offsite notifications will include the warning points for the states of Georgia and South Carolina and the counties Burke, Allendale, Aiken, and Barnwell. Savannah River Site (SRS) operation center will also receive notification. Other activities that will occur include the activation of the Emergency Response Data System (ERDS), the Technical Support Center (TSC), Operational Support Center (OSC), General Office Operations Center (GOOC) and the Emergency Operations Facility (EOF) is brought to a standby. Assembly and accountability are actually performed.

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The South Carolina State Warning Point (SWP) notifies Department of Health and Environmental Control (DHEC), and verifies notification of Aiken, Allendale and Barnwell counties, and notifies EPD Operations Officer. DHEC assesses the situation with the plant, confirms with EPD, and recommends response required. Key personnel are notified, the State Forward Emergency Operations Center (FEOC) is activated and the affected county Emergency Operations Centers (EOCs) are brought to stand-by status. Command and Control are assumed by EPD personnel at the FEOC, pre-positioned. The Public Information Group is dispatched to the Georgia Emergency News Center, pre-positioned. EPD notifies the Office of the Governor, Office of the Adjutant General (OTAG), North Carolina and FEMA.

Affected counties bring alert and notification systems to standby status and notify Host Counties of Alert Status.

About 5 minutes after the Alert declaration a report is received that two individuals are contaminated and possibly injured. Search and rescue personnel are dispatched to the last known location (spent fuel pool) to render first aid. The injured persons will exit the protected area via Burke County EMS approximately 35 minutes after the request for ambulance support.

One hour after the alert declaration, a check valve from loop #4 RCS cold leg mechanically fails releasing loose parts into the RCS. This is followed by digital metal impact monitoring system (DMIMS) alarms. Engineering analyzes the DMIMS and reports multiple impacts in the reactor vessel lower plenum region. Fuel failure (approximately 1%) occurs due to the mechanical damage from the Reactor Coolant Pump (RCP) check valve. Chemistry personnel confirm the fuel damage with sampling. A Site Area Emergency is declared due to "*Potential Loss of RCS*

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*barrier from the steam generator tube rupture and a Loss of a second barrier (fuel clad).". The EOF is activated due to this declaration.*

The South Carolina FEOC and county EOCs are promptly notified. EPD verifies county notification, DHEC assesses the situation with the plant and confirms with EPD. DHEC/EPD recommend protective actions to the Office of the Governor. Governor considers declaring a State of Emergency. EPD relays protective actions to the affected South Carolina counties and coordinates the activation of the sirens (fixed and mobile) with Aiken and Barnwell counties and the plant. The Prompt Notification System is coordinated with Aiken, Allendale and Barnwell counties. EAS messages are coordinated with Aiken, Allendale and Barnwell counties and EAS radio stations. Barnwell County siren and the Jackson Fire Department (Aiken County) route alerting are simulated. EPD considers activation of the Dosimetry Redistribution Plan. DHEC/SCEPD recommend if Potassium Iodide should be distributed to emergency workers. Traffic control points are established. Evacuation of G-10 and H-10 planning zones is considered. EPD considers evacuation of lakes, rivers and forests.

About an hour later, Steam Generator #3 main steam safety valve PSV 3021 fails open providing a release path to the environment. Field monitoring teams are directed to monitor the environment and locate the plume. A General Emergency is declared due to loss of three barriers. The Emergency Director will notify the states, the four counties and SRS. Protective action recommendations are made to state agencies.

EPD verifies county notification and DHEC assesses the situation with the plant. DHEC coordinates with EPD recommended protective actions. DHEC/EPD recommend areas requiring evacuation and/or sheltering, if required, to the Office of the Governor. EPD obtains the

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Governor's order for evacuation and/or sheltering, if required, and relays the Governor's decision to affected counties. GEMA coordinates Prompt Notification System activation with FEOC. The FEOC coordinates with Aiken; Allendale and Barnwell counties; Burke County, Georgia; and the plant. EPD notifies FEMA and NC. Periodic press releases occur.

Alerting of persons boating on the Savannah River is accomplished by the Georgia Department of Natural Resources, Game and Fish Division, and Burke County EMA, in coordination with the SC Department of Natural Resources, Law Enforcement. Savannah River Site officials notify plant workers and members of the public within site boundaries (simulated).

EPD notifies NC and FEMA. EPD coordinates evacuation, sheltering and radiological monitoring; provides periodic press updates for the public; coordinates and allocates state resources; and requests federal support as needed. EPD/DHEC consider administration of KI to emergency workers.

Aiken and Allendale counties activate their Reception Centers/Shelters as needed.

Aiken and Barnwell counties conduct evacuation and/or sheltering as ordered by the Governor, off-site radiological monitoring and decontamination as required, provide security for the evacuated area, and direct protective actions as recommended and deemed appropriate.

About 45 minutes after the General Emergency is declared an OSC repair team gags the safety. The emergency will terminate after the safety is gagged and the exercise lead controller has determined that the emergency response organization has had the opportunity to meet all objectives.

