



FEMA

Final Exercise .Report

H. B. Robinson Steam Electric Plant

Licensee: **Progress Energy**

Exercise Date: **October 7, 2003**

Report Date: **January 12, 2004**

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I. EXECUTIVE SUMMARY

On October 7, 2003, a full participation exercise was conducted in the plume exposure emergency planning zone (EPZ) around the H. B. Robinson Steam Electric 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 conducted 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 October 9, 2001. The qualifying emergency preparedness exercise was conducted on March 11-12, 1981.

FEMA wishes to acknowledge the efforts of the many individuals in the State of South Carolina, the Risk Counties of Chesterfield, Darlington and Lee and the Host County of Florence who participated in this exercise. Protecting the public health and safety is the full-time job of some 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.

This report contains the evaluation of the biennial exercise and the evaluation of a Medical Service Drill that was conducted on October 8, 2003.

The State and local organizations demonstrated knowledge of their emergency response plans and procedures and the ability to implement them. No Deficiencies or Areas Requiring Corrective Action (ARCA) were identified. Although DHEC dispatched a mobile laboratory to the Darlington National Guard Armory. The mobile laboratory served as an intermediate screening station for samples. This laboratory did not demonstrate the capabilities of a radiological laboratory. The capability will be demonstrated during the January 2004, Oconee Exercise. The ARCA concerning the direction and control of field teams identified during the V. C. Summer Exercise was corrected.

II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for offsite planning and response for nuclear power plants. FEMA's activities are conducted pursuant to Title 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.

Title 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 the 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 RERPs 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 NRC pursuant to the Memorandum of Understanding between the NRC and FEMA (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 Agriculture,
 - Department of Commerce,
 - Department of Energy,
 - Department of Health and Human Services,
 - Department of the Interior,
 - Department of Transportation,
 - Environmental Protection Agency,
 - Food and Drug Administration and
 - Nuclear Regulatory Commission.

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 H. B. Robinson Steam Electric Plant to FEMA Region IV by the State of South Carolina and involved local jurisdictions occurred on February 13, 1981. Formal approval of the RERP was granted by FEMA on December 29, 1981, under Title 44 CFR 350.

A REP exercise was conducted on October 7, 2003, by FEMA Region IV, 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 H. B. Robinson Steam Electric Plant. The purpose of this report is to present the exercise results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

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

The criteria utilized in the FEMA evaluation process 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;
- Exercise Evaluation Methodology, April 25, 2002.

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 ARCAs assessed during this exercise, recommended corrective actions, and the State and local governments' response, 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 October 7, 2003, exercise to test the offsite emergency response capabilities in the area surrounding the H. B. Robinson Steam Electric Plant.

A. Emergency Planning Zone Description

The H. B. Robinson Steam Electric Plant is located west of the Lake Robinson Dam in western Darlington County. The facility is owned and operated by Progress Energy.

In operation since March 1971, the H. B. Robinson Steam Electric Plant has one pressurized water reactor. The reactor, Unit No. 2, has an electric power generating capacity of approximately 700 megawatts.

Portions of Darlington, Lee and Chesterfield Counties are located in the plume exposure pathway. The land use within the Emergency Planning Zone (EPZ) is primarily agriculture. The City of Hartsville lies within the 10-mile EPZ. The total population for the EPZ is 32,550. There are eleven emergency response planning areas within the EPZ.

Major parks include portions of the Carolina Sand Hills National Wildlife Refuge and the Sand Hills State Forest. The Lynches and Pee Dee Rivers are fed from watersheds draining through the probable affected area.

Over the facility, the prevailing winds are from the southwest and shift primarily from southwest to northwest. The greatest probability for an accident with off-site implications would affect Darlington County.

CSX railway passes next to the plant. A spur is utilized for delivery of coal to an adjoining coal burning electrical generating plant.

B. Exercise Participants

The following agencies, organizations, and units of government participated in the H. B. Robinson Steam Electric Plant exercise on October 7, 2003.

STATE OF SOUTH CAROLINA

Department of Health and Environmental Control,
Bureau of Land Waste Management
Department of Natural Resources
Department of Social Services
Office of the Adjutant General,
Emergency Preparedness Division

South Carolina Highway Patrol

RISK JURISDICTIONS

Chesterfield County
Darlington County
Lee County

HOST JURISDICTION

Florence County

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross
Carolina Pines Regional Medical Center
Radio Amateur Civil Emergency Service (RACES)
WJMX Radio Station

C. Exercise Timeline

Table 1, on the following page, presents the time at which key events and activities occurred during the H. B. Robinson Steam Electric Plant exercise on October 7, 2003.

Table 1. Exercise Timeline

DATE AND SITE: October 7, 2003 - H. B. Robinson Steam Electric Plant
(Time That Notification Was Received or Action Was Taken)

Emergency Classification Level or Event	Time Utility Declared	SEDC	EOSE	JIC	CHESTERFIELD COUNTY	DARLINGTON COUNTY	LEE COUNTY	FMIS
Unusual Event	0713	0722			0722	0725		
Alert	0812	0819			0822	0819	0824	
Site Area Emergency	0939	0956	0954		0952	1000	0935	
General Emergency	1039	1052	1040		1052	1048	1050	1059
Sheltered	0843	0920	0819		0805	1001	0830	
Rad. Release Started	1032		1110					
Standard Rad. Release Terminated	On going						On going	
Facility Declared Operational	0830		0915		0827	0830	0915	
Declaration of State of Emergency Start	0854		0920		0900	0905	1132	
Break					0911	0905	N/A	
Exercise Terminated	1233	12	1212	1220	1144	1144	1144	1144
Early Preliminary Actions: School Evac. Lake Cleaning, Dusting & hosing outdoor					0830-School Evac	0832	1007	
1st Protective Action Decision Alert Public	0929				1009	0954	1009	
Sheltered	1015				1015	1015	1018	
1st Siren Activation	1018				1018	1018	1020	
1st EAS Message								
2nd Protective Action Decision Evacuate A-0-B-1-B-2-C-1-C-2	1110			1115	1106	1016	1112	
Shelters D-1, D-2, A-1, A-2, E-1, E-2								
Livestock Feed and Water	1126			1130	1120	1018	1121	
2nd Siren Activation	1123			1123	1223	1018	1121	
3rd EAS Message					1009	0956	1009	
Kit EW & Instructionalized	1000							

IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities, which participated in the October 7, 2003 exercise to test the offsite emergency response capabilities of State and local governments in the 10-mile EPZ, surrounding the H. B. Robinson Steam Electric Plant.

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in the exercise evaluation methodology published in the Federal Register, April 2002. Detailed information on the exercise evaluation criteria 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, presents the status of all Exercise Evaluation Criteria, which were scheduled for demonstration during this exercise by participating jurisdictions and functional entities. Exercise criteria are listed by number and the demonstration status of those criteria 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 of Exercise Evaluation

DATE AND SITE: October 7, 2003 – H. B. Robinson Steam Electric Plant

ELEMENT/Sub-Element	SEDC	JC	DHEC	EOF	EPH	CHESTERFIELD COUNTY	DARLINGTON COUNTY	J.B.C. COUNTY	FLORENCE COUNTY
1. EMERGENCY OPERATIONS MANAGEMENT									
1.a.1. Mobilization	M	M	M	M		M	M	M	
1.b.1. Facilities	M	M	M	M		M	M	M	
1.c.1. Direction and Control	M	M	M			M	M	M	
1.d.1. Communications Equipment	M	M	M	M		M	M	M	
1.e.1. Equipment & Supplies to Support Operations	M	M	M	M		M	M	M	
2. PROTECTIVE ACTION DECISION MAKING									
2.a.1. Emergency Worker Exposure Control	M	M	M			M			
2.b.1. Rad Assessment & PABs & PADs Based on Available Info			M	M			M	M	
2.b.2. Rad Assessment and PABs and PADs for the General Public	M		M			M	M	M	
2.c.1. Protective Action Decisions for Special Populations									
2.d.1. Rad Assessment & Decision Making for Ingestion Exposure									
2.e.1. Rad Assessment & Decision Making for Relocation, Re-entry & Return									
3. PROTECTIVE ACTION IMPLEMENTATION									
3.e.1. Implementation of Emergency Worker Control	M	M	M			M	M	M	M
3.h.1. Implementation of PA Decisions									
3.e.1. Implementation of PADs for Special Populations									
3.e.2. Implementation of PADs for Schools									
3.d.1. Implementation of Traffic and Access Control	M					M	M	M	
3.d.2. Impediments to Evaluation and Traffic and Access Control	M					M	M	M	
3.e.1. Implementation of Ingestion Decisions Using Adequate Info									
3.e.2. Implementation of PA Decisions Showing Strategies and Instructional Materials									
3.f.1. Implementation of Relocation, Re-entry and Return Decisions									
4. FIELD MEASUREMENT and ANALYSIS									
4.a.1. Plume Phase Field Measurement & Analysis Equipment									
4.a.2. Plume Phase Field Measurement & Analysis Management			M						
4.a.3. Plume Phase Field Measurements & Analysis Procedures									
4.b.1. Post Plume Field Measurement & Analysis									
4.b.2. Laboratory Operations			M						
5. EMERGENCY NOTIFICATION & PUBLIC INFO									
5.a.1. Activation of Prompt Alert and Notification	M					M	M	M	
5.a.2. Activation of Prompt Alert and Notification 15-Minute/Fast Breaker									
5.a.3. Activation of Prompt Alert and Notification Backup Alert and Notification						M	M	M	
5.b.1. Emergency Info and Instructions for the Public and the Media	M	M			M	M	M	M	
6. SUPPORT OPERATIONS/FACILITIES									
6.a.1. Monitoring and Deton of Evacuees and CWs and Registration of Evacuees							M	M	M
6.b.1. Monitoring and Deton of Emergency Worker Equipment							M	M	M
6.c.1. Temporary Care of Evacuees								M	
6.d.1. Transport and Treatment of Contaminated/Injured Individuals									

LEGEND: M = Met D = Deficiency A = ARCA N# = Not Demonstrated

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 criteria 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 criteria 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 criteria 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 criteria 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 because corrective actions were 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.
- **Criterion Number** - A numeral, alpha, numeral combination corresponding to the criterion number in Exercise Evaluation Methodology dated April 2002.
- **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.

E, STATE OF SOUTH CAROLINA

1.1 State Emergency Operations Center

The State Emergency Operations Center (SEOC) is a modern facility with state of the art technology. The State's Emergency Management Director's participation enhanced the overall direction and control that was superbly executed by the Operations Chief and his staff. The Internet Routed Information System (IRIS), the State's emergency management tool, and the checklists that were followed at each Emergency Classification Level (ECL) enhanced a well-coordinated emergency response operation. Protective action recommendations (PAR) and decisions were timely and appropriate for the exercise. Alert and Notification of the public following the Site Area Emergency (SAE) and the General Emergency (GE) was well executed and performed with a sense-of-urgency.

- a. **MET:** Criteria 1.a.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 5.a.1, 5.a.3 and 5.b.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

1.2 Radiological Liaison

The Department of Health and Environmental Control (DHEC) shared the responsibility for the DHEC Emergency Response Coordinator between two individuals as they transitioned operations from the Farrow Road Command Center to the SEOC. The activation of the DHEC section at the SEOC was delayed because of the deployment of the field monitoring teams to the Forward Emergency Operations Center (FEOC). Prior to the Emergency Response Coordinator's arrival at the SEOC, the DHEC staff performed communication checks and supported SEOC operations. Communications and briefings were thorough and timely. The Emergency Response Coordinator routinely discussed radiological conditions, protective action strategy, and options with the SEOC Chief of Operations. Plant dose assessments were verified.

- a. **MET:** Criteria 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1 and 2.b.2
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

noted by a field team during the exercise, at least one communications system operated at all times which ensured contact with the Field Team Director. The Field Team Director provided plant status and plume release data to the field teams. He also directed field teams to sampling locations as well as coordinated pickup of field team samples to be returned to the mobile lab for processing.

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

1.4 Mobile Laboratory

The DHEC Mobile Radiological Laboratory (MRL) was deployed to the National Guard Armory in Darlington, South Carolina. DHEC demonstrated actual deployment of its field assets. The MRL served as an intermediate screening station for sample transfer because the instrumentation that DHEC sent forward only allowed for the screening of samples to determine the need for further analysis. The samples slated for further analysis would be transported to Columbia for analysis in the DHEC laboratory. The MRL staff members were all well versed on their procedures, radiation protection protocols and displayed a sense of purpose and professionalism. They did an excellent job in carrying out their duties.

- a. **MET: Criteria 1.e.1 and 3.a.1**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED :**

The criterion 4.c.1 extent-of-play states that the laboratory should be appropriately equipped to provide analyses of media, as requested on a timely basis, of sufficient quality and sensitivity to support assessments and decisions as anticipated by the ORO's plans and procedures. DHEC did not demonstrate this criterion. FEMA does not require a mobile laboratory but does require the demonstration of a capability to analyze samples. The instrumentation that DHEC sent forward only allowed for the screening of samples to determine the need for further analysis, i.e. a hot sample. The samples slated for further analysis would be transported to Columbia for analysis in the DHEC laboratory. DHEC has agreed to demonstrate the State's radiological laboratory capability during the January 2004 Oconee Exercise.

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

1.7 Joint Information Center

The professional staff in the JIC successfully demonstrated their capability to provide timely and accurate emergency information and instructions to the news media for broadcast to the public. Representatives from the State of South Carolina, Chesterfield, Darlington, Florence, and Lee Counties did a commendable job in coordinating and disseminating emergency information. The two news conferences were well organized and provided information consistent with the emergency status. The rumor control and public inquiry team handled 61 calls. Rumors were identified and addressed in a timely manner. The Public Inquiry Coordinator maintained constant information flow between the team and the JIC staff.

- a. MET: Criteria 1.a.1, 1.b.1, 1.e.1 and 5.b.1**
- b. DEFICIENCY: NONE**
- c. AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. NOT DEMONSTRATED: NONE**
- e. PRIOR ARCAs - RESOLVED: NONE**
- f. PRIOR ARCAs - UNRESOLVED: NONE**

1.8 LP-1 Radio Station WJMX

The staff of WJMX, the LP-1 Radio Station, demonstrated the capability to promptly broadcast Emergency Alert System (EAS) messages issued by the SEOC. SEOC staff communicated with the Program Director of WJMX by phone to confirm authentication codes, receipt of the test message, and the time of broadcast. EAS messages can be broadcast manually or automatically when the station is unmanned. Documentation of all test messages and the EAS Handbook are maintained in the broadcast room; backup power generation is in place. The staff was professional and supportive of the station's role in safeguarding the public.

- a. MET: Criterion 5.b.1**
- b. DEFICIENCY: NONE**
- c. AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. NOT DEMONSTRATED: NONE**

- a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.c.1, 5.a.1, 5.a.3 and 5.b.1
- b. **DEFICIENCY:** NONE.
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

2.1.2 Protective Actions for Schools

The Assistant Superintendent for Operations of the Chesterfield County School District participated in an interview pertaining to protective actions taken within the county school system in the event of an incident at the H.B. Robinson Steam Electric Plant. The three schools located in the 10-mile EPZ have emergency plans that supplement the District's Crisis Management Manual. Sufficient transportation was available to relocate the student and faculty population. Procedures are in-place to notify parents of a school evacuation in a timely manner. Each school principal was contacted during the exercise and two conducted practice evacuation drills. The School District is well prepared to safeguard students in their charge in the event of a potential or actual radiological release.

- a. **MET:** Criterion 3.c.2
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

2.1.5 Reception and Congregate Care

Volunteers from the American Red Cross (ARC), EMS personnel from First Health of Carolinas and amateur radio operators demonstrated all of the elements required to set up, monitor and conduct shelter operations. Monitoring of incoming evacuees was performed by the EMS personnel. The shelter manager oversaw shelter registration, communications, and evacuee needs. The participants in the exercise exhibited a thorough degree of training and had a high degree of compassion towards meeting the needs of the displaced evacuees.

- a. **MET:** Criteria 1.e.1, 3.a.1, 6.a.1 and 6.c.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCA_s - RESOLVED:** NONE
- f. **PRIOR ARCA_s - UNRESOLVED:** NONE

2.2 DARLINGTON COUNTY

2.2.1 Emergency Operations Center

The Director of Emergency Preparedness and the Special Programs Coordinator provided effective direction and control of the EOC. The competent and supportive staff knew their duties and performed them conscientiously. The Director of Emergency Services consistently coordinated with the State and other counties in the formulation and implementation of the evacuation and sheltering-in-place protective action decisions (PAD), activation of the sirens and issuing of EAS messages. The presence of the County Administrator, two County Councilmen, the utility and State liaison provided vital support to this successful operation. The WebEOC and GIS system continuously displayed significant information and events. This along with periodic EOC briefings, agency updates and the availability of computers for all EOC staff facilitated the flow of information. An impressive array of electronic status boards, fax machines, a variety of maps and other equipment supported this emergency response operation.

- a. **MET:** Criteria 1.a.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 5.a.1, 5.a.3 and 5.b.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE

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

2.2.4 Emergency Worker Decontamination

The Darlington County Fire District, Swift Creek Station, demonstrated emergency worker decontamination. The demonstration included a discussion on the issuance of permanent and direct-reading dosimeters, a sequential walkthrough for placing the Ludlum Model 3 survey meter into use and the activation of the Ludlum Model 52 portal monitor. All personnel were familiar with self-protective measures and actions to take regarding their exposure levels. The monitoring and decontamination area was well organized and the separation of clean versus contaminated personnel and equipment was demonstrated and/or thoroughly discussed. Personnel were knowledgeable of their responsibilities and provided proper responses to questions. All personnel acted professional and worked efficiently as a team.

- a. MET: Criteria 1.c.1, 3.a.1, 6.a.1 and 6.b.1
- b. DEFICIENCY: NONE
- c. AREAS REQUIRING CORRECTIVE ACTION: NONE
- d. NOT DEMONSTRATED: NONE
- e. PRIOR ARCAs - RESOLVED: NONE
- f. PRIOR ARCAs - UNRESOLVED: NONE

2.2.5 Lake Warning

Two South Carolina Department of Natural Resources (DNR) officers fully demonstrated their capability to perform lake warning operations. Darlington County issued the officers their dosimetry and an excellent radiation exposure handbook. The DNR officers were knowledgeable of radiological exposure control procedures and displayed an excellent knowledge of how to conduct lake warning and clearance. There was a prominent sign with warnings and instructions at the landing site.

Teamwork and contamination control were evident throughout this exercise. All participants are commended for their efforts during this outstanding exercise.

- a. **MET:** Criteria i.a.1, 1.c.1, 3.a.1, 3.b.1 and 6.d.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

23 LEE COUNTY

2.3.1 Emergency Operations Center

A professional, paid and volunteer staff operated the EOC. The Emergency Management Director effectively managed emergency operations. The EOC Director held frequent briefings with updates from the plant and, after the declaration of an SAE, included reports from the ESF representatives. Communications were monitored by the Deputy Fire Chief. The administrative assistant, who also maintained the status board, monitored the selective signaling system. The EOC Director, who maintained contact and coordination with the other counties and the State, made decisions.

- a. **MET:** Criteria 1.a.1, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 5.a.1, 5.a.3 and 5.b.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:** NONE
- f. **PRIOR ARCAs - UNRESOLVED:** NONE

2.3.4 Reception and Congregate Care Center

Members of the Lee County EMS and Fire Department successfully demonstrated radiological monitoring, decontamination, and registration facilities at Lee Central High School. Evacuees arriving were monitored and decontaminated along with their vehicles. EMS and Fire Department personnel described the actions taken to limit the spread of contamination. Monitoring staff explained the action levels for determining the need for decontamination for both vehicles and citizens. The procedures for handling evacuees and vehicles that could not be adequately decontaminated were explained. Evacuees and vehicles were registered according to established procedures.

The congregate care staff also demonstrated the capability to ensure evacuees were registered before entering the shelter. Stations for various services were set up (e.g., medical, mental services) according to plans, food and other materials were available.

- a. **MET:** Criteria 1.e.1, 3.a.1, 6.a.1 and 6.c.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCA_s - RESOLVED:** NONE
- f. **PRIOR ARCA_s - UNRESOLVED:** NONE

3. HOST JURISDICTION

3.1 FLORENCE COUNTY

3.1.1 Reception and Congregate Care

The Florence County Emergency Management Agency demonstrated monitoring, decontamination, registration, and care of evacuees at the Florence Civic Center. The Florence City Police and Fire Departments and EMS personnel supported the reception phase. The area layout and demonstrated actions were in accordance with plans and procedures. The congregate care center, supported by personnel from the ARC, South Carolina Department of Social Services and DHEC, was well staffed, organized, and able to meet the needs of the public. All personnel demonstrated an understanding of plans and procedures and are capable of performing required functions.

4. SUMMARY OF AREAS REQUIRING CORRECTIVE ACTION

4.1 PRIOR ARCAs RESOLVED

4.1.1 61-03-4.a.2-A-01 State of South Carolina Dose Assessment

Description: Field team management was inadequate in several respects. Additional staff members should have been assigned to the Field Team Director to assist in communications with the field team. This shortage of staff personnel resulted in the Field team Director having to communicate with the field team. This communication responsibility detracted from his ability to effectively conduct other duties. Additionally, reception problems with both radios and cell phones resulted in the inability to maintain timely and effective communications with the field team.

Because of these communications shortfalls, several problems resulted in the management of field team activities. Briefly, the field team misinterpreted a message to distribute KI, but rather team members ingested KI. Additionally, while the field team was advised to initiate radioiodine air sampling, the Field Team Director neglected to follow-up on the status of the air samples; consequently, no calculation of I-131 concentration from air samples was received.

Corrective Action Demonstrated: An additional staff member to support communications was assigned to the Field Team Director. There were no losses of communications during the exercise. Although communication "dead zones" were noted by a field team during the exercise, at least one communications system operated at all times which ensured contact with the Field Team Director. The Field Team Director provided plant status and plume release data to the field teams. He also directed field teams to sampling locations as well as coordinated pickup of field team

APPENDIX I

ACRONYMS AND ABBREVIATIONS

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

ARC	American Red Cross
ARCA	Area Requiring Corrective Action
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
DSS	Department of Social Services
EAL	Emergency Action Level
EAS	Emergency Alert System
ECL	Emergency Classification Level
EEM	Exercise Evaluation Methodology
EMA	Emergency Management Agency
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Extent of Play
EPA	Environmental Protection Agency
EPD	Emergency Preparedness Division
EPZ	Emergency Planning Zone
FAA	Federal Aviation Agency
FEMA	Federal Emergency Management Agency
FR	Federal Register
FMT	Field Monitoring Teams
GE	General Emergency
IRIS	Internet Routed Information System
JIC	Joint Information Center
KI	Potassium Iodide

APPENDIX 2

EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the H. B. Robinson Steam Electric Plant exercise on October 7, 2003. The organization which each evaluator represents is indicated by the following abbreviations:

FEMA - - Federal Emergency Management Agency
ICF - - ICF Incorporated
NRC - - Nuclear Regulatory Commission

Lawrence A. Robertson

Chairman, RAC IV

<u>EVALUATION SITE</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
Chief Evaluator	Eddie Hickman	FEMA
STATE OF SOUTH CAROLINA		
State Emergency Operations Center	Joseph Canoles	FEMA
	Stan Copeland	FEMA
Radiological Liaison	James Lightner	ICF
Dose Assessment	Reginald Rogers	ICF
Radiological Laboratory	Dale Petroff	ICF
Radiological FMT #1	Keith Earnshaw	ICF
Radiological FMT #2	Edward Wojnas	ICF
Emergency Operations Facility	Robert Trojanowski	NRC
JIC/EAS Station	David Moffet	ICF
	Rosemary Samsel	ICF
LP-1 Radio Station WJMX	Brenda Pittman	ICF
CHESTERFIELD COUNTY		
Emergency Operations Center	Tom Reynolds	FEMA
Protective Action for Schools	Bill Larrabee	ICF

APPENDIX 3

EXERCISE CRITERIA AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise criteria, which were scheduled for demonstration in the H. B. Robinson Steam Electric Plant exercise on October 7, 2003 and were submitted with the extent-of-play agreement submitted by the State of South Carolina and approved by FEMA Region IV.

A. Exercise Criteria

Attached are the specific radiological emergency preparedness criteria scheduled for demonstration during this exercise.

Extent of Play Agreement
H.R. Robinson Steam Electric Plant REP Exercise
October 7, 2003

1. Emergency Operations Management.

Sub-element 1a, Mobilization

Criterion 1.a.1: OROs use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner. (NUREG-0654, A.4, D.3, 4, E.1, 2, H.4)

With the exception of DHEC field teams and mobile radiological laboratory personnel, all state and local government personnel will be pre-positioned. Alert rosters will be provided to FEMA evaluators and a discussion of call-down procedures will be conducted.

DHEC will activate and mobilize field team and 3 mobile laboratory resources at the Farrow Road Command Center. Field teams and the mobile radiological laboratory will be deployed to the South Carolina Army National Guard Armory-Darlington, SC in response to scenario events (Note: Deployment of field resources would normally occur at the Site Area Emergency ECL. Due to time constraints and safety considerations, DHEC will initiate mobilization procedures at approximately 0500, October 7, 2003 at the Notification of Unusual Event ECL).

Sub-element 1.b, Facilities

Criterion 1.b.1: Facilities are sufficient to support the emergency response. (NUREG -0654, H)

Counties will be evaluated to establish a baseline for exercise evaluation criteria. Some of the areas to be considered are: adequate space, furnishings, lighting, restrooms, ventilation, backup power and/or alternate facility (if required to support operations).

Sub-element 1.c, Direction and Control

Criterion 1.c.1: Key personnel with leadership roles for the ORO provide direction and control to that part of the overall response effort for which they are responsible. (NUREG-0654, A.1.d., 2.a., b.)

Direction and Control will be at the State Emergency Operations Center (SEOC). County Direction and Control will take place at the Chesterfield County, Darlington County, and Lee County Emergency Operations Centers

Change one. 09/09/03

At locations **where** traffic and access control personnel are deployed, the availability of appropriate equipment (e.g., vehicles, barriers, traffic cones and signs, etc.) will be described by law enforcement personnel.

2. Protective Action Decision Making,

Sub-element 2.a., Emergency Worker Exposure Control

Criterion 2.a.1: OROs use a decision-making process, considering relevant factors and appropriate coordination, to insure that an exposure control system, including the use of KI, is in place for emergency workers including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. (NUREG-0654, K.4.)

Dose limits for emergency workers are **pre-determined**. Emergency workers may voluntarily exceed dose limits only after being fully informed by DHEC of the biological effects of radiation and possible consequences of excessive exposure.

Sub-element 2.b. Radiological Assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency

Criterion 2.b.1: Appropriate protective action recommendations are based on available information on plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of on-site and off-site environmental conditions. (NUREG-0654, I.8., 10., 11. and Supplement 3.)

Protective action recommendations by DHEC will be based on an evaluation of information received from the licensee, independent dose assessments and field monitoring team data input.

Criterion 2.b.2: A decision-making process involving consideration of appropriate factors and necessary coordination is used to make protective action decisions (PADs) for the general public (including the recommendation for the use of KI, if ORO policy) (NUREG-0654, J.9., 10.M.)

The Governor or his designee will demonstrate the ability to make appropriate protective action decisions (PADs) based on recommendations from DHEC. PADs that require sheltering or evacuation of **residents** or transients in the 10-mile EPZ will be coordinated with the chief county elected official or designee.

Sub-element 2.c, Protective Action Decisions Consideration for the Protection of Special Populations

Chesterfield, Darlington, and Lee counties will demonstrate the ability and resources to implement appropriate protective actions for special population groups. A list of people with special transportation needs will be provided to evaluators. Evacuation assistance will not take place

Criterion 3.c.2: OROs/School officials decide upon and implement protective actions for schools. (NUREG-0555, J. 10.c., d., g.)

Chesterfield and Darlington counties will simulate school evacuations by out-of-sequence interviews with key school staff members.

Chesterfield County school to be evaluated is McBee Elementary School.

Darlington County schools to be evaluated are North Hartsville Elementary School, Thornwell Elementary School and West Hartsville Elementary School.

Criterion 3.d.1: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel. (NUREG-0654, J.10.g., j., k.)

Traffic and Access Control Points (TACP's) are pre-determined. The South Carolina Highway Patrol will demonstrate Traffic and Access Control on-scene at TAGP #16A, SC-151 and 5-23, #16E, US-52/401 and US-15 and #16F US-52/401 and SC-41. Lake clearing operations will immediately follow TACP demonstration at Johnson Landing, Darlington County.

Chesterfield County TACP to be evaluated at the county EOC is #13A, US-1 and SC-151.

Darlington County TACP to be evaluated at the county EOC is #16G, US-52 BYP and SC34/151.

Lee County TACP to be evaluated at the county EOC is TACP #31A, US 15 and SC 34.

Criterion 3.d.2: Impediments to evacuation are identified and resolved (NUREG-0654, J.10.,k.)

Actions to identify and remove impediments to evacuation will be demonstrated by discussion with the highway patrol supervisor at the Darlington county EOC.

4. Field Measurement and Analysis.

Sub-element 4.a, Plums Phase Field Measurements and Analyses

5. Emergency Notification and Public Information

Sub-element 5.a, Activation of the Prompt Alert and Notification System

Criterion 5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized off-site emergency officials to notify the public of an emergency situation. The initial instructional message to the public must include as a minimum the elements required by current FEMA REP guidance. (10 CFR Part 50, Appendix E & NUREG-0654, E.1., 4., 5., E., 7.)

The State will coordinate Protective Action Decisions (PAD) with the Chief South Carolina county elected officials or designees. At Site Area Emergency, sirens and the Emergency Alert System (EAS) will be activated. A test EAS message will be transmitted to the Local Primary (LP-1) EAS station, (WJMX, Florence, SC). A simulated EAS message and follow-on news release will be prepared but will not be transmitted to the LP-1 station. Copies of the simulated EAS message and news release will be provided to the FEMA evaluator at the SEOC. The LP-1 station will have staff available for interview during the EAS demonstration. At General Emergency, activation of the sirens and EAS broadcast will be simulated.

Criterion 5.a.3: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized off-site emergency officials to notify the public of an emergency situation. Backup alert and notification of the public is completed within 45 minutes following the detection by the ORO of a failure of the primary alert and notification system. (NUREG-0654, E.6., Appendix 3.B.2.c)

If there is a siren failure, affected counties will describe back-up alerting system.

Sub-element 5.b, Emergency Information and Instructions for the Public and the Media

Criterion 5.b.1: OROs provide accurate emergency information and instructions to the public and the news media in a timely manner. (NUREG-0654, E. 5., 7. G.3.a., G.4, a., b., c.)

The State, Chesterfield County, Darlington County, and Lee County will demonstrate the ability to coordinate the formulation and dissemination of accurate information and instructions to the news media at the Joint Information Center (JIC). Rumor control for the State will be demonstrated at the JIC. Rumor control for Chesterfield, Darlington and Lee counties will be demonstrated at the appropriate county EOC. Rumor control personnel will provide a rumor calls log to the FEMA Evaluator.

APPENDIX 4

EXERCISE SCENARIO

This appendix contains a summary of the simulated sequence of events, Exercise Scenario, which was used as the basis for invoking emergency response actions by OROs in the H. B. Robinson exercise on October 7, 2003.

This exercise scenario was submitted by the State of South Carolina and approved by FEMA Region IV.

H.B. Robinson Steam Electric Plant Unit No. 2

NRC Biennial Evaluated Exercise

October 7, 2003

Narrative Summary and Timeline

Note

This exercise is a Biennial Evaluated Exercise with partial participation by the State and County agencies. The exercise will be conducted with the Control Room Simulator in the interactive mode. All times are for planning purposes and may vary (except the start of the release) due to the response of the Operations Crew located in the Simulated Control Room.

At 0630 on October 7, 2003, H. B. Robinson Steam Electric Plant (HBRSEP) Unit No. 2 is at 100 percent power and at the middle of core life and has been in continuous operation for 203 days. The Southeast United States has experienced an increase in seismic activity over the past several months.

A strong area of high pressure is located to the southeast and is maintaining a steady position. Partly cloudy skies with variable winds from 5 to 10 miles per hour (mph) will be the forecast for the area through the next weekend. Day time temperatures will be in the mid-fifties through Friday; night time temperatures are expected to be in the low thirties. Winds will be from the North/North West with a heading of about 315 degrees.

0700 The Operations Crew assumes the watch taking control of the plant

0715 A seismic alarm will occur in the Control Room. The crew is expected to respond to the alarm in accordance with APP-036 and AOP-021, Seismic Event. The Control Room will receive confirmation of seismic activity in the region.

0730 Conditions are met for the declaration of an **UNUSUAL EVENT**. An **UNUSUAL EVENT** should be declared at this time.

0750 A steam leak will occur outside of containment on 'B' main steam line. The crew will commence a plant shutdown in accordance with GP-006.

0810 RCS leakage will occur in 'A' Steam Generator at ~50 gpm. An unmonitored release will occur via the steam driven AFW warm-up line and will cause secondary side contamination until the release path is isolated. The release will not impact any offsite locations.

0825 Conditions are met for the declaration of an **ALERT** due to RCS leakage greater than 50 gpm. An **ALERT** should be declared by this time.

0850 As the crew is responding to RCS leakage into A Steam Generator, Component Cooling Water Pump 'A' trips offline.

