FEMA Region IV

Atlanta, Georgia

Final Exercise Report

H. B. Robinson Nuclear Station

Licensee:	**Carolina Power and Light Company**
Exercise Date:	**October 9, 2001**
Report Date:	**November 20, 2001**

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION IV
3003 Chamblee-Tucker Road
Atlanta, Georgia 30341

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Atlanta, Georgia 30341

November 20, 2001

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

Dear Mr. Reyes:

Enclosed is the final report for the H.B. Robinson Exercise that was conducted on October 9, 2001. This was a full participation, plume exposure pathway exercise designed to evaluate the offsite radiological emergency response plans site-specific to the H. B. Robinson Nuclear Station. The report addresses the evaluation of the plans and preparedness for the State of South Carolina and the counties within the 10-mile Emergency Planning Zone. The State of South Carolina, the Risk Counties of Chesterfield, Darlington, and Lee, and the Host County of Florence participated in the exercise. The final exercise report was prepared by the Federal Emergency Management Agency Region IV staff. Copies of this report will be forwarded to the State of South Carolina, FEMA Headquarters, and NRC Headquarters by my staff.

In addition to state and county personnel, many volunteers, numerous elected officials, and the LP-1 radio station, WJMX, also participated in this exercise. Noteworthy was the intensity of all of the players during this exercise. It was especially noticeable in the State and county emergency operation centers. Since the events of September 11th, everyone seemed to have a renewed interest in their duties and responsibilities, and all of the participants took their roles very seriously during the exercise.

All agreed upon objectives for the exercise were demonstrated. No Deficiencies and no Areas Requiring Corrective Action (ARCA) were identified during this full participation exercise. Two ARCAs from the December 7, 1999 exercise were corrected during subsequent REP exercises: one during the March 29, 2000 Vogtle Electric Generating Plant exercise and the other during the June 13, 2000 Oconee Nuclear Station exercise. In addition, two ARCAs from the July 18, 2001 V. C. Summer Nuclear Station exercise were corrected. One dealt with the State Emergency Operation Centers EAS messages, and one dealt with Dose Assessment's failure to notify their field teams to ingest KI.

Based on the results of the October 9, 2001, exercise and FEMA's review of the State's Annual Letters of Certification for 2000 and 2001, the offsite radiological emergency response plans for the State of South Carolina and the affected local jurisdictions, site-specific to the H. B. Robinson Nuclear Station, 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 State of South Carolina's offsite radiological emergency response plans and preparedness site-specific to the H. B. Robinson Nuclear Station, granted on December 29, 1981, will remain in effect.

Should you have any questions, please contact Joseph Canoles at 770/220-5453.

Sincerely,

For: Mary Lynne Miller
Acting Regional Director

Enclosure

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I. EXECUTIVE SUMMARY

On October 9, 2001, a full participation exercise was conducted in the plume exposure emergency planning zone (EPZ) around the H. B. Robinson Nuclear Station. 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 December 7, 1999. 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 10th.

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. An ARCA (ARCA) concerning the notification of the radiological field monitoring teams to ingest potassium iodide, identified during the 2001 V. C. Summer exercise was corrected during this exercise. Especially noteworthy was the intensity of all of the participants during this exercise. The events of September 11, 2001 have caused State and local officials to view these exercises from a much different perception.

II. INTRODUCTION

On December 7, 1979, the President directed FEMA to assume the lead responsibility for all 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.

FEMA 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 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 H. B. Robinson Nuclear Station 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 9, 2001, 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 Nuclear Station. 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;

- 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 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 9, 2001, exercise to test the offsite emergency response capabilities in the area surrounding the H. B. Robinson Nuclear Station.

A. Emergency Planning Zone Description

The H. B. Robinson Nuclear Station is located west of the Lake Robinson Dam in western Darlington County. The facility is owned and operated by the Carolina Power and Light Company.

In operation since March 1971, the H. B. Robinson Nuclear Station 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 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.

A 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 Nuclear Station exercise on October 9, 2001.

STATE OF SOUTH CAROLINA

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

South Carolina Highway Patrol
Department of Natural Resources

RISK JURISDICTIONS

Chesterfield County
Darlington County
Lee County

HOST JURISDICTION

Florence County

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross
Radio Amateur Civil Emergency Service (RACES)

C. Exercise Timeline

Table 1, on the following page, presents the time at which key events and activities occurred during the H. B. Robinson Nuclear Station exercise on October 9, 2001.

Table 1. Exercise Timeline

DATE AND SITE: October 9, 2001 – H. B. Robinson Nuclear Station

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received or Action Was Taken					
		SEOC	DOSE	JIC	CHESTERFIELD COUNTY	DARLINGTON COUNTY	LEE COUNTY
Unusual Event	0746	0756			0756	0805	0758
Alert	0827	0836	0855		0836	0836	0836
Site Area Emergency	0932	0945	0935	0946	0945	0946	0946
General Emergency	1038	1051	1050	1053	1051	1051	1053
Simulated Rad. Release Started	1038	1051	1050	1053	1051	1051	1053
Simulated Rad. Release Terminated	End Ex						
Facility Declared Operational		0850	0845	0942	0843	0845	1000
Declaration of State of Emergency		0850		0930	0905	0845	0906
Exercise Terminated		1220	1225	1231	1155	1215	1210
Early Precautionary Actions: Relocated schools Stay tuned message Place animals on stored feed and water		1005			0850 0900	0850 0900	N/A 0900
1st Protective Action Decision Activate sirens – Stay tuned for further info		1007			1007	1007	1007
1st Siren Activation		1015			1015	1015	1015
1st EAS Message		1018			1018	1018	1018
2nd Protective Action Decision **Evacuate:** A0,A1,A2,B1,B2,E1 and E2 **Shelter:** C1, C2, D1 and D2		1113			1113	1113	1113
2nd Siren Activation		1118			1118	1118	1118
2nd EAS Message		1122			1122	1122	1122
KI Administration Decision: Distribute Ingest		1007 1157			0937 Play terminated prior to Ingestion decision	1015 1157	1023 1157

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 9, 2001 exercise to test the offsite emergency response capabilities of state and local governments in the 10-mile EPZ, surrounding the H. B. Robinson Nuclear Station.

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, presents the status of all exercise objectives from FEMA-REP-14, which were scheduled for demonstration during this exercise by participating jurisdictions and functional entities. 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 of Exercise Evaluation

DATE AND SITE: October 9, 2001 - H. B. Robinson Nuclear Station

JURISDICTION/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
State of South Carolina																																	
State Emergency Operations Center	M	M	M	M					M	M	M			M																			
Radiological Liaison				M			M		M					M																			
Dose Assessment			M	M			M		M					M																			
Radiological Field Monitoring Teams				M	M	M		M																									
Emergency Operations Facility				M	M																												
Joint Information Center												M	M																				
LP-1 Radio Station WJMX										M																							
State Traffic Control Points					M												M																
RISK JURISDICTIONS																																	
Chesterfield County																																	
Emergency Operations Center	M	M	M	M					M	M	M		M	M	M																		
Protective Actions for Schools																M																	
Traffic Control Points				M	M												M																
Emergency Worker Decontamination					M																	M											
Reception and Congregate Care					M													M	M														
Darlington County																																	
Emergency Operations Center	M	M	M	M					M	M	M		M	M	M																		
Protective Actions for Schools																M																	
Traffic Control Points				M	M												M																
Emergency Worker Decontamination					M																	M											
Lake Warning					M					M																							
Medical Service Drill (MS-1)					M															M	M												
Lee County																																	
Emergency Operations Center	M	M	M	M					M	M	M		M	M	M																		
Traffic Control Points				M	M												M																
Emergency Worker Decontamination					M																	M											
Reception and Congregate Care					M													M	M														
HOST JURISDICTION																																	
Florence County																																	
Reception and Congregate Care					M													M	M														

LEGEND: M = Met A = ARCA(s) assessed and/or unresolved prior ARCAs D = Deficiency

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 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.

- **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.

1. STATE OF SOUTH CAROLINA

1.1 State Emergency Operations Center

The State Emergency Operations Center (SEOC) is a modern facility that is equipped with state of the art technology providing a professional work environment for the staff. Effective use was made of the Internet Routed Information System (IRIS). Alert and notification, protective action recommendations, and other decisions were coordinated with the affected counties and other response organizations. The chief of operations demonstrated the ability to direct and control SEOC operations. A professional staff exhibited a high level of concern and motivation.

a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11 and 14

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:**

Issue No.: 61-01-11-A-01

Description: At 1028 and 1123, EAS messages were broadcast by the LP-1 radio station. The EAS messages had follow-on news releases that were also faxed to the radio station to be read upon conclusion of the EAS message. These follow-on messages included additional information concerning the evacuation and shelter-in-place decisions. Part of the information included a statement that told citizens needing assistance to contact the county EOCs for help. However, the EOC names and phone numbers were not added to the messages as indicated.

Corrective Action Demonstrated: EAS messages and pre-scripted follow-on news releases had been revised and no longer reference County EOC telephone numbers.

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

1.2 Radiological Liaison

The Nuclear Emergency Response Coordinator (NERC) at the SEOC was responsible for the overall activities of the Department of Health and Environmental Control (DHEC) response. The Nuclear Response and Environmental Surveillance Section (NRES) staff was pre-positioned at the SEOC in accordance with the extent-of-play agreement. As information became available from the plant, the NRES staff verified the information and

analyzed the consequences of potential protective actions. The NERC provided recommendations to the Emergency Preparedness Division (EPD). The NRES staff anticipated additional actions and was prepared to act rapidly in response to them. The NRES staff coordinated information from the State dose assessment personnel, field monitoring teams (FMT) and the plant in developing the protective action recommendations (PAR).

a. **MET:** Objectives 4, 7, 9 and 14

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **NOT DEMONSTRATED:** NONE

1.3 Dose Assessment

DHEC's dose assessment group was located at the Forward Emergency Operations Center in the National Guard Armory in Darlington. The dose assessment group successfully demonstrated the ability to provide PARs to the DHEC liaison at the SEOC using computer generated dose projections, based upon data provided by the utility's Emergency Operation Facility (EOF). Comparisons between the utility's dose projections and the dose assessment group were within a factor of two. DHEC field teams were also directed from this location and the results of their measurements were considered in the protective action recommendations. Communication between the dose assessment group and the DHEC liaison at the SEOC was excellent. The DHEC decision regarding the ingestion of KI was promptly communicated to the emergency workers.

a. **MET:** Objectives 3, 4, 7, 9 and 14

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs - RESOLVED:**

Issue No.: 61-01-03-A-02 (V. C. Summer Exercise)

Description: The field monitoring team (FMT) personnel were not informed of the recommendation to ingest KI.

The NERC determined that KI should be administered to emergency workers in the evacuation zones at 1220. This message (ID #24627) was released on the IRIS computer system to all EOCs, all ESFs and operations. This message was received at the command center; however, the message was not noticed until just prior to the termination of the exercise. The IRIS system was not regularly monitored by the staff and information was not relayed to the FMT Director so that the FMT personnel could be informed of the need to ingest KI.

SCDHEC Plan, Appendix I – Protective Action Guides, Section II. SCDHEC Plan for the Distribution of Potassium Iodide (KI) if a Nuclear Accident Creates a Possible Public Hazard from Radioactive Iodine Gases, Paragraph C – KI Administration (pages I – 10 and I – 11, January 2000) SCDHEC Standard Operating Procedure 5.3 (November 1999). (NUREG-0654 A.1.d., 2.a., b., J.10.e., f.)

Corrective Action Demonstrated: At 1205 the DHEC liaison at the SEOC notified the FEOC Coordinator to advise the field teams to ingest their KI. The FEOC Coordinator briefed the FMT Director and the field teams were instructed, at 1206, to ingest KI.

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.4 Radiological Field Monitoring Teams

DHEC deployed two FMTs from the Armory. Before being deployed the field teams were given a short briefing that included the Emergency Classification Level, general initial assignments, and the wind direction. The personnel making up the FMTs used for this exercise routinely monitor and sample for non-radioactive hazardous materials. As a result, they were very conscious of good sample handling and cross contamination practices. They were familiar with the sample collection procedures and demonstrated the ability to take radiation survey measurements and collect and analyze air samples. Cross training of personnel is being done to increase the number of teams available to respond to emergencies.

a. **MET:** Objectives 4, 5, 6 and 8

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 EOF, located on-site in the facility training complex, is an excellent facility from which all participating organizations can effectively manage ongoing emergency operations. Communications, coordination, and the flow of technical information between the utility operator and State officials were exemplary. All of the State officials deployed to the EOF were well trained, knowledgeable, followed applicable procedures; and overall, performed their respective responsibilities in an efficient and professional manner.

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

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

1.6 Joint Information Center

The capability to coordinate the development and dissemination of clear, accurate, and timely information to the news media was demonstrated. The very knowledgeable and professional public information team coordinated 14 news releases for dissemination to the media and public. The two news conferences were very well organized and timely. The rumor control and public inquiry team were proactive and effective in coordinating with the Joint Information Center (JIC) coordinator to identify and resolve potentially critical trends and issues that arose in 79 calls.

a. **MET:** Objectives 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

1.7 LP-1 Radio Station WJMX

WJMX, the LP-1 Radio Station, demonstrated the capability to promptly broadcast Emergency Alert System (EAS) messages issued by the State of South Carolina. The SEOC authorized activating of the EAS. The SEOC and WJMX communicated by telephone to confirm authentication codes, verify receipt of faxed copies of the test message, content of the message, and time the message was to be broadcast. WJMX personnel discussed alternate systems they would use if something happened to the primary system. The station also has the capability to broadcast the message if the station is unmanned. Personnel interviewed included the Chief Engineer/Operator for Root Communications, WJMX Morning Show Producer, and the FM Music Director/Program Director. All personnel were knowledgeable of the EAS broadcast procedures. The radio station staff was very enthusiastic about providing this service to the community.

a. **MET:** Objective 10

1.8 State Traffic Control Point

Two South Carolina Highway Patrol (SCHP) troopers were assigned to each of the two traffic control points (TCP) (16-A and 16-B). The troopers understood radiological exposure control and had appropriate dosimetry and exposure record sheets. A TCP specific handbook with guidelines was available and used by the troopers. The troopers successfully demonstrated that they know their mission, understand how to establish TCPs, and are capable of supporting all requirements associated with TCP activities.

a. **MET:** Objectives 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

2. RISK JURISDICTIONS

2.1 CHESTERFIELD COUNTY

2.1.1 Emergency Operations Center

The Emergency Operation Center (EOC) staff was pre-positioned in accordance with the extent-of-play agreement, but the EOC was not declared operational until shortly after the utility had declared an Alert. The County Emergency Services Director provided an initial situational briefing and established an immediate "in-charge" demeanor. He frequently conducted informative briefings and involved the staff in critical decisions. Staff members were particularly motivated for this exercise resulting in an outstanding coordinated effort. Members of the EOC staff were professional and knowledgeable of their duties.

a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 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 Protective Actions for Schools

The Chesterfield County School District's Assistant Superintendent of Operations, and an intern, participated in an interview regarding protective actions for schools. They stressed that the implementation of protective actions taken to safeguard and account for students was a joint decision between the School District and the Emergency Management Agency. The interview indicated that administrative staff and faculty have received training on actions to take during emergencies.

A District Crisis Management Plan and school specific plans have been developed. The interviewees provided the school plans for Plainview Elementary School, McBee Elementary School and McBee High School. These plans address procedures, responsibilities and actions to take in the event that sheltering or evacuation would be directed.

a. **MET:** Objective 16

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

2.1.3 Traffic Control Points

Two SCHP troopers and one Chesterfield Police Department (CPD) officer successfully demonstrated knowledge of radiological exposure control and TCP procedures during interviews. The County Radiological Officer issued the officers packets, which contained simulated potassium iodide (KI), a permanent record dosimeter (PRD) and a direct-reading dosimeter (DRD). When directed, SCHP and CPD personnel report to the EOC en-route to their assigned TCP. The officers are briefed and the Radiological Officer provides a radiological information packet. The officers were confident of their ability to take necessary actions to overcome traffic impediments.

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

2.1.4 Emergency Worker Decontamination

Emergency Medical Services (EMS) personnel, from First Health of the Carolinas, successfully demonstrated their ability to establish and conduct emergency worker decontamination operations. The participants' actions reflected an exceptional level of training and competence in performing both the personnel and vehicle monitoring and decontamination. The County Radiological Officer supervised the entire operation.

a. **MET:** Objectives 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

2.1.5 Reception and Congregate Care

Members of First Health of the Carolinas and American Red Cross (ARC) volunteers successfully demonstrated reception and congregate care. Monitoring and decontamination of evacuees was demonstrated by EMS personnel under the supervision of the County Radiological Officer. Personnel were well trained, competent in executing their responsibilities, and knowledgeable of personal radiological protective measures.

Registration and sheltering operations conducted by the local ARC was in accordance with the plan. All participants were very conscientious in the performance of their duties and demonstrated a compassionate feeling toward evacuees.

a. **MET:** Objectives 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

2.2 DARLINGTON COUNTY

2.2.1 Emergency Operations Center

The EOC operation continues to provide exceptional support to the residents of Darlington County. The presence of the County Administrator, and a visit by the Chairperson of the County Council was reflective of the County's commitment to public safety. CP&L, DHEC and EPD representatives assisted in the Darlington County EOC during the exercise. The EOC staff was well trained and highly motivated, each played an active role throughout the exercise.

The EOC Director effectively managed emergency operations. He provided frequent briefings and requested agency activity updates during the briefings. He had the utility representative explain plant conditions and encouraged questions from the staff. Each briefing included a reference to the plan and a request for the staff to plan ahead in case plant conditions degraded. The EOC staff appropriately coordinated with other agencies and locations. The Civil Air Patrol (CAP) and the Humane Society continue to provide excellent support to the county.

a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 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

2.2.2 Protective Actions for Schools

The Darlington County School Transportation Coordinator, principals from Washington Street Elementary, Southside Elementary and Sonovista Schools, and an intern participated in a series of interviews addressing protective actions to be taken in the event of an accident at the H.B. Robinson Nuclear Station. The principals were all very knowledgeable of protective actions that would be implemented. All have developed plans for evacuation and sheltering of students to include detailed guidelines for accountability of all students. Staff members receive periodic training and student evacuation drills are conducted monthly. The Transportation Coordinator addressed transportation requirements and indicated that there are sufficient bus resources to simultaneously evacuate all schools within the 10-mile EPZ. Personnel demonstrated that they are prepared to safeguard their students in the event of an accident.

a. **MET:** Objective 16

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

2.2.3 Traffic Control Points

Four deputies from the Darlington County Sheriff's Office were interviewed. The Deputies were knowledgeable of the plan for TCPs, had a handbook for TCP-16, understood their mission, and the establishment of TCP-16. The deputies also discussed their communications capabilities and reporting requirements. The Deputies had appropriate dosimetry and individual record sheets. They had an in-depth knowledge of procedures for dosimetry and reporting/recording requirements. Two police officers from the Hartsville Police Department were there as observers.

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

2.2.4 Emergency Worker Decontamination

Personnel from Darlington County EMS and the Darlington County Fire Department successfully demonstrated radiological monitoring and decontamination of emergency workers. Personnel demonstrated the ability to control radiation exposure while monitoring and decontaminating emergency workers and their vehicles. Appropriate dosimetry was issued in accordance with plans. The demonstration showed personnel had a thorough understanding of decontamination procedures and equipment, as well as the importance of personal dosimetry.

a. **MET:** Objectives 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

2.2.5 Lake Warning

Two Department of Natural Resources officers interviewed were enthusiastic and knowledgeable of the procedures for lake warning. They had appropriate dosimetry and were knowledgeable of radiological exposure control procedures. Posted signs were obvious and in good repair.

a. **MET:** Objectives 5 and 10

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

2.2.6 Medical Service Drill (MS-1)

See full report at Appendix 5

a. **MET:** Objectives 5, 20 and 21

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 LEE COUNTY

2.3.1 Emergency Operations Center

The facility is equipped to support 24-hour operations during an emergency situation. The staff is comprised of full-time employees and volunteers. Personnel understood their responsibilities and successfully demonstrated their ability to implement the county plan.

The EOC has the capability to link to the SEOC by IRIS. The Disaster Preparedness Agency Coordinator managed EOC operations, provided updates and guidance on the incident status and response activities and included the staff in the decision-making process. The EOC staff was professional and displayed a positive attitude.

a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 11, 13, 14 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

2.3.2 Traffic Control Points

A Captain from the Lee County Sheriff's Department successfully demonstrated TCP procedures through an interview. The officer had appropriate dosimetry and record forms and was knowledgeable of radiological exposure control procedures. A briefing included detailed instructions regarding responsibilities, general information to assist the public and supplemental information pertaining to emergency worker protection specifically for the TCP prior to its establishment. The Captain displayed a high degree of professionalism and knowledge. He discussed the actions he would take to physically establish a TCP and how he would obtain backup logistical support (e.g., cones, barriers) if required.

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

2.3.3 Emergency Worker Decontamination

Members of the Bishopville Fire Department successfully demonstrated their capability for establishing and operating an emergency worker decontamination facility. The demonstration area was set up for the efficient receipt, monitoring, and decontamination of emergency vehicles and personnel. Individual DRDs and exposure records were issued and readings recorded in accordance with plans. The monitoring and decontamination of one vehicle and driver reflected their understanding of monitoring and decontamination. The teams utilized appropriate personal protective equipment, and they enthusiastically and professionally performed their duties.

a. **MET:** Objectives 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

2.3.4 Reception and Congregate Care Center

The reception center was established at the Bishopville City Warehouse. The Bishopville Fire Department and Lee County EMS demonstrated monitoring and decontamination procedures for vehicles and the public. This location was effectively organized for the effective management of contaminated and non-contaminated evacuees. Vehicle monitoring, decontamination and storage were accomplished in a large parking lot adjacent to the warehouse. After processing through the reception center, evacuees were directed to the congregate care facility. Transportation was provided for those who needed it.

The congregate care facility was located at Bishopville High School. Personnel from the Central South Carolina ARC Chapter and DSS organized and staffed the facility. Sufficient space and ancillary functions, such as the kitchen area, are available to support the expected number of evacuees. Personnel demonstrated an excellent knowledge of their requirements and duties.

a. **MET:** Objectives 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

3. HOST JURISDICTION

3.1 FLORENCE COUNTY

3.1.1 Reception and Congregate Care

County Emergency Management and Florence Fire Department personnel successfully demonstrated reception center activities at Wilson High School. They displayed an understanding of radiological exposure control and procedures for monitoring and decontamination of evacuees. Members of the Pee Dee Chapter, ARC successfully demonstrated congregate care activities at Wilson High School. ARC volunteers, with assistance from the DSS and EMA, established and operated the congregate care facility. Employees and volunteers were professional and well versed in their responsibilities.

a. **MET:** Objectives 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. SUMMARY OF AREAS REQUIRING CORRECTIVE ACTION (ARCA)

4.1 ARCAs RESOLVED

4.1.1 61-01-11-A-01 SEOC

Description: At 1028 and 1123, EAS messages were broadcast by the LP-1 radio station. The EAS messages had follow-on news releases that were also faxed to the radio station to be read upon conclusion of the EAS message. These follow-on messages included additional information concerning the evacuation and shelter-in-place decisions. Part of the information included a statement that told citizens needing assistance to contact the county EOCs for help. However, the EOC names and phone numbers were not added to the messages as indicated.

Corrective Action Demonstrated: EAS messages and pre-scripted follow-on news releases had been revised and no longer reference County EOC telephone numbers.

4.1.2 61-01-03-A-02 Dose Assessment (V.C. Summer)

Description: The field monitoring team (FMT) personnel were not informed of the recommendation to ingest KI.

The NERC determined that KI should be administered to emergency workers in the evacuation zones at 1220. This message (ID #24627) was released on the IRIS computer system to all EOCs, all ESFs and operations. This message was received at the command center; however, the message was not noticed until just prior to the termination of the exercise. The IRIS system was not regularly monitored by the staff and information was not relayed to the FMT Director so that the FMT personnel could be informed of the need to ingest KI.

SCDHEC Plan, Appendix I – Protective Action Guides, Section II. SCDHEC Plan for

the Distribution of Potassium Iodide (KI) if a Nuclear Accident Creates a Possible Public Hazard from Radioactive Iodine Gases, Paragraph C – KI Administration (pages I – 10 and I – 11, January 2000) SCDHEC Standard Operating Procedure 5.3 (November 1999). (NUREG-0654 A.1.d., 2.a., b., J.10.e., f.)

Corrective Action Demonstrated: At 1205 the DHEC liaison at the SEOC notified the FEOC Coordinator to advise the field teams to ingest their KI. The FEOC Coordinator briefed the FMT Director and the field teams were instructed, at 1206, to ingest KI.

APPENDIX 1

ACRONYMS AND ABBREVIATIONS

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

ANI	American Nuclear Insurers
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ALARA	As Low As Reasonably Achievable
CAP	Civil Air Patrol
CFR	Code of Federal Regulations
CPD	Chesterfield Police Department
CP&L	Carolina Power and Light Company
CPM	Counts Per Minute
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
EW	Emergency Worker
FAA	Federal Aviation Agency
FEMA	Federal Emergency Management Agency
FR	Federal Register
FMT	Field Monitoring Teams

ft/min	feet per minute
ft^3/min	cubic feet per minute
GE	General Emergency
GM	Guidance Memorandum
IP	Implementing Procedure
IRIS	Internet Routed Information System
JIC	Joint Information Center
KI	Potassium Iodide
mR	milliroentgen
mR/h	milliroentgen per hour
NERC	Nuclear Emergency Response Coordinator
NRES	Nuclear Response Environmental Surveillance Section
NRC	U.S. Nuclear Regulatory Commission
NUREG-0654	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*
ORO	Offsite response organizations
PAD	Protective Action Decision
PAR	Protective Action Recommendation
PIO	Public Information Officer
R	Roentgen
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RDO	Radiological Defense Officer
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
R/h	Roentgen(s) per hour
SAE	Site Area Emergency
SCHP	South Carolina Highway Patrol
SEOC	State Emergency Operations Center
TCP	Traffic Control Point
TLD	Thermoluminescent Dosimeter
USDA	U.S. Department of Agriculture

APPENDIX 2

EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the H. B. Robinson Nuclear Station exercise on October 9, 2001. 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**

EVALUATION SITE	EVALUATOR	ORGANIZATION
Joseph E. Canoles	Chief Evaluator	FEMA
STATE OF SOUTH CAROLINA		
State Emergency Operations Center	Al Hall Brenda Pittman	ICF ICF
Radiological Liaison	Melody Geer	ICF
Dose Assessment	Bernie Hannah	ICF
Radiological Field Monitoring Team #1	James Willison	ICF
Radiological Field Monitoring Team #2	Elizabeth Thompson	ICF
Emergency Operations Facility	Bob Trojanowski	NRC
Joint Information Center	Brett Kriger	ICF
LP-1 Radio Station WJMX	Jesse Johnson	ICF
CHESTERFIELD COUNTY		
Emergency Operations Center	Dave Moffett	ICF
Protective Actions for Schools	Paul Ringheiser	ICF
Traffic Control Points	Paul Ringheiser	ICF

EVALUATION SITE	EVALUATOR	ORGANIZATION
Emergency Worker Decontamination	Warren Parks	ICF
Reception and Congregate Care	Warren Parks	ICF
DARLINGTON COUNTY		
Emergency Operations Center	Joseph Canoles	FEMA
Protective Actions for Schools	Paul Carlson	ICF
County Traffic Control Point	Paul Carlson	ICF
State Traffic Control Point	Paul Carlson	ICF
Emergency Worker Decontamination	Wayne Davis	ICF
Lake Warning	Helen Wilgus	FEMA
Medical Service Drill	Joseph Canoles Bernie Hannah	FEMA ICF
LEE COUNTY		
Emergency Operations Center	Bill Larrabee	ICF
Traffic Control Points	Doug Stutz	ICF
Emergency Worker Decontamination	Doug Stutz	ICF
Reception and Congregate Care	Doug Stutz	ICF
FLORENCE COUNTY		
Reception and Congregate Care	Wayne Davis	ICF

APPENDIX 3

EXERCISE OBJECTIVES AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise objectives, which were scheduled for demonstration in the H. B. Robinson Nuclear Station exercise on October 9, 2001 and were submitted with the extent-of-play agreement submitted by the State of South Carolina and approved by FEMA Region IV.

A. Exercise Objectives

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

H.B. Robinson Steam Generating Plant, Unit 2 REP Exercise Objectives, October 9, 2001

SITE: H.B. Robinson
STATE: SOUTH CAROLINA
EX DATE: 10/09/01
TYPE: Full Participation

	STATE	Chesterfield	Darlington	Florence	Lee		
1 Mob Emerg Personnel	✓	✓	✓		✓		A
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	✓	✓		✓			BIENNIALLY
14 KI-Emer Wkr/Gen Population	✓	✓	✓		✓		B
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		✓	✓		✓		SCENARIO DEPENDANT
23 Supplementary Assistance							C
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							ONCE EVERY 6 YEARS

EXTENT OF PLAY AGREEMENT
H. B. Robinson Steam Generating Plant, Unit 2
Radiological Emergency Preparedness Exercise
October 9, 2001

All selected objectives will be demonstrated fully in accordance with respective plans. Exceptions are noted below.

OBJECTIVES	DEMONSTRATION
1	All State and local government personnel will be prepositioned. State participants include the Emergency Preparedness Division (EPD); Department of Health and Environmental Control, Bureau of Land Waste Management, and the Department of Social Services. A simulation cell will represent the Office of the Adjutant General; Department of Health and Environmental Control, Emergency Medical Services; Department of Mental Health; Department of Public Safety, Highway Patrol; Department of Natural Resources, Law Enforcement; and the South Carolina Army National Guard located at the SEOC. Procedures to mobilize personnel will be demonstrated. Alert rosters will be provided to FEMA evaluators and a discussion of call-down procedures will be conducted.
3	Direction and Control will take place at the State Emergency Operations Center (SEOC), Columbia, SC; Chesterfield County EOC; Darlington County EOC and Lee County EOC.
5	Emergency worker exposure rates will be provided by exercise controller staff. Rates will not be scenario dependent. PRDs will be simulated by empty PRD holders.
6	Field team readings will be provided by exercise controller staff and will be scenario dependent.
7	The scenario will contain a simulated release. Dose assessment will be evaluated at the DHEC Command Center in Columbia.
8	Two field-monitoring teams and the mobile lab will be pre-posititoned at the Darlington SCARNG Armory. Charcoal absorbers will be substituted for silver zeolite cartridges. Cartridges will be reused during the exercise.

10 **Sirens will be simulated in a silent test mode and EAS activated at SAE and both simulated at GE. The initial EAS message will comply with the February 2, 1999 memorandum from Kay Goss on *Guidance for Providing Emergency Information and Instructions to the Public for Radiological Emergencies Using the New Emergency Alert System.* Copies of EAS messages that would be aired in an actual emergency will be provided to FEMA evaluators. A FEMA evaluator will be present at the LP-1 Radio Station, WJMX. Department of Natural Resources, Law Enforcement will demonstrate Lake Clearing Operations via discussion at the Prestwood Lake public Boat Ramp in Darlington County, at 9:00 a.m. (Boat ride optional).**

12 **Mock media will be used at the JIC. Copies of EAS messages and emergency public information news releases that would be aired in an actual emergency will be provided to FEMA evaluators.**

13 **Calls to rumor control personnel will be made by controller personnel. At least six calls each hour will be made to each rumor control person. Calls will commence after public notification of SAE. JIC and county rumor control personnel will provide a log of rumor calls to the FEMA evaluator. Florence county will not be evaluated for rumor control or PIO activities. Request informal evaluation of Florence County PIO.**

14 **KI will be simulated by candy or other means (empty envelope marked "KI").**

15 **Demonstration through discussion of procedures and provision of special population list. A list of available vehicles will be provided to the FEMA evaluator. If non-government assets are used, letters of agreement will be provided to the FEMA evaluator.**

16 **School evacuations will be simulated.**

School notification will take place.

Discussion (interviews) with county principals, transportation coordinators and law enforcement personnel will take place at:

County	School	Location	Time
Chesterfield County:	McBee HS	County EOC	10:00
Darlington County:	Southside Elem	County EOC	11:00
	Washington St. Elem		
	Sonovista Elem		

17 **Calls to control access to rail and air will be simulated. Traffic will not be impeded. Traffic cones and barricades will not be used. State Traffic Control Point 16-B will be evaluated on-scene. A member from the SC Department of Public Safety, Highway Patrol and the SC Department of Transportation will be present.**

State TCP to be evaluated on location is:

16-B, Hwy 23 and Hwy 39

Chesterfield, Darlington and Lee County Traffic Control Points will be evaluated at the respective County EOCs. If detour signs or other blockade materials are used, a member from the affected Department of Transportation will be present to describe how the materials will be transported and emplaced.

County Traffic Control Points to be evaluated are:

Chesterfield: # 1-US 1 & SC 151 # 3-SC 145 & SR 26 # 4-SC 102 & US 1
Darlington: 16-C, SC 151 & SR 200 – 16-D SR 53 & SR 200
Lee: US 15 & SR 341

18/19 **Chesterfield, Florence and Lee County reception centers and shelters will be opened out of sequence. Monitoring, decontamination and registration will be performed. Procedures that assure that only non-contaminated persons enter the shelter will be demonstrated.**

At least six people will be monitored and registered. Personnel decontamination will be via walk-through and discussion (no water will be used). At least two vehicles will be monitored and one vehicle decontaminated in accordance with local SOP (water will be used).

County Reception Centers/Shelters to be evaluated are:

Chesterfield: Chesterfield High School
Florence: Wilson High School
Lee: Bishopville High School

20 **A radiologically contaminated injured person will be transported from within the 10-mile EPZ by Darlington County EMS, at 9:00 A.M., October 10, 2001, at Fire Station #12, Byrdtown Road.**

21 **Medical treatment facility is Carolina Pines Regional Medical Center.**

22 **County Emergency Worker Decontamination will be demonstrated in accordance with local SOPs. Personnel decontamination will be via walk-through and discussion (no water will be used). At least two vehicles will be monitored and one vehicle decontaminated in accordance with local SOP (water will be used).**

County Emergency Worker Decontamination Points to be evaluated are:

Chesterfield: Chesterfield High School
Darlington: County Maintenance Shop
Lee: Bishopville City Fire Department

VI. OTHER EXTENT OF PLAY CONSIDERATIONS:

A. **RAC Briefing: 1300 hours, October 8, 2001at the Darlington County EOC, SC-151 and Rogers Road, Darlington, S.C.**

B. **Participants Critique: 1100 hours, October 11, 2001 at the Darlington County EOC, SC-151 and Rogers Road, Darlington, S.C.**

C. **Public Critique: 1200 hours, October 11, 2001 at the Darlington County EOC, SC-151 and Rogers Road, Darlington, S.C.**

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 9, 2001.

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

CP&L
A Progress Energy Company

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

Emergency Preparedness
Biennial NRC Evaluated Exercise

3.0 Scenario and Timeline

H.B. Robinson Steam Electric Plant Unit No. 2
Biennial NRC Evaluated Exercise
October 09, 2001
Narrative Summary and Timeline

Note:
This exercise is a Biennial NRC Evaluated Exercise, with full 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) based on the response of the Operations Crew located in the Simulated Control Room.

Initial Conditions
H. B. Robinson Steam Electric Plant (HBRSEP) Unit No. 2 is operating at 100 percent power and has been in continuous operation for 150 days. Intermittent alarms have occurred on the Loose Parts Monitoring System. The data has been sent to Westinghouse for analysis.

Weather Conditions
The wind direction is from the southwest at 205 degrees with variable winds from two to six miles per hour.

0700	Crew Briefing and Turnover
0720	Crew assumes the watch.
0725	A Loose Parts Monitoring System Alarm will be received and the crew will be expected to respond IAW APP-036.
	An AO or STA mission should be dispatched to check the monitor.
0740	Radiation Monitor R-9 will increase to greater than 500mR/Hr in last 30 minutes. Conditions will exist for an **UNUSUAL EVENT.**
	Crew may elect to dispatch an HP to perform surveys.
0755	An **UNUSUAL EVENT** should be declared due to R-9 indication.
0815	A rapid reduction in system frequency will occur. A loss of offsite power will occur due to grid disturbances. Emergency Diesel Generators 'A' and 'B' will be energized and provide power to safety related equipment. (No change in EAL status) A reactor trip will occur as a result of the low frequency. The steam driven AFW pump will trip on overspeed.

A high priority (2) mission should be requested for restoration of the SDAFW Pump.

0825 Radiation Monitor R-9 will increase to greater than 5,000 mR in thirty minutes. Conditions will exist for the declaration of an **ALERT** due to the fuel fission product barrier being breached/jeopardized based on R-9 readings. (Crew may elect to isolate letdown at this time)

0840 An **ALERT** should be declared due to the fuel fission product barrier being breached/jeopardized.

0850 A steam line break will occur inside containment on 'A' Steam Generator due to the large pressure transient. (No change in EAL status) 'A' CV Spray pump will fail to start. Efforts to repair this pump will be unsuccessful. AFW Valve V2-16A will fail to close resulting in over-feed of the faulted S/G in the CV from the MDAFW Pumps.

An AO mission will be dispatched to open the breaker for V2-16A and manually close the valve.

A high priority mission (2) should be requested to restore the CV Spray Pump (electrical)

An AO mission will be dispatched for S/G isolation using Supplement G. (two AOs, one inside and one outside)

A low priority (3) mission for repair of V2-16A may be dispatched. This valve would normally be isolated on a faulted S/G, therefore repair is not required.

0915 Fracture growth will occur inside containment on Loop 1 (A) Cold Leg due to excessive cooldown. The leak at approximately 25 gpm will be masked due to increased containment pressure caused by the steam line break.

0925 A large break LOCA will occur from the fracture growth on Loop 1 (A) Cold Leg. Conditions will exist for the declaration of a **SITE AREA EMERGENCY** due to two fission product barriers breached. 'A' Charging Pump will also be lost at this time.

A missions for local alignment for recirculation will be dispatched when RWST level reaches 27%. CRSS may elect to pre-stage these personnel in anticipation of commencing.

Mission for repair of Charging Pump may be dispatched, dependent on resources. This is a low priority (3) mission that should not be performed if other actions are needed. (Charging Pumps are secured during RWST switchover and isolated.)

Request for H2 Recombiners should be made from TSC to EOF for call to Duke. (step in EOPs)

0940 A **SITE AREA EMERGENCY** should be declared due to two fission product barriers breached.

1030 CV Vacuum relief valve will begin to leak by at a low rate.

A message will be received from the field of a loud hissing noise near the purge inlet room. (Release pathway) The leak from the vacuum relief valve will escalate resulting in a catastrophic failure. The failure of the vacuum relief valve will result in the loss of the third fission product barrier.

A high priority (1) mission should be dispatched to repair the breached barrier.

1045 A **GENERAL EMERGENCY** should be declared based on the loss of three fission product barriers. A priority one mission should be dispatched to stop the leak.

The loss of the third fission barrier will result in a release offsite. The release offsite will impact portions of both Darlington County and Chesterfield County. The major portion of the release will be found in Chesterfield County within the ten-mile area surrounding the HBRSEP. HBRSEP Environmental Monitoring Teams will monitor radiological conditions from the plant out to ten miles and determine the activity.

1300 The exercise will be terminated. Termination may occur sooner if State/County objectives are completed.

Biennial NRC Evaluated Exercise Scenario Timeline

CLOCK	T=TIME	EVENT DESCRIPTION	SIMULATOR INSTRUCTIONS	DRILL MESSAGE	EXPECTED ACTIONS
0700		Crew Briefing			Review turnover information 1. Intermittent Loose Part Monitoring System Alarms. Data has been sent to Westinghouse for analysis. 2. The Load Dispatcher notified the previous shift of grid instabilities.
~0715		Crew performs walk down of board.			
~0720	T=0	Crew assumes the watch			
~0725	T=5	**EVENT 1** **LPMS alarm**	**IOR XN36I04 (None 0 0)** **ALARM ON**		Dispatch STA or System Engineer to investigate.
~0740	T=20	**EVENT 2** Radiation Monitor R-9 increases to > 500 mr/hr		**Message Card A** STA, AO, or System Engineer reports multiple events on channel 752 > alarm setpoint and audible indication of a loose part.	
~0745	T=25			**Message Card B** Chemistry reports results of RCS sample.	

Biennial NRC Evaluated Exercise Scenario Timeline

CLOCK	T=TIME	EVENT DESCRIPTION	SIMULATOR INSTRUCTIONS	DRILL MESSAGE	EXPECTED ACTIONS
0755	T=35	Conditions will be met for the declaration of an **UNUSUAL EVENT.**		**Contingency Message Card**	Review EALs. Declare event. Time _____ Notify personnel. Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
~0815	T=55	**EVENT 3** Grid Instabilities resulting in a Loss of Offsite Power and Reactor Trip.	**MRF EPS033 (None 0) TRIPPED** **MRF EPS035 (None 0) TRIPPED** **MRF EPS038 (None 0)**		
~0820	T=60	Letdown Line Radiation Monitor R-9 will increase to greater than 5000 mRem/hr in 30 minutes	**IFP JMLRTC2 TRUE** **IFP SMLRTC2 0.0003 0**		Respond to event.
~0825	T=65	Conditions will be met for the declaration of an **ALERT.**			Review EALs. Declare event. Time _____ Notify personnel. Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
~0830	T=70	Steam Driven AFW Pump Mission may be dispatched.	**IMF GEN03A (None 0 0) 2.000** **IOR XDDO071C (None 0 0) OFF** **IOR XDDO071T (None 0 0) OFF** **IMF GEN03B (None 0 0) 2.000** **IOR XDDO070C (None 0 0) OFF** **IOR XDDO070T (None 0 0) OFF**		Perform PATH 1 Immediate Actions

Biennial NRC Evaluated Exercise Scenario Timeline

LOCK	T=TIME	EVENT DESCRIPTION	SIMULATOR INSTRUCTIONS	DRILL MESSAGE	EXPECTED ACTIONS
-0840	T=80	Declare **ALERT** due to one fission product barrier breached based on Radiation Monitor R-9 readings of >5000 mRem/hr in 30 minutes.		**Contingency Message Card**	Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
-0850	T=90	**EVENT 4** "A" S/G faulted in Containment.	**IMF MSS11A (None 0 0) 1.5E + 06 2:00 Asls** **IMF CNS02A (None 0 0**		Diagnose Event IAW applicable procedures.
-0855	T=95	CV Spray Pump trips on overcurrent			
-0900	T=100	V2-16A fails to close from the RTGB	**MRF EPS255 (None 0) RACK_OUT** **MRF EPS264 (None 0) RACK_OUT** **MRF CFW009 (None 0) 0 1:00**		Dispatch AO to open the breaker and close the valve manually
-0905	T=105		**MRF MSS047 (None 0) 0 0** **MRF EPS255(None 0)RACK_OUT** **MRF EPS262(None 0)RACK_OUT** **MRF EPS264(None 0)RACK_OUT** **MRF EPS189(None 0)RACK_OUT**		Supplement "G" to isolate the faulted S/G
			IOR XN08F05 (None 0 0) ALARM_ON		

Biennial NRC Evaluated Exercise Scenario Timeline

CLOCK	T=TIME	EVENT DESCRIPTION	SIMULATOR INSTRUCTIONS	DRILL MESSAGE	EXPECTED ACTIONS
0915	T=115	EVENT 5 – RCS Leak – 25 gpm	**IMF RCS09A (None 0 0) 25 0 10**		Crew may or may not identify due to the plant status. If SI has not been terminated or if RCS temperature is unstable, this small leak may be difficult to detect.
~0925	T=125	**EVENT 6** – RCS LBLOCA & Fuel Failure – Small RCS leak increases to LBLOCA with a significant increase in Fuel Failure	**IMF RCS01A (None 0 0) 100 10 Asls** **FMP SMLRTC2 0.008 15.00**		Diagnose Event The crew will perform actions of PATH 1 to mitigate LOCA then transition to EPP-9, Transfer to Cold Leg Recirculation
~0940	T=140	Two missions will be dispatched for EPP-9 local actions for switchover. Time is dependent on draindrown of RWST.			
		Conditions will be met for the declaration of a **SITE AREA EMERGENCY**			Review EALs. Declare event. Time _____ Notify personnel. Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
~0940	T=140	Declare **SITE AREA EMERGENCY** due to two fission product barriers breached/RCS leakage greater than Charging capability.		**Contingency Message Card**	Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____

Biennial NRC Evaluated Exercise Scenario Timeline

CLOCK	T=TIME	EVENT DESCRIPTION	SIMULATOR INSTRUCTIONS	DRILL MESSAGE	EXPECTED ACTIONS
~0945	T=145	A Charging Pump fails		**Message Card**	TSC/OSC will be expected to prioritize critical missions
~1030	T=190	EVENT 7 – CV Vacuum Relief Valves Fail OPEN – Containment Breached	**IFP JMLCNM07 TRUE** **IFP SMLCNM07 0.5** **IFP JMLCNM08 TRUE** **IFP SMLCNM08 0.5**	**Message Cards G and H** Messages from various areas in the plant report a loud hissing noise coming from the Purge Inlet Room.	Review EALs. Declare event. Time _____ Notify personnel. Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
1045	T=205	Declare **GENERAL EMERGENCY** due to three fission product barriers breached.		**Contingency Message Card**	Complete ENF activities. ***Notification must be completed within 15 minutes of declaration.*** Time _____
1100	T=215	Offsite monitoring by field teams will confirm dose projections			
1115	T=230	Priority 1 Mission dispatch to stop the release.			
1300	T=335	The exercise will be terminated. Termination may occur sooner if State/County Objectives are completed.			

APPENDIX 5.

MEDICAL SERVICES DRILL

H. B. Robinson Nuclear Station

Medical Drill

October 10, 2001

Carolina Pines Regional Medical Center, (Darlington County, South Carolina)

On October 10, 2001, a medical services drill was conducted to evaluate the response of the Darlington County Emergency Medical Services (EMS) and the Carolina Pines Regional Medical Center. Emergency Preparedness Division personnel and the Darlington County Emergency Management Director participated in the drill.

The drill began at 0838 when the Darlington County EMS ambulance was dispatched to Byrdtown Fire Station #12 for a patient that had fallen from a four-wheel all terrain vehicle in an area suspected to have radioactive contamination. The ambulance arrived at 0855, two paramedics, wearing appropriate protective clothing and dosimetry; monitored the area and victim for radiological contamination using a Ludlum Model 3 survey meter. Sheets were placed on the ground at the rear of the ambulance and next to the patient. The paramedics then assessed and treated the patient's injuries. The patient's outer clothing was removed and the patient was placed on a backboard, wrapped in sheets to contain contamination and loaded into the ambulance at 0905. The interior of the ambulance had been covered to prevent it from becoming contaminated. Communication was established with the hospital and maintained during transport. Contamination control during the pick-up was excellent.

When the ambulance arrived at Carolina Pines Regional Medical Center, the radiological response team (RRT) had prepared a receiving area to isolate and transfer the contaminated patient. A health physicist (HP) surveyed the patient who was then moved inside to a treatment room. The EMS crew was properly surveyed and demonstrated appropriate exit procedures. They knew where to go and what to do if the ambulance or they were contaminated.

Once inside the treatment room, the HP again monitored the patient while the RRT doctor and two nurses began examining the patient's wounds. Decontamination was begun almost immediately. Bandages, placed on the wounds before transport, were removed and the areas flushed with saline to remove contamination. Samples from the ears and nose were sent for laboratory analysis. After the patient had been decontaminated he was taken from the treatment room in a wheel chair and the RRT demonstrated proper exit procedures.

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

a. MET: Objectives 5, 20 and 21

b. DEFICIENCY: NONE

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

d. **NOT DEMONSTRATED:** NONE

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

f. **PRIOR ARCAs – UNRESOLVED:** NONE