

# H. B. Robinson Steam Electric Plant Exercise—May 19, 2009

Final Report - Radiological Emergency Preparedness Program

*August 11, 2009*



**FEMA**

*FEMA Region IV*





# FEMA

## **Final Exercise Report**

### **H. B. Robinson Steam Electric Plant**

Licensee: **Progress Energy**

Exercise Date: **May 19, 2009**

Report Date: **August 11, 2009**

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**U.S. DEPARTMENT OF HOMELAND SECURITY  
FEDERAL EMERGENCY MANAGEMENT AGENCY  
REGION IV**

**3003 Chamblee Tucker Road  
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## 1. EXECUTIVE SUMMARY

On May 19, 2009, the Department of Homeland Security, Federal Emergency Management Agency (FEMA), Region IV, Radiological Emergency Preparedness (REP) Program staff evaluated a plume exposure pathway exercise in the emergency planning zone (EPZ) around the H. B. Robinson Steam Electric Plant (HBRSEP). As part of this exercise all activities were evaluated the day of the exercise except the Medical Drill which was evaluated on May 20, 2009 at the Carolina Pines Regional Medical Center.

The purpose of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency. This exercise was held in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans and procedures. The previous federally evaluated exercise was conducted on December 4, 2007. The qualifying emergency preparedness exercise was conducted March 11-12, 1981.

FEMA would like to recognize the work and effort put into this exercise by the many individuals, agencies, and volunteers in the State of South Carolina, the Risk Counties of Chesterfield, Darlington, and Lee and the Host County of Florence. The actions taken by the State and Darlington County to simultaneously handle protective actions for two separate incidents at the same time was commendable. A simulated chlorine leak that was intended to be a minor distraction became a major incident that required the State and County leaders to consider alternative actions and precautions to their normal responses.

State and local organizations (except where noted) demonstrated knowledge of their emergency response plans and procedures and successfully implemented them. No Deficiencies were identified. However, three Areas Requiring Corrective Actions (ARCA) were identified as follows: SCEMD emergency workers dispatched to the Emergency Operations Facility (EOF) were not issued dosimetry prior to entering the 10- mile EPZ; neither the Department of Natural Resources (DNR) nor the Darlington County Sheriffs Department have in place procedures that assure DNR obtained 800 MHz radios before deployment to their assignment for Lake Clearing; and, the Chesterfield County Sheriff Deputy did not receive a thorough radiological briefing prior to deployment, however, this ARCA was successfully re-demonstrated. FEMA has received South Carolina's schedule of corrective actions and the ARCAs assessed against the State and Darlington County will be re-demonstrated during the May 24, 2011 HBRSEP FEMA evaluated exercise. The three ARCAs identified during the 2007 H.B. Robinson exercise have been resolved. The resolved ARCAs are as follows: A misunderstanding of the agreed upon procedures for activating the EAS system between the State and the LP-1 Radio Station – corrected during the Oconee Nuclear Plant exercise in April 2008; procedural compliance at the Carolina Pines Regional Medical Center – corrected during the Medical Services Drill in November 2008; and, unilateral decision making in Lee County – successfully demonstrated during this exercise. The correction of an ARCA identified during the June 2008 Catawba exercise concerning improper control and direction of field monitoring teams by the South Carolina Department of Health and Environmental Control Mobile Operations Center was successfully demonstrated during this exercise.

## II. INTRODUCTION

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead responsibility for all offsite nuclear planning and response. FEMA became a part of the Department of Homeland Security with its creation in 2002. The Radiological Emergency Preparedness (REP) Program conducts its activities pursuant to Title 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the 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 the REP Program's initial and continued approval of State and local governments' radiological emergency planning and preparedness for commercial nuclear power plants. This approval is contingent, in part, on State and local government participation in joint exercises with licensees.

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

- Taking the lead in offsite emergency planning and in the review and evaluation of radiological emergency response plans (RERP) 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 from the Nuclear Regulatory Commission (NRC) to the REP Program 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 Homeland Security
  - Department of the Interior
  - Department of Transportation
  - Environmental Protection Agency
  - Food and Drug Administration and
  - Nuclear Regulatory Commission.

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

Formal submission of the Radiological Emergency Response Plans (RERP) for the H. B. Robinson Steam Electric Plant to FEMA 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 evaluated on May 19, 2009, and included evaluation of an out-of-sequence Medical Drill on May 20, 2009. FEMA assessed the capabilities of State and local emergency preparedness organizations to implement their RERPs and procedures to protect the public health and safety during a radiological emergency involving the H. B. Robinson Steam Electric Plant. This report presents the results of the exercise and findings on the performance by 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 being made by the RAC Chair and final approval by the FEMA Region IV Regional Administrator.

The criteria utilized in the 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 “Interim Radiological Emergency Preparedness Manual,” dated August 2002.

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

Section IV, entitled “Exercise Evaluation and Results,” presents summary information on the demonstration of applicable exercise criteria at each jurisdiction or functional entity evaluated in a results only format.

### **III. EXERCISE OVERVIEW**

This section contains data and basic information relevant to the May 19, 2009 exercise and out-of-sequence activity that occurred during the exercise week. The purpose of the exercise was to test Federal, State and local response capabilities in the area surrounding the H. B. Robinson Steam Electric Plant (HBRSEP).

#### **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 May 19, 2009.

#### **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  
First Health of the Carolinas Emergency Medical Services  
Radio Amateur Civil Emergency Service (RACES)  
Volunteer Fire Departments: Chesterfield, Brockmill, Tealsmill, Patrick,  
Alligator and Sandhill  
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 May 19, 2009. Also included are times notifications were made to the participating jurisdictions/functional entities.

**Table 1. Exercise Timeline**

**DATE AND SITE:** May 19, 2009 – H. B. Robinson Steam Electric Plant

Emergency Classification Level or Event		Time Utility Declared	Time That Notification Was Received or Action Was Taken					
SEOC	DHEC/ MOC	JIC	CHESTERFIELD COUNTY	DARLINGTON COUNTY	LEE COUNTY			
Unusual Event	0832	----	0826	0826	0829			
Alert	0910	0920	0910	0909	0909			
Site Area Emergency	1102	1053	1058	1059	1059			
General Emergency	1221	1210	1217	1217	1217			
Simulated Rad. Release Started	1221	1106/1210	1200	1208	----			
Simulated Rad. Release Terminated	Ongoing	----	Ongoing	Ongoing	----			
Facility Declared Operational	0938	1051	0935	0920	1048			
Declaration of State of Emergency State	1109	1118	1136	1125	1127			
Local	----	----	1205	1133	----			
Exercise Terminated	1330	1334	1334	1321	1330			
Early Precautionary Actions:	----	----	0918	0920	N/A			
Evacuate Schools	1127	----	----	1127	----			
Lake Clearing	1127	1210	1211	1127	----			
Agriculture advisory to 5-miles	1246	1315	----	----	----			
Agriculture advisory to 10-miles	1127	1130	1130	1130	1130			
1st Protective Action Decision Stay Tuned	1135	1135	1135	1135	1135			
1st Siren Activation	1140	1140	1140	1140	1140			
1st EAS Message	1246	1240	1251	1245	1253			
2nd Protective Action Decision:	1255	1240	1255	1255	1255			
Evacuate: A0, C1, C2, D1, D2 Shelter: A1, A2, B1, B2, E1, E2	1300	1300	1300	1300	1300			
2nd Siren Activation	1315	----	----	----	----			
2nd EAS Message	1246	1255	1251	1220/1245	1253			
3rd Protective Action Decision:								
Add B1 to evacuation order and Carolina Pines Regional Hospital								
KI: Distribute to Emergency Workers								

## IV. EXERCISE EVALUATION AND RESULTS

This section contains the results and preliminary findings of the evaluation for all jurisdictions and functional entities that participated in the exercise on May 19, 2009 and the out of sequence activity during the exercise week. The exercise tested the offsite emergency response capabilities of State and local governments within the 10-mile EPZ around the H. B. Robinson Steam Electric Plant.

Each jurisdiction and functional entity was evaluated based on their demonstration of criteria as delineated in REP Exercise Evaluation Methodology, dated August 2002. Detailed information on the exercise criteria and the extent-of-play agreement used are found in Appendix 3 of this report.

### A. Table 2: Summary of Results of Exercise Evaluation

The matrix presented in Table 2, on the following page, presents the status of all exercise criteria that were scheduled for demonstration during this exercise, by all participating jurisdictions and functional entities. Exercise criteria are listed by number. 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:** May 19, 2009 – H. B. Robinson Steam Electric Plant

ELEMENT/Sub-Element	SEOC	DHEC/ MOC	EOF	CHESTERFIELD COUNTY	DARLINGTON COUNTY	LEE COUNTY	FLORENCE COUNTY
<b>1. EMERGENCY OPERATIONS MANAGEMENT</b>							
1.a.1. Mobilization	M	M	M	M			
1.b.1. Facilities						M	
1.c.1. Direction and Control	M	M	M	M	M		
1.d.1. Communications Equipment	M	M	M	M	A	M	
1.e.1. Equipment & Supplies to Support Operations	M	M	M	M	M	M	M
<b>2. PROTECTIVE ACTION DECISION MAKING</b>							
2.a.1. Emergency Worker Exposure Control	A	M		M			
2.b.1. Rad Assessment & PARs & PADs Based on Available Info	M		M	M			
2.b.2. Rad Assessment and PARs and PADs for the General Public	M			M	M		
2.c.1. Protective Action Decisions for Special Populations				M	M		
2.d.1. Rad Assessment & Decision Making for Ingestion Exposure							
2.e.1. Rad Assessment & Decision Making for Relocation, Re-entry & Return							
<b>3. PROTECTIVE ACTION IMPLEMENTATION</b>							
3.a.1. Implementation of Emergency Worker Control		M			M	M	M
3.b.1. Implementation of KI Decisions					M	M	
3.c.1. Implementation of PADs for Special Populations					M	M	
3.c.2. Implementation of PADs for Schools							
3.d.1. Implementation of Traffic and Access Control	M			M	M		
3.d.2. Impediments to Evacuation and Traffic and Access Control	M			M	M		
3.e.1. Implementation of Ingestion Decisions Using Adequate Info							
3.e.2. Implementation of IP Decisions Showing Strategies & Instructional Materials							
3.f.1. Implementation of Relocation, Re-entry and Return Decisions							
<b>4. FIELD MEASUREMENT and ANALYSIS</b>							
4.a.1. Plume Phase Field Measurement & Analysis Equipment	M	M					
4.a.2. Plume Phase Field Measurement & Analysis Management	M	M					
4.a.3. Plume Phase Field Measurements & Analysis Procedures	M	M					
4.b.1. Post Plume Field Measurement & Analysis							
4.c.1. Laboratory Operations		M					
<b>5. EMERGENCY NOTIFICATION &amp; PUBLIC INFO</b>							
5.a.1. Activation of Prompt Alert and Notification	M			M	M		
5.a.2. [Reserved]							
5.a.3. Activation of Prompt Alert & Notification Backup Alert & Notification							
5.b.1. Emergency Info and Instructions for the Public and the Media	M			M	M		
<b>6. SUPPORT OPERATIONS/FACILITIES</b>							
6.a.1. Monitoring and Decon of Evacuees and EWs & Registration of Evacuees					M	M	M
6.b.1. Monitoring and Decon of Emergency Worker Equipment					M	M	
6.c.1. Temporary Care of Evacuees					M	M	M
6.d.1. Transport and Treatment of Contaminated Injured Individuals							

**LEGEND:** M = Met D = Deficiency N = Not Demonstrated

A = ARCA

\*ARCA identified, corrected during exercise.

## B. Status of Jurisdictions Evaluated

This subsection provides information on the evaluation of each participating jurisdiction and functional entity in a jurisdictional results based format. Presented below is a definition of the terms used in this subsection relative to Criterion 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 criterion 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 criterion 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 ARCA 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** – Description(s) of ARCA(s) assessed during previous exercises, which were resolved in this exercise and the corrective actions demonstrated.
- **Prior ARCAs - Unresolved** – Description(s) of ARCA(s) 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 may be discussed in this report.

- A **Deficiency** is defined in the REP Manual 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 the REP Manual 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."

# 1. STATE OF SOUTH CAROLINA

## 1.1 State Emergency Operations Center

The Operation's Chief and Nuclear Operations Information Officer provided overall command and control throughout the exercise. They conducted briefings and coordinated all decisions with other agencies and affected counties. The Operation's Chief and all State Emergency Operations Center (SEOC) staff agencies handled both an ongoing simulated chlorine leak and their response to the events at HBRSEP. Agencies were proactive and derived alternate plans for possible evacuations and plant support. All protective action decisions (PAD) were coordinated with the counties, and protective actions were modified after discussing the situation with the counties. The SEOC Public Information Officer (PIO) successfully coordinated the initiation and dissemination of timely and accurate information to the Emergency Alert System (EAS) station and the Joint Information Center (JIC).

- a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 5.a.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

## 1.2 Dose Assessment

The State of South Carolina Department of Health and Environmental Control (DHEC) dose assessment staff routinely monitored and evaluated plant, radiological, and meteorological data. DHEC performed dose projections to determine worst case scenarios. All dose projections were made in collaboration with utility counterparts. The Emergency Response Coordinator (ERC) provided effective updates in frequent SEOC briefings, including timely precautionary actions and PARs. The ERC was proactive in requesting assistance through the States of North Carolina and Georgia via the Southern Mutual Radiological Assistance Plan (SMRAP), Department of Energy (DOE) Radiological Assistance Program (RAP), and Federal Radiological Monitoring and Assessment Center (FRMAC). Professional conduct, competence and dedication were apparent in the execution of dose assessment staff responsibilities. In addition to their normal radiological function, DHEC staff responded to a chlorine release that occurred early in the exercise. The DHEC staff effectively addressed the simultaneous radiological and chemical events to ensure the safety and health of the public and emergency workers in affected areas.

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

### 1.3 Department of Health and Environmental Control Mobile Operations Center

The Mobile Operations Center (MOC) was staffed with well trained and talented professional individuals from DHEC. Good command and control was demonstrated by the MOC Director in analyzing problems in the facility and coming up with solutions for moving the Field Monitoring Teams (FMT) around a chlorine spill. The FMTs received a thorough briefing prior to dispatch which also informed other staff of current conditions. The staff was kept focused on the primary task of supplying radiological data from the field teams to the Dose Assessment personnel in the SEOC. Excellent team work was demonstrated between the MOC Director and his staff, especially the FMTs communicators who continuously supplied up to date data concerning wind direction and plant status to the FMTs while recording locations and field reading for the MOC Director. The Mobile Laboratory showed considerable improvement in equipment, and procedures for accepting, monitoring, preparing, and counting field samples. The laboratory personnel were well trained and completed all tasks in accordance with their procedures.

- a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 4.a.2 and 4.c.1
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs - RESOLVED:**

**Issue No:** 012-08-4.a.2/4.a.3-A-01

**Description:** In accordance with the extent of play agreement South Carolina DHEC deployed the MOC and two FMTs to monitor the plume. The MOC's mission was to provide direction and control for the FMTs and monitor their activities. MOC personnel did not properly implement their mission requirements

in that they did not inform the FMTs of a radioactive release, the general meteorological conditions or a predictive forecast and did not provide directions to the FMT that enabled them to identify the plume.

During the plume phase of the exercise the MOC directed the FMTs to take “baseline grass samples.” FMT personnel exited their vehicles and obtained grass samples. However, they did not take a survey instrument with them and failed to take any radiation surveys. According to the scenario the plume passed over the FMTs location while they were obtaining the grass samples, but the FMT personnel were unaware of its passage because of the lack of survey instruments. During the plume phase of the exercise the FMTs did not take any radiation surveys and were not requested to do so by MOC personnel. MOC personnel did not direct the FMTs to take an air sample, so the state could not determine from field samples whether radioiodine or other radioactive particulates were in make up of the plume. During the plume phase of the exercise MOC personnel did not ask for any FMTs data.

The Emergency Response Coordinator (ERC) used the 800 MHz radio to transmit instructions for emergency workers to ingest potassium iodide (KI) to the MOC. The ERC also posted the instruction for emergency workers to ingest KI on WebEOC. However, the information was not made known to the MOC field recorder and therefore the FMTs were not instructed to take KI.

**Corrective Action Demonstrated:** The FMTs were dispatched into the field at 1134 from the MOC after a complete briefing on plant conditions, field conditions, wind direction, and safety by the MOC Director, with specific routes to drive to circumvent the first radiological release and the remains of a chlorine spill near the plant. The briefing covered the personnel exposure limits, and other safety aspects of working in the field and dealing with KI, especially if you are allergic to shell fish. When the teams left the MOC they turned on their survey meters and kept them on until they returned to the MOC. All survey results from the FMTs were reported to the MOC and recorded on exposure control forms. When the release started from the plant the MOC Director moved the teams around so that they could traverse the plume several miles out to come up with the highest readings and ascertain the centerline of the plume. During the release there were at least three wind shifts that were reported to the MOC and then broadcast to the teams over the radio. The wind shifts required the MOC Director to move the FMTs to find the highest centerline readings and continue to traverse the plume. The MOC Director directed the FMTs to look for increasing exposure readings on their meters. The SEOC had overall authority for exposure control of emergency workers.

When the FMTs found an appropriate high level of exposure the MOC Director had the teams stop and take an air sample. The MOC Director ordered air samples be taken in the field by the FMTs and transferred to the Mobile Lab for counting. The results of the FMTs air samples were called into the MOC and an

air concentration was determined by the MOC Director and his staff using Procedure 7.3 Air Sampling Procedure.

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

## 1.4 Radiological Field Monitoring Teams

The State of South Carolina dispatched two FMTs comprised of employees from South Carolina DHEC. FMTs were pre-positioned at South Carolina National Guard Armory in Darlington, South Carolina. FMT members demonstrated surveying methods and sampling techniques to accurately identify the plume for this exercise. Ample equipment and supplies were available to characterize the release. Exposure control was well maintained and monitored. Personnel displayed teamwork and cooperation in their participation for this exercise.

- a. **MET:** Criteria 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.2 and 4.a.3
- 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 HBRSEP Emergency Operations Facility (EOF) is located on site and provides a working area for the State liaisons. Representatives from South Carolina Emergency Management Division (SCEMD) and DHEC served as liaisons with the licensee. The representatives from SCEMD sat in the main EOF room and the DHEC liaison sat with the dose assessment staff in a separate room. Communications between the State and utility operator were good; however, provision of radiological data seemed to be slow. The State representatives were well trained and provided a good conduit of information. The SCEMD representatives did not have dosimetry with them.

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

**Issue No:** 54-09-2.a.1-A-01

**Condition:** The HBRSEP EOF is located on site. The SCEMD representatives, as emergency workers inside the 10-mile EPZ, need dosimetry to monitor possible radiological exposure.

**Possible Cause:** Failure to have pre-deployment procedures to ensure that dosimetry was picked up prior to entering the 10-mile EPZ.

**Reference:** NUREG-0654/FEMA-REP-1, Rev1, K.3.b, South Carolina Operational Radiological Preparedness Plan (SCORERP), Section IV.7.e and Annex F.

**Effect:** The SCEMD staff needs to be able to monitor their exposure levels and possible impact from the environment at the plant site, so they can determine what actions they need to take and whether additional staff will be sent to the EOF to replace them.

**Recommendation:** Develop pre-deployment procedures to ensure that dosimetry is picked up prior to entering the 10-mile EPZ.

**Schedule of Corrective Actions:** The SCEMD procedures for representatives responding to HBRSEP EOF are being revised to ensure representatives have appropriate dosimetry to monitor possible radiological exposure. SCEMD will demonstrate revised procedures during the May 24, 2011 HBRSEP FEMA evaluated exercise.

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

## 1.6 Joint Information Center

The JIC successfully demonstrated the ability to distribute emergency information and instructions to the public in a timely manner. The JIC was staffed and managed by an effective public information cadre. News releases were distributed to the media efficiently, and media briefings conducted in a commendable manner. Television and radio broadcasts were effectively monitored. The Public Inquiry activity was conducted effectively.

- a. **MET:** Criteria 1.a.1, 1.d.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

## 1.7 LP-1 Radio Station - WJMX

The designated LP-1 radio station, WJMX (103.3 FM), demonstrated the capability to receive, authenticate, and broadcast EAS messages in a timely manner. The station received an EAS message via fax from the SEOC at 1135 hours. The SEOC called to verify receipt of the message and instructed the station to broadcast the message at 1140 hours. The station authenticated the message and simulated the broadcast at 1140 hours. The station has six sister stations that rebroadcast EAS messages over different AM and FM frequencies. The station has broadcast interrupters that allow the SEOC and/or County EOCs to activate the EAS messages directly when the station is not staffed.

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

**Issue No:** 54-07-1.c.1-A-03

**Description:** Procedural misunderstanding between the SEOC and WJMX radio station and equipment setup problems at the radio station lead to a 22-minute delay in the attempted broadcast of the initial EAS message. Although the radio station completed their procedures the EAS message was never actually broadcast outside of the radio station broadcast booth.

**Corrective Action Demonstrated:** Proper activation of the EAS system was demonstrated at the Oconee Nuclear Plant exercise on April 1, 2008. This action corrected the finding in the prior ARCA.

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

## 1.8 State Traffic Control Point

Two South Carolina Highway Patrol Troopers demonstrated the ability to maintain the flow of traffic and limit access to specific areas at Traffic Control Point (TCP) 16-A. The troopers obtained a pre-assembled TCP kit that includes instructions, dosimetry and KI at

the Darlington County Emergency Operations Centers (EOC) and were familiar with the instructions and the dosimetry. They were also issued RAD-60 digital pocket alarm standalone dosimeters at the troop barracks. The troopers stated they would request any needed traffic control equipment from the State Department of Transportation (DOT), and that local towing authorities would be contacted through their dispatch center to remove any impediments to the flow of traffic. Each vehicle is equipped with State and County radio systems, and each trooper has a portable radio and cell phone.

- a. **MET:** Criteria 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1 and 3.d.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. RISK JURISDICTIONS**

### **2.1 CHESTERFIELD COUNTY**

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

The Emergency Management Services Director displayed excellent control and direction of the Chesterfield County EOC. EOC representatives were professional in their approach to tasks, fully conversant with plans and procedures, and proactive in their implementation. The full participation by a County Commissioner was acknowledgement of the county leadership's commitment to understanding emergency response procedures and improving response capability. Particularly commendable was how the Director questioned the PAR to evacuate a zone in Chesterfield County, and requested the SEOC confirm the accuracy. All personnel in the EOC performed professionally and displayed excellent teamwork.

- a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.d.1, 3.d.2, 5.a.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**

### 2.1.2 Protective Actions for Schools

The Chesterfield County School Superintendent demonstrated excellent knowledge and ability to assure the safety of the students and staff of the McBee High School, McBee Elementary School and the Plain View Elementary School. The two McBee schools are located close together and buses serving one could be used to support the other. Eight school buses and four “activity” buses are available for transporting students from these two schools. The Plain View Elementary school is served by three large buses and one handicap van. Buses are normally parked on the school grounds and additional buses, if necessary, could be obtained from nearby schools outside the EPZ. The Superintendent was fully conversant with his responsibilities and emergency plans and prepared to implement these, if required.

- 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**

### 2.1.3 Traffic Control Points

A County Sheriff’s Department Deputy demonstrated TCP set-up and operation by interview at the Chesterfield County EOC. Upon initial interview he was found to be lacking in knowledge of his issued dosimetry equipment and recording procedures. It was determined that he had not received the radiological briefing given to other emergency workers by the Radiological Officer (RO) for Chesterfield County. The Deputy was afforded the opportunity to obtain a thorough radiological briefing by the RO and he subsequently demonstrated this criterion. The Deputy displayed a commendable dedication to the safety and protection of the public during this demonstration.

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

**Issue No: 054-09-3.a.1-A-02**

**Condition:** Prior to deployment the Deputy did not receive a thorough radiological briefing. He was not familiar with the purpose or dosage of KI or its adverse reaction in people with certain conditions. He was not familiar with administrative or turn-back values.

**Possible Cause:** The RO, who normally would have given the radiological briefing, had deployed to the Reception and Congregate Care Center. His replacement at the EOC did not give a radiological briefing when he issued the Deputy the dosimetry equipment. After the original briefing, the radiological officer was called to the scene of a decontamination demonstration. He failed to return in time to offer a briefing to the Deputy assigned this task.

**Reference:** NUREG-0654, K.3.a, b

**Effect:** The Deputy was unfamiliar with procedures that would have assisted him in limiting his personal exposure. His failure to follow these procedures could result in excessive radiological exposure.

**Corrective Action Demonstrated:** The Emergency Management Director summoned the RO to provide a radiological briefing to the Deputy. After the RO's briefing, the Deputy displayed a sufficient knowledge of his equipment to properly read and record readings as instructed every fifteen minutes. He was aware that he was to call in to the EOC with any change in reading, was knowledgeable about KI and its purpose, and that he was subject to a limit of 1 R. He was familiar with protective measures and demonstrated an ability to limit his exposure sufficiently.

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

#### 2.1.4 Emergency Worker Decontamination

The First Health of the Carolinas Emergency Medical Services (EMS), augmented when necessary by Chesterfield, Brockmill, Tealsmill, Patrick, Alligator and Sandhill Volunteer Fire Departments successfully demonstrated emergency worker and equipment monitoring and decontamination procedures at the Chesterfield High School. The facility was set up with decontamination tents, signs, barriers and plastic cones. Areas for entering, vehicle registration, monitoring, and decontamination of vehicles and personnel were clearly identified. The emergency workers demonstrated good contamination control measures, monitoring and decontamination techniques, and were well trained and competent.

- a. **MET:** Criteria 1.e.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**

### **2.1.5 Reception and Congregate Care**

Members of the Chesterfield County Reception and Congregate Care Center (RCCC) successfully demonstrated their ability to monitor evacuees, vehicles and emergency workers at the Chesterfield County High School. The monitoring and decontamination personnel wore appropriate direct-reading and permanent dosimetry and reception center personnel prepared the necessary paperwork for evacuees to be processed for congregate care. Personnel were knowledgeable of contamination limits, understood their responsibilities, followed plans, and successfully demonstrated their ability to monitor evacuees and emergency workers and vehicles. Appropriate records were completed and exercise participants were well equipped, well organized, and displayed a positive attitude throughout the exercise.

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

## **2.2 DARLINGTON COUNTY**

### **2.2.1 Emergency Operations Center**

The EOC was effectively and efficiently managed by the County Emergency Services Director and exhibited outstanding direction and control. The Director was proactive and provided constant guidance that kept the staff abreast of the evolving conditions through a series of staff updates, that capitalized on the expertise of all staff members and included integration of the plant liaison, which aided in timely, well thought out actions. The Director was especially skillful in guiding his staff through adversities and confusion

in managing an initiating event, which was a chlorine spill (simulated) that escalated beyond its intended purpose and posed problems for the staff. He calmly managed this event concurrently with other events occurring during the exercise to resolution without notable disruption and kept the staff focused. All staff members were knowledgeable, and carried out their responsibilities in a professional manner. Darlington County successfully demonstrated their ability to effectively conduct emergency response operations and protect the residents of the county.

- a. **MET:** Criteria 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.c.2, 3.d.1, 3.d.2, 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

## **2.2.2 Protective Actions for Schools**

Interviews were conducted out of sequence with principals and other school officials from the Governor's School of Science and Math, Carolina Elementary School, West Hartsville Elementary School and Emmanuel Christian School. All personnel interviewed were knowledgeable of school district procedures and had individual school policies in place. Procedures included actions to ensure that students with special needs were accommodated. Especially noteworthy was the district's Crisis Management Manual which addressed various emergencies administrators could face and the 'Black Box' that contained plans, medications and necessary supplies and documentation that would go with administrators in the event of an evacuation.

- a. **MET:** Criteria 1.a.1, 3.a.1, 3.b.1 and 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

### 2.2.3 Traffic Control Points

The ability to control the flow of traffic in Darlington County was demonstrated by four officers from the Hartsville Police Department for TCP 16-C and two officers from the Darlington Police Department for TCP 16-G. All officers involved obtained a pre-assembled TCP kit with instructions, dosimetry, and KI at the Darlington County EOC and were knowledgeable in their use. All six vehicles were equipped with push bumpers to assist with traffic impediments, and each police department maintains a list of towing authorities for additional assistance. The Hartsville Police Department maintains their own equipment for traffic control (barricades and cones) and the Darlington Police Department secures equipment from the Darlington County highway department. Each vehicle was equipped with several radios (in the vehicle and portable) capable of maintaining contact with Darlington County as well as their respective agencies and all had cell phones.

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

### 2.2.4 Emergency Worker Decontamination

Monitoring and decontamination of emergency workers and their vehicles and equipment were successfully demonstrated at the Swift Creek Fire Station by a 14-person team comprised of personnel from Darlington County Fire District, EMS, Hartsville Fire District, South Carolina Department of Corrections and Darlington County Hazardous Materials Response Team. The portable decontamination structure (walk thru tent) with shower facilities and drainage efficiently accommodated male and female personnel as well as non-ambulatory persons. The areas established for equipment monitoring and decontamination were quite ample, with room for any needed storage of clean and/or contaminated equipment or clothing. The staff made effective use of procedures, checklists and forms in the accomplishment of their duties.

- a. **MET:** Criteria 1.e.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

Department of Natural Resources (DNR) officers demonstrated this criterion by interview. The officers were cognizant of protective measures used to limit personal exposure. They knew where to report for their radiological briefing and equipment issue. However, they did not possess or have access to 800 MHz radios, their primary means of communications, as required for Law Enforcement responders.

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

**Issue No:** 54-09-1.d.1-A-03

**Condition:** The Darlington County Emergency Operation Plan calls for the Sheriff's Office to provide 800 MHz radios to all law enforcement agencies that respond to assist in the event of an incident at the HBRSEP: (Annex 25 Appendix A; Section V. D.1.a ) (page 43). It also calls for interoperable radio communications between law enforcement agencies. The Department of Natural Resources (DNR) officers had neither handheld or vehicle mounted radios capable of 800 MHz operation. The DNR officers are equipped with VHS radios that serve as their normal primary communications systems and each carry cellular telephones as secondary communications. Upon arrival at the EOC the officers failed to acquire 800 MHz radios and the handheld radios were not included in the kit that was prepared for their use.

**Possible Cause:** Neither the DNR nor the Darlington County Sheriffs Department have in place procedures that assure DNR obtain 800 MHz radios before deployment to their assignment for Lake Clearing.

**Reference:** NUREG-0654, F.1, 2.

**Effect:** The DNR officers had no direct contact with any other agency or with the County EOC without the use of a cellular telephone. There could be an unnecessary delay in relaying information from the field personnel to the EOC. Contact with the EOC necessitates the use of two separate dispatch offices.

**Recommendation:** The Darlington County Sheriff Department and DNR should develop a procedure that assures personnel assigned to Lake Warning are issued 800 MHz radios before they deploy to conduct Lake Warning.

**Schedule of Corrective Actions:** Procedures will be developed for DNR officers to assure officers assigned to Lake Warning are issued 800 MHz radios from Darlington County Sheriff Department prior to their deployment to conduct Lake Warning. DNR will demonstrate this procedure during the May 24, 2011 HBRSEP FEMA evaluated exercise.

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

## 2.2.6 Medical Service Drill

The transportation and treatment of contaminated injured individuals was successfully demonstrated on May 20, 2009 by the Darlington County EMS and by Carolina Pines Regional Medical Center (CPRMC). During this Medical Service (MS-1) Drill, procedures were in place, for both EMS personnel and hospital staff, to ensure that urgent medical care took precedence over patient monitoring and decontamination. Contamination and exposure control were effectively achieved throughout the transportation and treatment process. All participants were very knowledgeable of their responsibilities and worked effectively as a team.

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

**Issue No:** 54-07-6.d.1-A-02

**Description:** The CPRMC Radiological Response Team (RRT) did not effectively establish a radiation emergency area (REA), nor receive and decontaminate a contaminated injured patient. Following training and a re-demonstration, the patient was fully decontaminated prior to proceeding to the emergency room (ER). A dedicated/equipped room for treating a contaminated injured person was not established for treating a contaminated/injured person.

**Corrective Action Demonstrated:** CPRMC participated in an evaluated drill in November 2008 and successfully corrected this ARCA. The Radiation Emergency Area (REA) was established in accordance with CPRMC Emergency Operation Plan, Annex M. This revised guidance clearly identifies that medical treatment takes priority over radiological treatment. Additionally, responsibilities of all RRT members are identified in the procedure.

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

## 2.3 LEE COUNTY

### 2.3.1 Emergency Operations Center

The Coordinator, Lee County Emergency Preparedness Agency successfully demonstrated his ability to provide direction and control, coordination, and efficient management of response activities. Acting on behalf of elected officials he ensured public safety in the multi-county decision process. The staff was kept abreast of the evolving situation through a series of detailed updates provided by the Coordinator and the Progress Energy liaison.

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

**Issue No.:** 54-07-1.c.1-A-03

**Description:** At 1026, after receiving notification at 1025 that the HBRSEP had declared an ECL Alert as of 1015, the Lee County emergency coordinator briefed the EOC staff on the plant status described in the utility's emergency notification form. No protective actions were recommended by the utility. At 1030, without coordination with the SEOC or adjacent jurisdictions, the emergency coordinator decided to initiate a voluntary evacuation of Zone D-2, the only area within Lee County inside the EPZ. The coordinator based his decision on the direction of the wind (330 at 3 mph) which placed Zone D-2 in a projected plume path. He indicated that notification to the 1,297 citizens in Zone D-2 was accomplished by a Reverse 911 telephone calling system – SC Reach; this simulated action was completed by 1045. As a precautionary action at 1030 the Director decided to evacuate those special needs individuals who required transportation. The Department of Social Services (DSS) representative was able to move (simulated)

special needs individuals by 1120 to the appropriate shelter where they received any necessary medical assistance.

At the time the simulated evacuation was ordered, traffic control points had not been established, personnel necessary to activate and staff shelters had not been contacted by the American Red Cross, and Red Cross personnel had not arrived at the EOC to draw materials to support the evacuating citizens. The emergency coordinator did not coordinate this action with either Chesterfield or Darlington Counties or the SEOC; he only used SC Reach to alert and notify the populace; no county news releases were prepared or information pertaining to the evacuation shared with the Joint Information Center (JIC), and this action was not addressed in any of the three media briefings at the JIC.

**Corrective Action Demonstrated:** During this exercise the Emergency Coordinator did not take any independent actions. The utility's protective action recommendation following the declaration of General Emergency recommended that Zone D-2 shelter in place. The Emergency Coordinator, in consultation and concurrence with the state and other risk counties, requested that D-2 be evacuated based on his assessment of the weather and plant conditions.

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

### 2.3.2 Traffic Control Points

Through an interview with the Bishopville Police Department and the County Sheriff's Department, Lee County successfully demonstrated its ability to establish and maintain TCPs. The officers were very professional and well versed in personal radiological exposure control and traffic management. They understood the relationship between their assignment and the assistance of residents and transients evacuating the EPZ.

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 ARCAs - RESOLVED:** NONE

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

### 2.3.3 Emergency Worker Decontamination

Lee County Fire and Rescue Department, Station #1, successfully demonstrated their ability to setup equipment and manage supplies sufficient to support emergency worker and decontamination operations. The well trained fire fighters identified contamination levels, exposure limits, personnel monitoring instructions and vehicle monitoring instructions, including how to operate and read the Ludlum Model 3 meter.

- a. **MET:** Criteria 1.e.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

### 2.3.4 Reception and Congregate Care Center

Representatives from Lee County Emergency Management and the DSS and DHEC successfully demonstrated the monitoring, registration, and decontamination of evacuees at Lee Central High School. The well-trained staff followed their procedures and effectively monitored and decontaminated those evacuees found to be contaminated. Staff was thorough in their monitoring and decontamination surveys. The American Red Cross (ARC) managed the RCCC and their staff was knowledgeable regarding facility set-up and where to request any needed assistance.

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

### **3. HOST JURISDICTION**

#### **3.1 FLORENCE COUNTY**

##### **3.1.1 Reception and Congregate Care**

The Florence City/County Civic Center was the RCCC serving evacuees from designated areas in Darlington County. The Reception Center was staffed by representatives from the DSS and the Congregate Center was managed and staffed by the ARC along with nurses from DHEC. The Florence County Chemical, Ordinance, Biological and Radiological (COBRA) team demonstrated the capability to conduct evacuee monitoring. All staff participating in the exercise carried out assigned functions appropriately and, when questioned about their functions, they displayed a clear understanding of their responsibilities. The ARC representative described an inventory and support system that would insure provision of all necessary supplies and equipment at the Center.

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

##### **3.1.2 Emergency Worker Decontamination**

The Florence County COBRA team conducted emergency worker monitoring and decontamination operations. Dosimetry and radiation monitoring instrument issue and operation were correctly performed. The Ludlum Model-3 instruments and Ludlum Model-52 portal monitor were properly calibrated and utilized effectively for contamination monitoring. Personnel were proficient and well trained, and took care to prevent cross-contamination. The emergency vehicle decontamination area provided for adequate drainage and water runoff. Parking areas were sufficient to segregate contaminated and clean vehicles. Personnel interviewed displayed an understanding of exposure and contamination control measures and exposure reporting requirements.

- a. **MET:** Criteria 1.e.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**

## 4. SUMMARY OF AREAS REQUIRING CORRECTIVE ACTION

### 4.1 2007 ARCAs RESOLVED

- 4.1.1 54-07-1.c.1-A-03**  
**State of South Carolina**  
**LP-1 Radio Station WJMX**
- Description:** Procedural misunderstanding between the SEOC and WJMX radio station and equipment setup problems at the radio station lead to a 22-minute delay in the attempted broadcast of the initial EAS message. Although the radio station completed their procedures the EAS message was never actually broadcast outside of the radio station broadcast booth.
- Corrective Action Demonstrated:** Proper activation of the EAS system was demonstrated at the Oconee Nuclear Plant exercise on April 1, 2008. This action corrected the finding in the prior ARCA.
- 4.1.2 54-07-6.d.1-A-02**  
**Darlington County**  
**Medical Service Drill**
- Description:** The Carolina Pines Regional Medical Center (CPRMC) Radiological Response Team (RRT) did not effectively establish a radiation emergency area (REA), nor receive and decontaminate a contaminated injured patient. Following training and a re-demonstration, the patient was fully decontaminated prior to proceeding to the emergency room (ER). A dedicated/equipped room for treating a contaminated injured person was not established for treating a contaminated/injured person.
- Corrective Action Demonstrated:** Carolina Pines participated in an evaluated drill in November 2008 and successfully corrected the prior ARCA.
- 4.1.3 54-07-1.c.1-A-03**  
**Lee County**  
**EOC**
- Description:** At 1026, after receiving notification at 1025 that the HBRSEP had declared an ECL Alert as of 1015, the Lee County emergency coordinator briefed the EOC staff on the plant status described in the utility's emergency notification form. No protective actions were recommended by

the utility. At 1030, without coordination with the SEOC or adjacent jurisdictions, the emergency coordinator decided to initiate a voluntary evacuation of Zone D-2, the only area within Lee County inside the EPZ. The coordinator based his decision on the direction of the wind (330 at 3 mph) which placed Zone D-2 in a projected plume path. He indicated that notification to the 1,297 citizens in Zone D-2 was accomplished by a Reverse 911 telephone calling system – SC Reach; this simulated action was completed by 1045. As a precautionary action at 1030 the Director decided to evacuate those special needs individuals who required transportation. The Department of Social Services (DSS) representative was able to move (simulated) special needs individuals by 1120 to the appropriate shelter where they received any necessary medical assistance.

At the time the simulated evacuation was ordered, traffic control points had not been established, personnel necessary to activate and staff shelters had not been contacted by the American Red Cross, and Red Cross personnel had not arrived at the EOC to draw materials to support the evacuating citizens. The emergency coordinator did not coordinate this action with either Chesterfield or Darlington Counties or the SEOC; he only used SC Reach to alert and notify the populace; no county news releases were prepared or information pertaining to the evacuation shared with the Joint Information Center (JIC), and this action was not addressed in any of the three media briefings at the JIC.

**Corrective Action Demonstrated:** During this exercise the Emergency Coordinator did not take any independent actions. The utility's protective action recommendation following the declaration of General Emergency recommended that Zone D-2

shelter in place. The Emergency Coordinator, in consultation and concurrence with the state and other risk counties, requested that D-2 be evacuated based on his assessment of the weather and plant conditions.

## 4.2 2008 ARCA RESOLVED

### 4.2.1 012-08-4.a.2/4.a.3-A-01 State of South Carolina DHEC Mobile Operations Center

**Description:** In accordance with the extent of play agreement South Carolina DHEC deployed the MOC and two FMTs to monitor the plume. The MOC's mission was to provide direction and control for the FMTs and monitor their activities. MOC personnel did not properly implement their mission requirements in that they did not inform the FMTs of a radioactive release, the general meteorological conditions or a predictive forecast and did not provide directions to the FMT that enabled them to identify the plume.

During the plume phase of the exercise the MOC directed the FMTs to take "baseline grass samples." FMT personnel exited their vehicles and obtained grass samples. However, they did not take a survey instrument with them and failed to take any radiation surveys. According to the scenario the plume passed over the FMTs location while they were obtaining the grass samples, but the FMT personnel were unaware of its passage because of the lack of survey instruments. During the plume phase of the exercise the FMTs did not take any radiation surveys and were not requested to do so by MOC personnel. MOC personnel did not direct the FMTs to take an air sample, so the state could not determine from field samples whether radioiodine or other radioactive particulates were in make up of the plume. During the plume phase of the exercise MOC personnel did not ask for any FMTs data.

The Emergency Response Coordinator (ERC) used the 800 MHz radio to transmit instructions for emergency workers to ingest potassium iodide (KI) to the MOC. The ERC also posted the instruction for emergency workers to ingest KI on WebEOC. However, the information was not made known to the MOC field recorder and therefore the FMTs were not instructed to take KI.

**Corrective Action Demonstrated:** The FMTs were dispatched into the field at 1134 from the MOC after a complete briefing on plant conditions, field conditions, wind direction, and safety by the MOC Director, with specific routes to drive to circumvent the first radiological release and the remains of a chlorine spill near the plant. The briefing covered the personnel exposure limits, and other safety aspects of working in the field and dealing with KI, especially if you are allergic to shell fish. When the teams left the MOC they turned on their survey meters and kept them on until they returned to the MOC. All survey results from the FMTs were reported to the MOC and recorded on exposure control forms. When the release started from the plant the MOC Director moved the teams around so that they could traverse the plume several miles out to come up with the highest readings and ascertain the centerline of the plume. During the release there were at least three wind shifts that were reported to the MOC and then broadcast to the teams over the radio. The wind shifts required the MOC Director to move the FMTs to find the highest centerline readings and continue to traverse the plume. The MOC Director directed the FMTs to look for increasing exposure readings on their meters. The SEOC had overall authority for exposure control of emergency workers. At 1244, the MOC was directed to distribute KI to emergency workers from the SEOC, but

they were not to ingest KI until instructed. Both FMTs reported they had their KI ready to be taken.

When the FMTs found an appropriate high level of exposure the MOC Director had the teams stop and take an air sample. The MOC Director ordered air samples be taken in the field by both teams and transferred to the Mobile Lab for counting. The results of the FMTs air samples were called into the MOC and an air concentration was determined by the MOC Director and his staff using Procedure 7.3 Air Sampling Procedure.

### 4.3 2009 ARCAs

#### 4.3.1 54-09-3.a.1-A-02 Risk Jurisdictions Chesterfield County TCPs (Resolved)

**Condition:** Prior to deployment the Deputy did not receive a thorough radiological briefing. He was not familiar with the purpose or dosage of KI or its adverse reaction in people with certain conditions. He was not familiar with administrative or turn-back values.

**Possible Cause:** The RO, who normally would have given the radiological briefing, had deployed to the Reception and Congregate Care Center. His replacement at the EOC did not give a radiological briefing when he issued the Deputy the dosimetry equipment. After the original briefing, the radiological officer was called to the scene of a decontamination demonstration. He failed to return in time to offer a briefing to the Deputy assigned this task.

**Reference:** NUREG-0654, K.3.a, b

**Effect:** The Deputy was unfamiliar with procedures that would have assisted him in limiting his personal exposure. His failure to follow these procedures could result in excessive radiological exposure.

**4.3.2 54-09-2.a.1-A-01  
State of South Carolina  
EOF**

**Condition:** The HBRSEP EOF is located on site. The SCEMD representatives, as emergency workers inside the 10-mile EPZ, need dosimetry to monitor possible radiological exposure.

**Possible Cause:** Failure to have pre-deployment procedures to ensure that dosimetry was picked up prior to entering the 10-mile EPZ.

**Reference:** NUREG-0654/FEMA-REP-1, Rev1, K.3.b, South Carolina Operational Radiological Preparedness Plan (SCORERP), Section IV.7.e and Annex F.

**Effect:** The SCEMD staff needs to be able to monitor their exposure levels and possible impact from the environment at the plant site, so they can determine what actions they need to take and whether additional staff will be sent to the EOF to replace them.

**Recommendation:** Develop pre-deployment procedures to ensure that dosimetry is picked up prior to entering the 10-mile EPZ.

**Schedule of Corrective Actions:** The SCEMD procedures for representatives responding to HBRSEP EOF are being revised to ensure representatives have appropriate dosimetry to monitor possible radiological exposure. SCEMD will demonstrate revised procedures during the May 24, 2011 HBRSEP FEMA evaluated exercise.

**4.3.3 54-09-1.d.1-A-03  
Darlington County  
Lake Warning**

**Condition:** The Darlington County Emergency Operation Plan calls for the Sheriff's Office to provide 800 MHz radios to all law enforcement agencies that respond to assist in the event of an incident at the HBRSEP: (Annex 25 Appendix A; Section V. D.1.a ) (page 43). It also calls for

interoperable radio communications between law enforcement agencies. The Department of Natural Resources (DNR) officers had neither handheld or vehicle mounted radios capable of 800 MHz operation. The DNR officers are equipped with VHS radios that serve as their normal primary communications systems and each carry cellular telephones as secondary communications. Upon arrival at the EOC the officers failed to acquire 800 MHz radios and the handheld radios were not included in the kit that was prepared for their use.

**Possible Cause:** Neither the DNR nor the Darlington County Sheriffs Department have in place procedures that assure DNR obtain 800 MHz radios before deployment to their assignment for Lake Clearing.

**Reference:** NUREG-0654, F.1, 2.

**Effect:** The DNR officers had no direct contact with any other agency or with the County EOC without the use of a cellular telephone. There could be an unnecessary delay in relaying information from the field personnel to the EOC. Contact with the EOC necessitates the use of two separate dispatch offices.

**Recommendation:** The Darlington County Sheriff Department and DNR should develop a procedure that assures personnel assigned to Lake Warning are issued 800 MHz radios before they deploy to conduct Lake Warning.

**Schedule of Corrective Actions:** Procedures will be developed for DNR officers to assure officers assigned to Lake Warning are issued 800 MHz radios from Darlington County Sheriff Department prior to their deployment to conduct Lake Warning. DNR will demonstrate this

procedure during the May 24, 2011  
HBRSEP FEMA evaluated exercise.

#### **4.4 2009 ARCAs RESOLVED**

##### **4.4.1 54-09-3.a.1-A-02 Risk Jurisdictions Chesterfield County TCPs**

**Corrective Action Demonstrated:** The Emergency Management Director summoned the RO to provide a radiological briefing to the Deputy. After the RO's briefing, the Deputy displayed a sufficient knowledge of his equipment to properly read and record readings as instructed every fifteen minutes. He was aware that he was to call in to the EOC with any change in reading, was knowledgeable about KI and its purpose, and that he was subject to a limit of 1 R. He was familiar with protective measures and demonstrated an ability to limit his exposure sufficiently.

## APPENDIX 1

### 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
COBRA	Chemical Ordinance Biological Radiological
DHEC	Department of Health and Environmental Control
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DNR	Department of Natural Resources
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
ERC	Emergency Response Coordinator
FAA	Federal Aviation Agency
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Teams
FR	Federal Register
FRMAC	Federal Radiological Assessment Center
GE	General Emergency
HBRSEP	HB Robinson Steam Electric Plant

IRIS	Internet Routed Information System
JIC	Joint Information Center
KI	Potassium Iodide
MOC	Mobile Operations Center
MS-1	Medical Services Drill
NRC NUREG-0654	U.S. Nuclear Regulatory Commission NUREG-0654/FEMA-REP-1, Rev. 1, <i>"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980</i>
ORO	Offsite response organizations
PAD	Protective Action Decision
PAR	Protective Action Recommendation
PIO	Public Information Officer
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
RAP	Radiological Assistance Program
RCCC	Reception & Congregate Care Center
RDO	Radiological Defense Officer
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
RO	Radiological Officer
SAE	Site Area Emergency
SCHP	South Carolina Highway Patrol
SCMED	South Carolina Emergency Management Division
SEOC	State Emergency Operations Center
SMRAP	Southern Mutual Radiological Assistance Plan
TCP	Traffic Control Point
USDA	U.S. Department of Agriculture

## APPENDIX 2

### EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the HBRSEP exercise on May 19, 2009. The organization which each evaluator represents is indicated by the following abbreviations:

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

**Conrad S. Burnside**

**RAC Chairman**

**Lawrence A. Robertson**

**Section Chief/  
Central Tier**

#### EVALUATION SITE

#### EVALUATOR

#### ORGANIZATION

Lead Evaluator

Ronald D. Shaw

FEMA

#### **STATE OF SOUTH CAROLINA – Director: Charles R. Platt**

State Emergency Operations Center

Joseph Harworth  
Bruce Swiren  
Robert Nash

FEMA  
ICF  
FEMA

Dose Assessment

Brad McRee

ICF

DHEC MOC & Mobile Lab

Kevin Keyes

FEMA

Radiological Field Monitoring Team #1

Jill Leatherman

ICF

Radiological Field Monitoring Team #2

John Fox

ICF

Emergency Operations Facility

Larry Robertson

FEMA

JIC

Henry Christenson  
Onalee Grady-Erickson  
John Ackerman

ICF  
ICF  
FEMA

LP-1 Radio Station WJMX

Bill Vocke

ICF

State TCP

Nancy Johnson

ICF

**CHESTERFIELD COUNTY**

Emergency Operations Center	Michael Dolder Dick Wessman Alex Sera	FEMA ICF FEMA
Back-up Alert & Notification of the Public	Dick Wessman	ICF
Protective Actions for Schools	Dick Wessman	ICF
Traffic Control Points	Mark Dalton Robert Spence	ICF FEMA
Emergency Worker Decontamination	Glenn Kinnear	ICF
Reception and Congregate Care	Keith Earnshaw	ICF

**DARLINGTON COUNTY**

Emergency Operations Center	Odis Spencer Deborah Bell Ronald Shaw	FEMA ICF FEMA
Back-up Alert and Notification of the Public	Deborah Bell	ICF
Protective Actions for Schools	Deborah Bell	ICF
County Traffic Control Points	Nancy Johnson	ICF
Emergency Worker Decontamination	Mike Henry	ICF
Lake Warning	Mark Dalton Robert Spence	ICF FEMA
Medical Service Drill	Keith Earnshaw Glenn Kinnear	ICF ICF

**LEE COUNTY**

Emergency Operations Center	Gerald McLemore Bill Larrabee Lorenzo Lewis	FEMA ICF FEMA
Back-up Alert & Notification of the Public	Bill Larrabee	ICF
Traffic Control Points	Bill Larrabee	ICF
Reception & Congregate Care	Wendy Swygert	ICF

Emergency Worker Decontamination

Sonia Eischen

ICF

**FLORENCE COUNTY**

Reception Center & Congregate Care

Dan Prevo

ICF

Emergency Worker Decontamination

Roger Jobe

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 May 19, 2009 and were submitted with the extent-of-play agreement submitted by the State of South Carolina and approved by FEMA.

#### A. Exercise Criteria

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

#### B. Extent-of-Play Agreement

The extent-of-play agreement on the following pages was submitted by the State of South Carolina, and was approved by FEMA Atlanta Field Office in preparation for the HBRSEP exercise on May 19, 2009. The extent-of-play agreement includes any significant modification or change in the level of demonstration of each exercise criterion listed in Subsection A of this appendix.

#### EXTENT OF PLAY AGREEMENT

### 1. Emergency Operations Management

#### Sub-element 1.a, Mobilization

*Criterion 1.a.1: ORO's 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)*

**All state and local government personnel will not be pre-positioned unless specifically identified in this agreement. Activation of facilities should be completed in accordance with state and local plans and/ or procedures. These will be discussed in the applicable EOCs.**

#### Sub-element 1.c.1, 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, Darlington, and Lee County Emergency Operations Centers (EOC). Florence County EOC will be located in their mobile command vehicle at the Florence City/ County Civic Center. The DHEC Mobile Operations Center will be pre-positioned at the South Carolina Army National Guard Armory 1764 Harry Byrd Hwy, Darlington, SC. The State Emergency Response Team (SERT) participants include the Emergency Management Division (EMD); ESF 5, Information and Planning, ESF 6; Mass Care (Department of Social Services); ESF 8, Health and Medical Services (Department of Health and Environmental Control); ESF 10, Hazardous Materials (Department of Health and Environmental Control); and ESF 16, Emergency Traffic Management (Department of Public Safety and Department of Natural Resource). DHEC ESF-10 will provide one technical liaison per county, DHEC will coordinate with the County EMD Director to determine where the technical liaisons should be deployed. A simulation cell will represent the Office of the Governor, Office of the Adjutant General, FEMA Region IV, North Carolina, Georgia, and non-playing South Carolina state agencies. All simulated telephone calls will be made by calling the simulation cell.**

#### Sub element 1.d, Communications

*Criterion 1.d.1: At least two communications systems are available, at least one operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations. (NUREG-0654, F. 2.)*

**The Decision Line is the primary means of communication to notify off-site response forces. Backup to the Decision Line are commercial telephone lines, 800 MHz and the Local Government Radio (LGR).**

#### Sub-element 1.e, Equipment and Supplies to Support Operations

*Criterion 1.e.1: Equipment, maps, displays, dosimeters, potassium iodide (KI), other supplies are sufficient to support emergency operations. (NUREG-0654, H., J.10.a.b.e.f.j.k, 11, K.3.a).*

**Potassium Iodide for emergency workers will be simulated by candy or other means (empty envelope marked KI). A supply of KI for emergency workers is stored at the local EOC and/or Region 4 Health Departments and at DHEC Central Pharmacy in Columbia, S.C.**

**Quantities of KI for emergency workers, institutionalized individuals, and public will be confirmed at the local EOC and SEOC by documentation of the current inventory.**

**All state/county radiation detection equipment will be inspected, inventoried, and operationally checked before each use. State/county radiation detection equipment will be calibrated or leak tested in accordance with existing plans by the South Carolina Emergency Management Division Radiological Lab or authorized laboratory.**

**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.**

1. 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 in accordance with State Health plans. Emergency workers may voluntarily exceed dose limits only after being fully informed by DHEC or the local county Health Department of the biological effects of radiation and possible consequences of excessive exposures.**

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 including: 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, and Supplement 3.)*

**Dose assessment will take place at the South Carolina State Emergency Operations Center. This will be demonstrated in accordance with State Health plans and procedures. Protective Action Recommendations (PARs) by DHEC will be based on an evaluation of information received from the licensee independent dose assessments and simulated field monitoring data input.**

*Criterion 2.b.2: A decision-making process involved 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, J.9, 10.M.)*

**The Governor, or his designee, will demonstrate the ability to make appropriate Protective Action Decisions (PADs) based on recommendations from SCEMD, DHEC, and the risk counties (Darlington, Chesterfield, and Lee). PADs that require sheltering or evacuation of residents and/or transients in the 10-mile EPZ will be coordinated with the Chief County elected official or designee. This will be demonstrated in accordance with State Health plans and procedures.**

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

*Criterion 2.c.1: Protective action decisions are made, as appropriate, for special population groups. (NUREG-0654, J.9, 10.c.d.e.g).*

**There are a variety of Special Population groups within HBRSEP's 10-mile EPZ including one hospital, one college, nine public and ten private schools, two total care nursing homes and two institutions categorized as assisted care facilities. Darlington and Lee County representatives will be prepared to discuss their plans and procedures to satisfy this criterion at their respective EOCs. A list of potential special population citizens will be provided to the FEMA evaluators.**

2. Protective Action Implementation.

Sub-element 3.a. Implementation of Emergency Worker Exposure Control.

*Criterion 3.a.1: The OROs issue appropriate dosimeters and procedures, and manage radiological exposure to emergency workers in accordance with the plans and procedures. Emergency workers periodically and at the end of each*

*mission read their dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3).*

**Emergency workers or emergency worker teams will use Self Reading Dosimeters (SRDs) and simulated Permanent Record Dosimeters (PRDs) to monitor and control radiation exposure. Emergency workers in low exposure rate areas will use PRDs and may use direct reading dosimeters or place them in centralized areas.**

**Dosimeters are distributed through county emergency operations centers. Each county has an adequate inventory to support first-shift personnel. Supplemental dosimeters will be provided in accordance with the South Carolina Dosimeter Redistribution Standard Operating Procedures, after discussion and consideration at the SEOC. Supplemental SRDs will not be transported for the exercise. ESF-10 Department of Health and Environmental Control and the South Carolina Highway Patrol maintain and distribute their own SRDs.**

**Emergency workers will be interviewed to determine their knowledge of radiation exposure limits.**

#### Sub-element 3.b. Implementation of KI Decision

*Criterion 3.b.1: KI and appropriate instructions are available should a decision to recommend use of KI be made. Appropriate record keeping of the administration of KI for emergency workers and institutionalized individuals (not general public) is maintained. (NUREG-0654, E.7., J., 10.e.f.).*

**KI is distributed to emergency workers prior to their being dispatched, per county EOPs. Emergency workers will not ingest KI until ordered to do so by the State Health Officer or designee. If ordered, KI ingestion will be simulated. Record keeping will be discussed at Chesterfield, Darlington and Lee County EOCs.**

**The procedures for post-event distribution of KI to the public will be discussion at the SEOC, county EOC's and Florence Civic Center.**

#### Sub-element 3.c. Implementation of Protective Actions for Special Populations

*Criterion 3.c.1: Protective action decisions are implemented for special populations other than schools within areas subject to protective actions (NUREG-0654, E.7., J.9., 10.c.d.e.g.)*

**Chesterfield, Darlington, and Lee Counties will discuss the ability and resources to implement appropriate protective actions for special population needs. A list of people/facilities with special transportation needs will be provided to evaluators. Evacuation assistance will not be demonstrated.**

*Criterion 3.c.2: OROs/School officials decide upon and implement protective actions for schools. (NUREG-0654, J.10., d., g.)*

**Chesterfield County will simulate school evacuation by interviews with key school staff members.**

**McBee High School**

**McBee Elementary**

**Plain View Elementary**

**To be evaluated at the Chesterfield County EOC on May 19<sup>th</sup> 2009 at 10:00 A.M.**

**Darlington County will simulate school evacuation by interviews with key school staff members.**

**West Hartsville**

**Carolina Elementary**

**Emmanuel**

**Governor's School**

**To be evaluated at the Darlington County EOC on May 19<sup>th</sup> 2009 at 10:00 A.M.**

Sub-element 3.d. Implementation of Traffic and Access Control

*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 (TACPs) are predetermined. The South Carolina Highway Patrol, Darlington and Chesterfield Counties will demonstrate TACPs via discussion on-scene. The Counties will provide escorts for the evaluators at the County EOCs and transport them to and from each of the TACPs to be evaluated. Lee County will demonstrate TACPs via discussion at the county EOC.**

**State TACP:**

**TACP 16A: West Bobo Newsome and West Old Camden Road by the South Carolina Highway Patrol at 9:00 A.M. on May 19<sup>th</sup> 2009.**

**Chesterfield County:**

**US 1 & SC 102 by Chesterfield County Deputy Sheriff at 10:45 A.M. on May 19<sup>th</sup> 2009.**

**Darlington County:**

**TACP 16C: West Bobo Newsome and West Carolina Ave by the Hartsville Police Department at 9:45 A.M. on May 19<sup>th</sup> 2009.**

**TACP 16G: Harry Byrd and North Governor Williams Hwy by the Darlington Police Department at 10:45 A.M. on May 19<sup>th</sup> 2009.**

**Lee County:**

**TACP 31B US 15 and SR 341 by Deputy Sheriff at the Lee County EOC 10:30 A.M. on May 19<sup>th</sup> 2009.**

*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 by discussion with the Highway Patrol supervisor at the Darlington and Lee**

**Counties EOC. Chesterfield County Deputy Sheriff will be by discussion on scene.**

5. Field Measurement and Analysis

Sub-Element 4.a Plume Phase Field Measurements and Analyses

*Criterion 4.a.1: The field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates. (NUREG-0654, H.10; I.7, 8, 9)*

DHEC will conduct a full mobilization of two field teams, the mobile radiological laboratory and the Mobile Operations Center (MOC). The mobile lab will be participating in the exercise for training purposes only and is requesting a courtesy evaluation. All DHEC field equipment will be pre-positioned. The MOC, Mobile Lab and field team members will deploy from the South Carolina Army National Guard Armory 1764 Harry Byrd Hwy, Darlington, SC. The MOC will establish operations to demonstrate control of field operations within the 10-mile EPZ.

Silver Zeolite filters will be simulated with charcoal “marked” filters.

*Criterion 4.a.2: Field teams are managed to obtain sufficient information to help characterize the release and to control radiation exposure. (NUREG-0654, H.12; I.8,11; J.10.a)*

Direction and control of the two DHEC Field Teams will take place at the DHEC Mobile Operations Center (MOC) located at the South Carolina Army National Guard Armory 1764 Harry Byrd Hwy, Darlington, SC.

*Criterion 4.a.3: Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media. (NUREG-0654, I.9)*

For all air samples collected, the chain of custody will be discussed; however, the samples will not be transported to the DHEC headquarters located at 2600 Bull Street, Columbia, SC.

6. 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 FEMA REP guidance. (10 CFR Part 50, Appendix E & NUREG-0654, E.1., 4., 5., 6., 7.)*

**The State will coordinate Protective Action Decisions (PADs) with Chesterfield, Darlington and Lee Counties' Chief elected officials or designees. At the appropriate decision point sirens will be simulated and the Emergency Alert system (EAS) will be activated. A "Test Message" EAS message will be transmitted to the Local Primary (LP-1) EAS station (WJMX Florence S.C.). Copies of the simulated EAS message and news release will be provided to the FEMA evaluator at the SEOC. The sounding of the sirens will be simulated along with the EAS messages.**

*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 HBR SEP of a failure of the primary alert and notification system. (NUREG-0654, E.6, Appendix 3.B.2.c)*

**In the event of siren failure, Chesterfield, Darlington and Lee Counties will describe the back-up alerting system, by displaying maps of routes and day/night rosters.**

**Lake Clearing will be by discussion by the Department of Natural Resources at Lake Robinson in Darlington County. A DNR representative will meet the evaluator on May 19<sup>th</sup> at 0900 hrs. Darlington County will transport the evaluator to Easterling Landing and return him/her to Darlington EOC at the completion of the lake clearing evaluation.**

**Lake Clearing (Lake Robinson)**

**DPBL1 Easterling Landing, Darlington County**

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. (NUREG-0654, E.5, 7, G.3.a, G.4, a., b., c.)*

**The State, Chesterfield, Darlington, and Lee counties 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, Chesterfield, Darlington and Lee counties will be demonstrated at the JIC and appropriate county EOCs. Rumor control personnel will provide the FEMA Evaluator a rumor calls log.**

## 6. Support Operations/Facilities

Sub-element 6.a. Monitoring and Decontamination of Evacuees and Emergency Workers and Registration of Evacuees.

*Criterion 6.a.1: The reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h: K.5.b.)*

**At least six people will be monitored and registered. Personnel decontamination will be demonstrated via walk-thru and discussion. Water will not be used on personnel for decontamination in the exercise. All necessary supplies will be on-hand. Walkways will be covered with barrier material (simulated). Demonstration will include the necessary portable portal monitors and monitoring teams required to monitor 20% of the population allocated to the facility within 12 hours. At least two vehicles will be monitored and one vehicle decontaminated in accordance with local SOPs. Water will be used to demonstrate vehicle decontamination procedures.**

**The General Population Decontamination Points being evaluated on May 19, 2009 are:**

**Chesterfield County at 9:30 AM  
Chesterfield Senior High School**

**Florence County at 9:30 AM**  
**Florence City/County Civic Center**

**Lee County at 9:30 AM**  
**Lee Central High School**

Sub-element 6.b, Monitoring and Decontamination of Emergency Worker Equipment.

*Criterion 6.b.1: The facility/ORO has adequate procedures and resources for the accomplishment of monitoring and decontamination of emergency worker equipment including vehicles (NUREG-0654, K.5.b)*

**All necessary supplies will be displayed in accordance with local SOPs. Walkways will be covered with barrier material (simulated). Two emergency workers will be monitored via walk-thru and discussion. One emergency worker will be monitored and decontaminated (simulated) in accordance with local SOPs. Chesterfield County and Darlington County will demonstrate both emergency worker and equipment decontamination. Lee County and Florence County will only demonstrate emergency worker decontamination. There will be no emergency vehicle decontamination evaluated. Water will not be used on personnel for decontamination in the exercise.**

**Emergency Worker Equipment Decontamination Points will be evaluated on May 19, 2009**

**Chesterfield County at 10:00 AM**  
**Chesterfield Senior High School**

**Darlington County at 9:00AM**  
**Fire District Headquarters-Swift Creek Sta.2**

**Florence County at 10:00AM**  
**Florence City/County Civic Center**

**Lee County at 10:00 AM**  
**Bishopville Fire Station #1**

Sub-element 6.c, Temporary Care of Evacuees

*Criterion 6.c.1: Managers of congregate care facilities demonstrate that the centers have the resources to provide services and accommodations consistent with American Red Cross planning guidelines (found in MASS CARE Preparedness Operations, ARC 3031). Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate prior to entering congregate care facilities. (NUREG-0654, J.10.h.,12.).*

**Procedures that assure that only non-contaminated persons enter shelters will be demonstrated. All necessary supplies will be displayed in accordance with local SOPs. Walkways will be covered with barrier material (simulated). Six personnel will be monitored and registered in accordance with local SOPs. Two vehicles will be monitored and decontaminated (simulated) in accordance with local SOPs.**

**Congregate Care Facilities to be evaluated on May 19, 2009:**

**Chesterfield County at 10:00 AM**  
**Chesterfield Senior High School**

**Florence County at 10:30AM**  
**Florence City/County Civic Center**

**Lee County at 9:30AM**  
**Lee Central High School**

Sub-element 6.d, Transportation and Treatment of Contaminated Injured Individuals.

*Criterion 6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination and medical services to contaminated injured individuals.*

**Facility to be evaluated:**

**Darlington County:**

**Carolina Pines RMC, 20 May 2009 at 8:30 AM.**

## **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 May 19, 2009.

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

#### **2.0 Scenario**

##### **2.1 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, middle of core life (MOL). No equipment is out of service and no major maintenance fragnets are in the schedule.

A line of thunderstorms developed ahead of the cold front from the Ohio Valley to the Gulf Coast early Monday May 18, 2009. These storms are expected to move east in the late PM on Monday and overnight. As the storms continue to move east, they are expected to strengthen along a trough of low pressure that extends from the Piedmont sections of North Carolina into north central South Carolina. The storms moved into the eastern sections of the Carolinas during the early morning and continued to produce severe weather in the form of large hail, damaging winds, and isolated tornados. After the front passes through SC, the forecast is expected to be clear skies with day time temperatures in the lower eighties, night time temperatures in the lower fifties, and lite winds.

## 2.2 Timeline Summary and Tracking

EVENT	Scheduled Time	Actual Time	Time EAL IC Exceeded	Description	Classification (Record Time)/ Accurate (y/n)	Notification (Record Time)/ Accurate (y/n)	Protective Action Recommendations (Record Time)/ Accurate (y/n)
	0630			Controller Evaluator Final Meeting			
	0700			Simulator TAP-411 Completion			
	0700			Simulator Control Room Staff Briefing			
	0730			Main Control Room Staff Briefings			
	~0800			Ops Simulator Crew Takes the Watch			
1	~0805			Offsite Hazard (UE)			
2	~0850			Lightning Strike U2 DFOST (ALERT)			
3	~0915			Circ Water Pump Dis. Vlv Sump			
4	~1000			High Vibrations on "A" RCP			
5	~1002			LPMS Alarms			
6	~1002			Failed Fuel			
7	~1010			HVS-1 Trip			
8	~1015			Met Data Failure			
9	~1030			Steam Generator Tube Rupture (SAE)			
10	~1040			FT-493 SI Flow Transmitter Failure			
11	~1115			RWST Leak			
12	~1200			"C" S/G Safety Vlv Fails Open (GE)			
	~1330			Exercise Termination			



**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## **Exercise Start**

**~0800 Event Narrative:** The Operations Simulator Crew assumes the watch taking control of the simulated plant.

### **[Message Card – Severe Weather Warnings and Tornado Watches](#)**

**Delivery Time:** ~0800

**Delivery By:** Simulator Booth

**Delivery To:** Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

**“The National Weather Service has issued a Severe Thunderstorm Warning and a Tornado Watch for the following counties in South Carolina: Chesterfield, Darlington, Kershaw, and Lee until 10:45 AM. Large rain amounts, frequent cloud to ground lightning, high winds, and hail are expected.”**

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## EVENT 1 – Offsite Hazard (page 1 of 4)

**~0805 Event Narrative:** The Control Room receives a notice from Darlington County Emergency Management (DARCO EMD) that a tanker accident on Lake View Blvd, with bulk quantities of Chlorine, is releasing potentially toxic fumes. Although it is raining, the wind direction is towards the site, they are recommending that site personnel be sheltered indoors.

[Conditions will be met for the declaration of an **Unusual Event** initiating condition being exceeded due to ALL Conditions EAL Matrix HU3.2, "Recommendation by local, county, or state officials to evacuate or shelter site personnel based on off-site event".]

[**~0805 - 0820 Unusual Event** must be declared no later than this time (within 15 minutes of exceeding the EAL entry conditions)]

[**~0820 - 0835 UE** Notifications to the State and County Emergency Management Divisions must be completed during this time (within 15 minutes of the declaration)]

### Message Card – Offsite Hazard Notification

**Delivery Time:** ~0805

**Delivery By:** Simulator Booth (DARCO Control Cell)

**Delivery To:** Simulator Ops Crew

**Special Instructions:** Remember to use "THIS IS A DRILL MESSAGE" before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**"This is a drill message... This is \_\_\_\_\_ with Darlington County Emergency Management... We have had tanker accident on Lakeview Blvd resulting in a Chlorine gas release. The Robinson Plant is downwind of the accident; we recommend sheltering all your personnel indoors. The plume may reach your site in approximately 10-15 minutes.**

**Chlorine is a toxic gas and can cause breathing problems, skin and eye irritation, or death. The rain will wash most of the gases out of the air, but sheltering precautions need to be taken. If you have any questions you can contact me at (843) 307-0472. This is a drill message."**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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EVENT 1 – Offsite Hazard (page 2 of 4)

[Message Card – Offsite Hazard Announcement](#)

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... Attention all personnel, attention all personnel. All personnel are to **SIMULATE** taking shelter indoors immediately due to an offsite hazard. A tanker carrying Chlorine has crashed northeast of the site, which places the site downwind of the accident. Take shelter indoors immediately and report any smell of chlorine or medical emergencies to the Simulator Control Room. Procedure EPSPA-01 can be used to **SIMULATE** securing ventilation, if needed.”**

Repeat – **“SIMULATE** taking shelter indoors immediately and report any smell of chlorine or medical emergencies to the control room. Procedure EPSPA-01 can be used to **SIMULATE** securing ventilation, if needed. This is a drill message.”

**HBRSEP – Emergency Response Organization Exercise Scenario Package  
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EVENT 1 – Offsite Hazard (page 3 of 4)

**Message Card – [Unusual Event Declaration Announcement](#)**

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

Place VLC switch to the EMERGENCY position

**“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ an Unusual Event has been declared. The cause of the emergency is: recommendation by local officials to shelter personnel due to an offsite hazard. Use of the Public Address System is restricted to emergency or exercise communications only. No facility activation is required.”**

Repeat – **“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ an Unusual Event has been declared. The cause of the emergency is: recommendation by local officials to shelter personnel due to an offsite hazard. Use of the Public Address System is restricted to emergency or exercise communications only. No facility activation is required. This is a drill message.”**

Return the VLC switch to NORMAL position

**HBRSEP – Emergency Response Organization Exercise Scenario Package  
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## EVENT 1 – Offsite Hazard (page 4 of 4)

**~0835** Notification will be received from DARCO EMD that the accident release is under control and there is no longer a threat to the site.

### Message Card – Offsite Hazard Cleared

**Delivery Time:** ~0835 (at the direction of the Exercise Coordinator)

**Delivery By:** Simulator Booth (DARCO Control Cell)

**Delivery To:** Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

**“This is a drill message... This is \_\_\_\_\_ with Darlington County Emergency Management... The Chlorine accident is under control and there is no longer a threat to the Robinson Plant. If you have any questions you can contact me at (843) 307-0472. This is a drill message.”**

### Message Card – Offsite Hazard Cleared Announcement

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

**“This is a drill message... Attention all personnel. There is no longer an offsite hazard threat. Personnel are free to move about the plant.”**

Repeat – **“Attention all personnel. There is no longer an offsite hazard threat. Personnel are free to move about the plant. This is a drill message.”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 2 – Lightning Strike to DFOST (page 1 of 7)

**~0850 Event Narrative:** A lightning strike to the Diesel Fuel Oil Storage Tank (DFOST) ignites a fire requiring a **Fire Brigade response**.

[Security will need to consider evacuating the BRE near the DFOST, due to the wind direction.]

[Conditions will be met for an **Alert** initiating condition being exceeded due to ALL Conditions EAL Matrix HA2.1, “Fire, explosion, or steam line break (non-hostile) in any Table H-1 area...”.]

[**~0850 - 0905 ALERT** must be declared no later than this time (within 15 minutes of exceeding the EAL entry conditions)]

[**~0905 - 0920 ALERT** Notifications to the State and County Emergency Management Divisions must be completed during this time (within 15 minutes of the declaration)]

[If Operations does not rack-out the breaker for “B” Fuel Oil Pump, then ~30 min after the “B” EDG starts water will be transferred to the “B” Day Tank and subsequently to the “B” EDG, failing the EDG.]

### Message Card – Thunder Burst

**Delivery Time:** ~0850

**Delivery By:** All Controllers

**Delivery To:** All Participants in the area

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... You just heard a loud burst of thunder”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 2 – Lightning Strike to DFOST (page 2 of 7)

### [Message Card – Lightning Strike](#)

**Delivery Time:** ~0850 (at the direction of the Exercise Coordinator)

**Delivery By:** Security Officer Control Cell (BRE next to DFOST)

**Delivery To:** Security Shift Supervisor and Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

**“This is a drill message... I saw a bright flash and heard an immediate burst of thunder. When I turned around, I saw damage to the fuel oil storage tank and smoke rising into the air. The tank is on fire. This is a drill message.”**

### [Message Card – Fire Brigade Response Announcement](#)

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

Place VLC Switch in the EMREGENCY position

**“This is a drill message... Sound the fire alarm for 15 seconds and announce “Attention Fire Brigade personnel. Attention Fire Brigade personnel. A fire has been reported at the Unit 2 Diesel Fuel Oil Storage Tank; First Responders report the Fire Brigade Incident Commander. Non-fire brigade personnel stay clear of the fire area.”**

Sound the fire alarm for 15 seconds and announce **“Attention Fire Brigade personnel. Attention Fire Brigade personnel. A fire has been reported at the Unit 2 Diesel Fuel Oil Storage Tank; First Responders report the Fire Brigade Incident Commander. Non-fire brigade personnel stay clear of the fire area. This is a drill message.”**

[\[If an AO is sent to MCC-5 to check the breaker on the Fuel Oil Transfer Pump “A”, it is tripped.\]](#)

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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EVENT 2 – Lightning Strike to DFOST (page 3 of 7)

[Message Card – Alert Declaration Announcement](#)

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

Place VLC switch to the EMERGENCY position

**“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ an Alert has been declared. The cause of the emergency is: Fire at the Unit 2 Diesel Fuel Oil Storage Tank. Use of the Public Address System is restricted to emergency or exercise communications only. All EOF, TSC, OSC, and JIC personnel report to the normal ERO Facilities.”**

Repeat – **“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ an Alert has been declared. The cause of the emergency is: Fire at the Unit 2 Diesel Fuel Oil Storage Tank. Use of the Public Address System is restricted to emergency or exercise communications only. All EOF, TSC, OSC, and JIC personnel report to the normal ERO Facilities. Use of the Public Address System is restricted to emergency or exercise communications only. This is a drill message.”**

Return the VLC switch to NORMAL position

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 2 – Lightning Strike to DFOST (page 4 of 7)

### Mission Card – Fire Brigade Response

**Disciplines:** Operations, Radiation Control, Environmental and Chemistry, Security

**Controlled By:** Operations Training Fire Brigade Instructor and two other Controllers

**Controller Instructions:** ***No operating plant equipment is to be manipulated.*** Firefighting equipment is to be set-up and its use is to be **SIMULATED**. **NO** water will be flown. Give data as it is earned. This scenario is written to support an ERO Graded Exercise. It will not count as an evaluated fire brigade drill.

**Special Parts/Tools Needed:** Firefighting equipment

**Drawings/References:** Fire Preplans

**Mission Narrative:** Fire has been reported on the Unit 2 Diesel Fuel Oil Storage Tank. Fire Brigade has been dispatched in accordance with AOP-041.

**Plant Location:** Unit 2 Diesel Fuel Oil Storage Tank Area

**Mock-up Location:** None

**Mock-up Description:** (see below)

- **Cues**

Digitally enhanced photographs and a rotating red light will be used to define the size and location of the fire. Diagrams or digitally enhanced photographs will be used to describe the smoke conditions. The rotating red light will continue to operate until the fire is extinguished.

If foam is used, each 5 gallon pail of concentrate will be assumed to last 90 seconds. As each foam container is depleted, an “EMPTY” sign will be attached to the container.

Verbal cues will be given as needed, when the appropriate request is made. If a request is made for assistance from the Off-Site Fire Dept., the response will be that they are fighting a large fire and will be delayed. If a request is made for call-back of off-duty fire brigade members, the response will be that no one is answering their phone.

- **Simulations**

The fire brigade will be allowed to **SIMULATE** charging fire hoses and extinguishers, and operating plant components. If requested, the use of the Outside AO or BOP to deenergize equipment may be **SIMULATED**. Starting of the MDFP may be **SIMULATED**. The use of SCBA will be **SIMULATED**. The mask will not be donned and the regulator will remain attached to the waist strap. Evaluations for use of all aspects of PPE are done in Fire Brigade training and evaluated fire drill.

- **Participant Instructions**

1. A rotating red light (s) and digital photographs will be used to identify the extent of fire involvement.
2. Any fire extinguishers or hose lines pulled will be simulated charged.
3. Do not actually open any containers of foam concentrate.
4. SCBA will be worn, however the mask does not need to be donned.
5. Remember to use the phrases “This is a drill message.” and “**SIMULATE**”.

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## EVENT 2 – Lightning Strike to DFOST (page 5 of 7)

- **Controllers** - 3 controllers are needed as follows
  1. At the fire scene, to operate the props
  2. At the Fire Equipment Building, then proceed to the fire scene
  3. At the Command Post
- **Controller Instructions**
  1. Ensure that Fire Brigade Members properly display their badges and dosimetry when leaving the Fire Equipment Building.
  2. Ensure that plant equipment is not accidentally bumped.
  3. Ensure the participants understand that operation of plant equipment shall be **SIMULATED**.
  4. Ensure that all Fire Protection, Safety, Security, and Health Physics requirements are met.

**As Found Indications:** The lightning strike has breached the DFOST approximately 2/3 up from the bottom, resulting in a fire inside the dike. No personnel have been injured.

**Expected Actions:** Respond to fire with proper PPE and equipment, **SIMULATE** extinguishment methods, and secure the area as per the firefighting training and procedures.

A fire of this size requires approximately 540 gallons of foam. This would require three containers of foam concentrate, applied over an approximately 4½ minute period. An alternate strategy may utilize approx. 240 gpm of water fog, requiring a combination of two or more fire hoses for approximately five minutes. The amount of spilled fuel oil would not present a dike overflow concern if a water-based attack is selected.

**Mission Results:** All firefighting efforts will be successful, as earned

### [Message Card – Offsite Fire Department Not Available](#)

**Delivery Time:** After offsite fire assistance is requested

**Delivery By:** Simulator Booth (DARCO Control Cell)

**Delivery To:** Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... The Darlington County Fire and Hartsville Fire Departments are not available to respond, due to the HazMat accident. We will request mutual aid from Alligator Fire District. It will take approximately 30 minutes to notify them and for them to respond to your site. This is a drill message.”**

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EVENT 2 – Lightning Strike to DFOST (page 6 of 7)

**Message Card – [Emergency Assembly Announcement](#)**

**Delivery Time:** If requested and after Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

Place VLC switch to the EMERGENCY position, announce

**“This is a drill message”... sound the Site Evacuation Alarm for 5 seconds, and announce... “Attention all personnel, attention all personnel, all non-essential personnel report to the south end of Building 110, near the lake immediately.”**

Repeat – **“This is a drill message”... sound the Site Evacuation Alarm for 5 seconds, and announce... “Attention all personnel, attention all personnel, all non-essential personnel report to the south end of Building 110, near the lake immediately. Use of the Public Address System is restricted to emergency or exercise communications only. This is a drill message.”**

Return the VLC switch to NORMAL position

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 2 – Lightning Strike to DFOST (page 7 of 7)

### Mission Card – “B” Fuel Oil Pump Breaker Rack-out

**Disciplines:** Operations

**Controlled By:** Ops Controller

**Controller Instructions:** ***No plant equipment is to be manipulated.*** AO should determine status of breaker on MCC-6(17D) for the ‘B’ Fuel Oil Transfer Pump. The AO should then rack-out the breaker. If Operations does not rack-out the breaker for “B” Fuel Oil Transfer Pump, then ~30 minutes after the “B” EDG starts water will be transferred to the “B” Day Tank and subsequently to the “B” EDG, failing the EDG. All travel and equipment set-up must be demonstrated on the layout diagrams. Provide data as earned.

**Special Parts/Tools Needed:** None

**Drawings/References:** None

**Mission Narrative:** A lightning strike to the Diesel Fuel Oil Storage Tank (DFOST) ignites a fire requiring a Fire Brigade response. The Fire Brigade will use water to combat the fire resulting in the intrusion of water into the DFOST. Operations personnel have been directed by the Control Room to rack-out the ‘B’ Fuel Oil Transfer Pump breaker to prevent the transfer of water to the ‘B’ Day Tank.

**Plant Location:** MCC-6

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Layout Diagrams, pictures, verbal cues, or discussion

**As Found Indications:** Breaker on MCC-6(17D) for ‘B’ Fuel Oil Transfer Pump is closed.

**Expected Actions:** AO are to demonstrate travel to the breaker on the layout diagrams provided in the Mission Mock-up Room, explain how they would rack-out the breaker and report completion to the Control Room.

**Mission Results:** Successful as earned

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### EVENT 3 – Circ Water Pump Discharge Vlv Sump High Lvl (page 1 of 2)

**~0915 Event Narrative:** Rain water will collect in the sump area and the sump pump will not start resulting in alarms on APP-008. (RNP OE)

[~1000 Operations will initiate a plant shutdown in accordance with GP-006. Shutdown rate should be 1% per minute.]

#### Message Card – Operator Inspection of Sump

**Delivery Time:** ~0925 (as earned after demonstrating travel to Intake)

**Delivery By:** AO Controller

**Delivery To:** Simulator AO

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

**“This is a drill message... There does not appear to be any structural concern. It appears to be a large amount of rainwater collecting in the sump. The sump pump is not running.**

**If the sump pump breaker (LP-035) is checked...The breaker is not tripped. This is a drill message.”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 3 – Circ Water Pump Discharge Vlv Sump High Lvl (page 2 of 2)

### Mission Card – Circ Water Sump High Level

**Disciplines:** I&C/Electrical, Operations, Mechanical

**Controlled By:** I&C/E, Ops, and Mechanical Controllers

**Controller Instructions:** ***No operating plant equipment is to be manipulated.***

**SIMULATED-** Provide mock-up pictures and data as earned. All travel and set-up must be demonstrated on the layout maps.

**I&C/E Controller Instructions** Inform I&C/E Tech that the GFR has a “tripped” indication.

**Ops Controller Instructions:** AO should determine status of the valve pit and sump pump.

**Mechanical Controller Instructions:** Verify Mechanical actions and provide data as earned.

**Parts/Tools Needed:** None

**Drawings/References:** CWD 817

**Mission Narrative:** Operations has requested I&C/E assistance due to Annunciator APP-008-B8 (Screen Hi delta P / Valve Pit Hi Level) being locked-in.

**Plant Location:** Unit 2 Intake Structure

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Pictures, data, layout diagrams, verbal cues, or discussion

**As Found Indications:** APP-008-B8 locked in. No screens are showing Hi Delta P. Valve pit has an elevated water level and the sump pump is not running. Breaker in LP-35 is not tripped. Ground Fault Receptacle in the valve pit is tripped and will not reset.

**Expected Actions:** Inspect the sump and report the findings. AO are to demonstrate travel to the intake on the layout diagrams provided in the Mission Mock-up Room, explain how they would determine valve pit and sump pump status and report completion to the Control Room. Mechanical should obtain an alternate sump pump and set it up to pump out the sump. Once this is complete repairs can be made.

**Mission Results:** All mission efforts will be successful, as earned

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 4 – High Vibrations on “A” RCP (page 1 of 1)

**~1000 Event Narrative:** Alarms will be received on APP-001-B5 due to increased vibrations on “A” Reactor Coolant Pump. **Vibrations will ramp in until reaching a low alarm setpoint and then will level-off.**

### Mission Card – High Vibrations on “A” RCP

**Disciplines:** Operations, Mechanical, Radiation Control

**Controlled By:** Ops, Mechanical, and Radiation Control Controllers

**Controller Instructions:** **SIMULATE** No action is expected, due to the subsequent fuel damage and no data that is not available in the Simulator Control Room will be available.

**Parts/Tools Needed:** N/A

**Drawings/References:** N/A

**Mission Narrative:** Operations has received and locked-in alarms on Annunciator Panel APP-001-B5. Vibrations are currently ~15.5 mils on the RCP motor vibration monitors.

**Plant Location:** CV

**Mock-up Location:** N/A

**Mock-up Description:** Pictures, data, layout diagrams, verbal cues, or discussion

**As Found Indications:** N/A

**Expected Actions:** N/A

**Mission Results:** N/A

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
**Limited Accessibility** - In order to maintain scenario integrity, the information contained in this package **shall only** be discussed with Scenario Development Team Members. **NOT** with persons participating in the exercise.

## EVENT 5 – LPMS Alarms (page 1 of 2)

**~1002 Event Narrative:** Alarms will be received on APP-36-I4.

### Mission Card – LPMS Alarms

**Disciplines:** Operations, Engineering

**Controlled By:** Ops Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated.*** Personnel are to travel to the actual monitor location and Controllers will provide earned data supporting the plant conditions. All actions are to be **SIMULATED** and discussed “out loud”.

**Special Parts/Tools Needed:** Key Ring #137

**Drawings/References:** OP-007

**Mission Narrative:** The site has experienced high vibrations on ‘A’ RCP and a LPMS alarm is received (APP-036-I4). Operations and Engineering personnel have been requested to check the LPMS cabinet for alarms and to retrieve recorded data.

**Plant Location:** Rod Drive Control Room

**Mock-up Location:** None

**Mock-up Description:** Photos, data, and discussion

**As Found Indications:** LPMS display indicated alarms on channel 752, Lower Reactor Vessel. (See attached)

**Expected Actions:** Report **SIMULATED** as found conditions and discuss actions taken.

**Mission Results:** All actions will be successful and the data provided, if earned.

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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EVENT 5 – LPMS Alarms (page 2 of 2)

Printer Read outs:

<b>LCN:</b>	<b>LRV</b>	<b>MAX AMPL: 8.3</b>	<b>Date: May 19 09</b>
<b>Ch #</b>	<b>752</b>	<b>AVE AMPL: 4.2</b>	<b>Time: 10:45:16</b>
<b>SETP:</b>	<b>2.0</b>	<b>MAX RATE: 9</b>	<b>M EVENT TIMES</b>
<b># &gt;SP:</b>	<b>19</b>	<b>AVE RATE: 4</b>	<b>FIRST: 10:02:03</b>
<b># &lt;SP:</b>	<b>40</b>	<b>EV: ELSWR: 1</b>	<b>LAST: 10:37:42</b>

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 6 – Failed Fuel (page 1 of 1)

**~1002 Event Narrative:** Letdown Radiation Monitor, R-9 will start rapidly increasing and reach ~30,000 mRem/hr in ~8 minutes.

[Additional conditions will be met for an **Alert** initiating condition being exceeded due to HOT Conditions EAL Matrix FA1.1, “Any loss or potential loss of either Fuel Clad or RCS, Fuel Clad Barrier Loss #4”.(NO Initial ENF required, follow-up is at the discretion of the ERM) AND RA2.4 “Valid dose rates >2000 mRem/hr in Table R-2 Areas requiring infrequent access to maintain plant safety functions”]

### Mission Card – Failed Fuel Primary System Sampling

**Disciplines:** Environmental & Chemistry, Radiation Control

**Controlled By:** E&C and RC Controllers

**Controller Instructions:** ***NO plant equipment is to be manipulated.*** Provide rad data and analysis data, as earned. All travel and equipment set-up must be demonstrated on the layout diagrams. Notify the Simulator Booth when sampling is in progress so Primary Sample Room Radiation Monitor, R-6, can be brought on scale.

**Special Parts/Tools Needed:** PPE, sample equipment, procedure

**Drawings/References:** CP-003

**Mission Narrative:** An increase in rad conditions on R-9, RCS Letdown Monitor indicates there is fuel failure. E&C has been requested to sample the RCS.

**Plant Location:** Primary Sample Room/PASS

**Mock-up Location:** None

**Mock-up Description:** Walk-down and **SIMULATE** the operation of sample valves.

**As Found Indications:** Increased rad levels in operating RCS systems.

**Expected Actions:** The E&C Tech will check the reading on R-6 prior to sampling and check radiation levels in the room as sample is purging. The E&C Tech will sample, analyze, and report the RCS data.

**Mission Results:** **SIMULATED** RCS sample collected. Rad data provided as earned. Analytical data to be provided with an approx 15 min delay from returning to the lab.

**HBRSEP – Emergency Response Organization Exercise Scenario Package  
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## EVENT 7 – HVS-1 Trip (page 1 of 2)

**~1010 Event Narrative:** HVS-1 breaker on MCC-5, CMPT 7J, will trip due to breaker failure.

[~1010 Operations will initiate a rapid plant shutdown in accordance with GP-006. Shutdown rate is 3% per minute.]

### Message Card – Breaker Indications

**Delivery Time:** ~1015 (as earned)

**Delivery By:** AO Controller

**Delivery To:** Simulator AO sent to check breaker

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... The HVS-1 breaker is in the “trip free” condition. There is no acrid odor or indication of physical damage. This is a drill message.”**

If asked to reset the breaker, then reply... **“I tried to reset the HVS-1 breaker and it will not reset.”**

### Message Card – Response to Degraded Conditions

**Delivery Time:** ~1020

**Delivery By:** Simulator Floor Controller

**Delivery To:** Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... Plant Management does not want you to trip the plant, unless you cannot control the unit. You may proceed with a controlled rapid shutdown in accordance with GP-006. This is a drill message.”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 7 – HVS-1 Trip (page 2 of 2)

### Mission Card – HVS-1 Trip

**Disciplines:** Operations, I&C/E

**Controlled By:** Ops and I&C/E Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated.*** **SIMULATED**- Provide mock-up pictures and data, as earned. All travel and set-up must be demonstrated on the layout maps. Inform I&C Tech that the breaker for “B” MDAFW Pump has dual indication.

**Special Parts/Tools Needed:** None

**Drawings/References:** CWD 544

**Mission Narrative:** Operations notified I&C/E that HVS-1 breaker has tripped. Operations personnel have been requested to check the status of the breaker.

**Plant Location:** Aux 1 Hallway, MCC-5

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Pictures, data, layout diagrams, verbal cues, or discussion.

**As Found Indications:** HVS-1 breaker on MCC-5, CMPT 7J, tripped. Breaker will not reset – tripped due to breaker failure.

**Expected Actions:** All travel and set-up must be demonstrated on the layout maps.

Explanation as to how indications are read and what actions are taken must be reported to the Controller. Attempts to reset the breaker fail.

**Mission Results:** All actions will be successful as earned.

[~1020 vibrations on the “A” RCP are going to increase resulting in AOP-018 requiring a **manual plant trip**. Upon securing “A” RCP a safety Injection will result in the RCS Letdown System isolating; R-9 is no longer valid, until letdown is restored.]

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 8 – Met Data Failure (page 1 of 1)

**~1015 Event Narrative:** ERFIS indications for the Met Tower will fail. [ERFIS updates every 15 minutes, so loss may not be indicated until ~1030] [While ERFIS Met Data is out of service, earned forecast and met data may be provided from the “hbrmetcd” file attached to this scenario. Do NOT allow participants to call offsite agencies.]

### Mission Card – Met Data Failure

**Disciplines:** Operations, I&C/E, NIT

**Controlled By:** I&C/E and NIT Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated.*** Provide mock-up pictures and data as earned. All travel and set-up must be demonstrated on the layout maps.

**Special Parts/Tools Needed:** None

**Drawings/References:** None

**Mission Narrative:** Operations notified NIT and I&C/E that ERFIS indications for the Met Tower have failed.

**Plant Location:** MET Tower and ERFIS room

**Mock-up Location:** None

**Mock-up Description:** Actual walk downs, pictures, data, layout diagrams, verbal cues, or discussion.

**As Found Indications:** All ERFIS Met Data points are not updating. Troubleshooting on ERFIS will indicate that communications with the MET Tower has been lost and that the Met Data computer is operational.

**Expected Actions:** NIT will troubleshoot the communication failure and discover that the Serial to Fiber Converter on the Met Tower connection has failed. This device will be replaced and the ERFIS Met data will return to service.

**Mission Results:** All actions are successful as earned.

**HBRSEP – Emergency Response Organization Exercise Scenario Package  
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## EVENT 9 – Steam Generator Tube Rupture (page 1 of 2)

**~1030 Event Narrative:** A primary to secondary tube leak will start on “C” Steam Generator and progress to a tube rupture (~275 gpm).

[Conditions will be met for a **Site Area Emergency (SAE)** initiating condition being exceeded due to HOT Conditions EAL Matrix FS1.1, “Loss or potential loss of any two barriers, Fuel Clad Barrier Loss #4 and RCS Barrier Loss #3”.]

[~1030 - 1045 **SAE** must be declared no later than this time (within 15 minutes of exceeding the EAL entry conditions)]

[Releases are in progress via the Steam Driven AFW Pump warm-up line and through the Condenser to the Plant Stack (R-15, Condenser Vacuum Radiation Monitor and R-14 C, D, & E, Plant Stack Radiation Monitors)]

### Message Card – SAE Declaration Announcement

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

#### **Message:**

Place VLC switch to the EMERGENCY position, sound the Site Evacuation Alarm for 10 seconds, and announce...**“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ a Site Area Emergency has been declared. The cause of the emergency is: Loss or potential loss of two fission product barriers (Fuel Clad and RCS). All non-essential personnel report to the south end of Building 110, near the lake.”**

Repeat – **“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ a Site Area Emergency has been declared. The cause of the emergency is: Loss or potential loss of two fission product barriers (Fuel Clad and RCS). All non-essential personnel report to the south end of Building 110, near the lake. Use of the Public Address System is restricted to emergency or exercise communications only. This is a drill message.”**

Return the VLC switch to NORMAL position

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 9 – Steam Generator Tube Rupture (page 2 of 2)

### Mission Card – Primary to Secondary Leak

**Disciplines:** Environmental & Chemistry, Radiation Control

**Controlled By:** E&C and RC Controllers

**Controller Instructions:** *No plant equipment is to be manipulated.* **SIMULATED** - Provide, as earned, data supporting the plant conditions. All actions are to be **SIMULATED** and discussed. All travel and equipment set-up must be demonstrated on the layout diagrams.

**Special Parts/Tools Needed:** PPE, Sample equipment

**Drawings/References:** CP-003

**Mission Narrative:** Chemistry personnel have been requested to sample plant systems.

**Plant Location:** Primary Sample Room / Secondary Sample Room

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Pictures, layout diagrams, data, and discussion

**As Found Indications:** As provided

**Expected Actions:** Sample and analyze, as requested

**Mission Results:** Successful as earned

### Message Card – Weather Changes

**Delivery Time:** ~1040

**Delivery By:** All Controllers

**Delivery To:** Anyone that can see outside or is outside

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“The sky is clearing and the rain has stopped.”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 10 – FT-943 SI Flow Transmitter Failure (page 1 of 1)

**~1040 Event Narrative:** SI flow transmitter will fail low due to a power supply failure.

[~1045 - 1100 SAE Notifications to the State and County Emergency Management Divisions must be completed during this time (within 15 minutes of the declaration)]

[~1045 Met data repair is complete. ERFIS Met Data return may take ~5-15 minutes]

### Mission Card – FT-943 Failure

**Disciplines:** I&C/E

**Controlled By:** I&C/E Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated.*** **SIMULATED**- Provide mock-up pictures and data as earned. All travel and set-up must be demonstrated on the layout maps.

**Special Parts/Tools Needed:** Screw Driver and new power supply

**Drawings/References:** 5379-03508 (5957-D68)

**Mission Narrative:** Operations has requested assistance with ERFIS point SIF5304A. It is reading “BAD” and LI-943 is indicating less than “0”

**Plant Location:** Hagan Room

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Pictures, data, layout diagrams, verbal cues, or discussion.

**As Found Indications:** FI-943 is reading less than “0” and ERFIS Point SIF5304A are reading “BAD” – FQ-943 has no output and its’ output fuse is good – There is 120 VAC feeding FQ-943

**Mission Results:** Successful as earned

**Expected Actions:** All travel and set-up must be demonstrated on the layout maps.

[~1100 - 1145 Lunch will be provided]

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## EVENT 11 – RWST Leak (page 1 of 1)

**~ 1115 Event Narrative:** If the Control Room does not recognize the RWST decreasing trend, then Security will report a leak on the RWST. The leak is on the PWST side of the tank and once evaluated will be ~50 – 60 gpm.

### Message Card – RWST Leak

**Delivery Time:** ~1115

**Delivery By:** Security Officer Control Cell

**Delivery To:** Security Shift Supervisor and Simulator Ops Crew

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... There is a good bit of water streaming from under the insulation on the RWST, next to the PWST. This is a drill message.”**

### Mission Card – RWST Leak

**Disciplines:** Operations, Radiation Control, Mechanical, Environmental and Chemistry

**Controlled By:** Ops, RC, Mechanical, and E&C Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated. SIMULATED*** - Provide, as earned, data supporting the plant conditions. All actions are to be **SIMULATED** and discussed. All travel and equipment set-up must be demonstrated on the layout diagrams.

**Special Parts/Tools Needed:** Temporary patch materials

**Drawings/References:** None

**Mission Narrative:** A leak was reported on the RWST near the PWST. Operations, RC, E&C, and Mechanical personnel have been requested for assistance and repairs.

**Plant Location:** RWST/PWST Tank Area

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Layout Diagrams, verbal cues, data, and discussion

**As Found Indications:** Water is streaming from under the RWST insulation onto the ground and into the storm drain.

**Expected Actions:** Report as found conditions and discuss actions taken. Remove the insulation and discover a seam leak, ½ inch wide and 6 inches long. The leak rate should be determined to be approx 50 gpm. Attempts to slow the leakage are to be made and permanent repairs will require additional oversight and guidance.

**Mission Results:** Temporary patches will slow the leak to approx 1 gpm until permanent actions can be taken.

[If resources allow, AOP-008 may be entered.]

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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EVENT 11 – RWST Leak (page 1 of 1)

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
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## Event 12 – “C” Steam Generator Safety Fails Open (page 1 of 3)

**~1200 Event Narrative:** “C” Steam Generator Safety fails open.

[Conditions will be met for a **General Emergency (GE)** initiating condition being exceeded due to HOT Conditions EAL Matrix FG1.1, “Loss of any two barriers and loss or potential loss of third barrier, Fuel Clad Barrier Loss #4, RCS Barrier Loss #3, and Containment Loss #3 or 4”.]

[~1200 - 1215 **GE** must be declared no later than this time (within 15 minutes of exceeding the EAL entry conditions)]

[~1215 - 1230 **GE** Notifications to the State and County Emergency Management Divisions must be completed during this time (within 15 minutes of the declaration)]

### Message Card – Steam Releasing from Pipe Jungle

**Delivery Time:** ~1200

**Delivery By:** Any Controller supporting the OSC

**Delivery To:** Anyone in the OSC or in the Turbine Building

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... There is a large amount of steam coming from Pipe Jungle in the Turbine Building. It appears that a safety valve is open. This is a drill message.”**

**HBRSEP – Emergency Response Organization Exercise Scenario Package**  
**Limited Accessibility** - In order to maintain scenario integrity, the information contained in this package **shall only** be discussed with Scenario Development Team Members. **NOT** with persons participating in the exercise.

Event 12 – “C” Steam Generator Safety Fails Open (page 2 of 3)

[Mission Card – “C” Safety Failed Open](#)

**Disciplines:** Operations, Radiation Control, Mechanical, Environmental and Chemistry

**Controlled By:** Ops, RC, Mechanical, and E&C Controllers

**Controller Instructions:** ***No plant equipment is to be manipulated. SIMULATED*** - Provide, as earned, data supporting the plant conditions. All actions are to be **SIMULATED** and discussed. All travel and equipment set-up must be demonstrated on the layout diagrams. Hose station hand wheel is missing. If this is repaired, then the hose line coupling threads are damaged and are leaking too much to get a good wash-down of the plume.

**Special Parts/Tools Needed:** None

**Drawings/References:** None

**Mission Narrative:** “C” S/G Safety has failed open

**Plant Location:** Turbine Building – Turbine Deck

**Mock-up Location:** Mission Mock-up Room

**Mock-up Description:** Layout Diagrams, verbal cues, data, and discussion

**As Found Indications:** Steam is being released via the “C” S/G Safety

**Expected Actions:** Report as found conditions and discuss actions to be taken. OSC should recommend setting-up a set of fire lines to wash-down the plume of steam, to reduce the overall release of radioactive materials.

**Mission Results:** Attempts to slow the leakage are unsuccessful and additional mitigating actions will require additional oversight and guidance.

[FT-943 can be returned to service. SI Flow will be re-established]

[Steam flow from “C” Safety is ~0.2E+6 lbs mass/hr. RCS leakage into “C” S/G is ~260 gpm.]

**HBRSEP – Emergency Response Organization Exercise Scenario Package  
Limited Accessibility** - In order to maintain scenario integrity, the information contained in this package **shall only** be discussed with Scenario Development Team Members. **NOT** with persons participating in the exercise.

Event 12 – “C” Steam Generator Safety Fails Open (page 3 of 3)

**Message Card – [GE Declaration Announcement](#)**

**Delivery Time:** After Simulator Ops Crew makes the announcement

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

Place VLC switch to the EMERGENCY position and announce...

**“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ a General Emergency has been declared. The cause of the emergency is: Loss of two barriers and loss or potential loss of third barrier.”**

Repeat – **“This is a drill message... Attention all personnel, attention all personnel, at \_\_\_\_\_ a General Emergency has been declared. The cause of the emergency is: Loss of two barriers and loss or potential loss of third barrier. Use of the Public Address System is restricted to emergency or exercise communications only. This is a drill message.”**

Return the VLC switch to NORMAL position

**~1330 TERMINATION** [Review of all facility objectives to ensure that opportunity was given to complete the objectives and they have been met or have been noted as unable to be met.] Once objective review is completed by all facilities, then the EOF Lead Controller will issue the message card to the ERM to initiate the state and county exercise termination notification. Once the notification has been completed then all facilities can terminate and prepare for the critique.]

### **Message Card – Termination**

**Delivery Time:** ~1330 (at the direction of the Exercise Controller)

**Delivery By:** Simulator Booth

**Delivery To:** Main Control Room (Plant Announcement)

**Special Instructions:** Remember to use “THIS IS A DRILL MESSAGE” before delivering the message and after. Make sure you use THREE-WAY COMMUNICATIONS; the person receiving the call needs to clearly understand what message is being delivered. Once the message has been delivered then provide earned data from the mission card.

**Message:**

**“This is a drill message... The exercise is terminated. This is a drill message.”**

**~1345** Facility Critiques Begin

## APPENDIX 5

### MEDICAL SERVICES DRILL

#### **Darlington County Emergency Medical Services (EMS) and Carolina Pines Regional Medical Center (CPRMC)**

The H.B. Robinson Steam Electric Plant (HBRSEP) Medical Services (MS-1) Drill was initiated on May 20, 2009 at 0815 from the Darlington County EMS Hartsville Base, 411 South Fourth Street, Hartsville, South Carolina, 29550. Participating agencies were; Darlington County Emergency Medical Services (EMS), Darlington County Emergency Management, Carolina Pines Regional Medical Center (CPRMC), South Carolina Emergency Management, and HBRSEP.

The Darlington County EMS personnel utilized the following equipment:

- Ford F350 Type 1 Modular Ambulance (equipped with radio emergency lights and siren)
- 1 – Ferno gurney
- Personal protective equipment (PPE) (tape, booties, Tyvek coveralls, surgical masks)
- A box of latex gloves for each RRT team member
- Plastic bags and ties for contaminated items
- Radiological hazard tape
- Gurney sheets and blankets (6)
- Ludlum 3 survey meter with a 44-9 pancake probe
- 6- (0-5R) self-reading dosimeters
- 3 thermoluminescent devices
- Weights to hold down ground covers
- Saran wrap
- 1- CDV 750 dosimeter charger
- Mass casualty triage tags
- 1- Backboard wrapped in a sheet for ground cover
- EMS patient forms

Each EMS worker is equipped with a South Carolina Emergency Management Department (SCEMD) Radiological Emergency Worker Job Performance Aid which personnel referred to for information on Potassium Iodide (KI), operational instructions for the Ludlum 3, call back limits .1R, turn back limits 1R, protection of property 2R, and lifesaving 5R. Other information printed on the card included contamination action levels of 330 cpm, and when to report and record dosimeter readings. Dosimetry is delivered to the EMS station from the Darlington County EOC and return to the same location.

Each EMS worker was knowledgeable of the dosimetry limits and information found on the SCEMD card.

At 0815 the Darlington County EOC contacted the EMS base to advise them of a contaminated patient that is injured at Darlington County Station 12. The 3 ambulance attendants began dressing in PPE as indicated in appendix 6 of the Darlington County Plans. EMS workers dressed in booties, and wore multiple layers of gloves, their dosimetry was worn on the outside of their Tyvek coveralls, additionally all EMS workers wore eye protection. During this time period a call by the Darlington County Director was placed to the CPRMC that a Darlington County EMS ambulance was en-route to Darlington County Station 12 for a radiologically contaminated patient, reported to be injured.

At 0831, the Darlington County EMS unit was en-route to the injured person's location. Once en-route the ambulance driver requested all EMS workers read their dosimeters and report their readings so they could be recorded. The ambulance driver then notified CPRMC that they were en-route to the injured person's location by using the ambulance radio. Darlington County EMS's Ambulance arrived at Darlington County Fire Station at 0855.

EMS workers disembarked the ambulance and approached the patient and began a patient assessment of the victim and inquired of the victim what happened and how. The patient responded by giving details of the accident and prior medical history the patient has. Name, age, address, and patient history was recorded by EMS workers.

Having a 10-minute limit for EMS workers to evaluate and load the patient, the patient was quickly bandaged at the head and left arm and then wrapped in sheets to prevent any cross contamination. The patient was then placed on to a gurney which was placed back into the ambulance.

A second patient who accompanied the first patient refused medical attention and was directed to an evacuee decontamination center.

At 0910, the Darlington County EMS unit was en-route to the hospital, vitals were automatically taken by medical equipment and recorded (simulated), the driver again called out for the crew to report their dosimeter readings for recording purposes, all dosimeters showed "0". At 0925, an addition recording of dosimeter readings were recorded as "0".

At 0930, the Darlington County EMS unit arrived at CPRMC and carefully backed into a marked area specially prepared for their arrival, the patient was unload in the hot zone and a transfer of the patient to hospital staff began. The EMS crew stated that decontamination of the ambulance would be conducted at Darlington County Fire Station #2.

At 0840, CPRMC was notified by the Darlington County EMS that injured and potentially contaminated individuals from a traffic accident would be transported to the CPRMC for medical treatment and possible decontamination.

The CPRMC Radiological Response Team (RRT) immediately initiated the hospital's preparation of a Radiological Emergency Area (REA). The RRT consisted of the Emergency Department (ED) Director, one physician, two nurses, a recorder, a nuclear medicine technician, and two security personnel. Security personnel were initially posted at the REA boundary, but

the ED Director indicated that he would also post security at the hospital entrance in an actual emergency. The RRT was assisted by four HBRSEP Radiological Control Technicians (RCTs) and one supervisor for radiological support. Throughout the exercise, the RRT and RCTs used guidance from the Carolina Pines Regional Medical Center Emergency Operation Plan, Annex M, Nuclear Radiation Release, Concept of Operations, dated August 21, 2008.

The REA was established within 20 minutes and ready to receive the patient at 0900. The 20-minute set up time was within the procedural guidance stating that set up of the REA would require approximately 30 minutes. During preparation, all RRT and RCT members donned personal protective equipment (PPE), and RCTs checked and determined the background level to be 80 counts per minute (cpm). In accordance with the hospital procedure, two times background ( $2 \times 80 \text{ cpm} = 160 \text{ cpm}$ ) was used as the contamination level. Direct Reading Dosimeters (DRDs) were also checked and documented by the RCT recorder.

The ambulance arrived at the CPRMC Emergency/Trauma Department at 0930 and backed into the designated area demarcated with stanchions and red painted lines on the concrete to identify the boundary between potentially contaminated and non-contaminated areas. Rad tape was used between the stanchions to indicate the barrier line. The patient was removed from the ambulance at 0935 and remained on a gurney on the “hot” side of the receiving area. The patient was cocooned in sheets for contamination control. The ambulance team provided vitals and patient condition to the RRT physician, describing a three-inch scalp laceration on the left side of his head and a six-inch laceration on his left forearm. The patient was properly transferred onto the CPRMC gurney at which time the hospital assumed responsibility for the radiological and medical condition of the patient. The gurney was fitted with a decontamination table with double sheets on top for additional contamination control.

The cocoon surrounding the patient was rolled back and an RCT initiated monitoring of the patient. Contamination levels provided by the controller were 500 cpm (hair) and 2000 cpm (wound on the left arm). The RRT physician checked vitals and asked the patient if he was in pain, alert, and able to talk normally. The patient indicated a low pain level and stated that he was alert and his speech was normal.

At 0949, the patient was then transferred on the gurney into the Decontamination Shower room. This room has tiled walls and floor, with a floor drain in the center, a fixed shower head, and a hand-held shower head affixed to a flexible hose. Rad tape was on the floor down the center of the room to demarcate the “hot” line. Equipment and supplies such as swabs, gauze, wipes, plastic bags, and a Ludlum frisker were on the “cold” side of the line. Materials were transferred from an RCT on the cold side to RRT members on the hot side, as requested. A hose was extended from the gurney into a drain on the shower floor to collect water while minimizing the chance of water splashing on the floor.

Once the patient and gurney were secured in the shower area, gauze was removed from the patient’s head and left arm. These efforts were in preparation to decontaminate the patient using water spray (simulated) from the hand-held shower head. After the first decon effort, the patient was monitored and background levels were identified in all areas except for the injured head and left arm which were at 120 cpm and 2000 cpm, respectively. Wet “Ready Bath” wipes were then

sent in by the RCT and wiping of the patient's head and arm resulted in reduction of contamination levels to 60 cpm and 1000 cpm, respectively. Wet wipes and "Scrub Care" sponges were then used locally on the left arm for two more decon attempts and the subsequent monitoring indicated background levels. Finally, ear and nasal swabs were taken and transferred across the "hot" line and placed into plastic bags being held by an RCT. The swabs were then monitored for contamination and both were found to be at background levels. The RRT members routinely changed their outer gloves following each decon evolution.

At 1005, the patient was assisted to sit on the side of the decontamination table and a final monitoring was conducted to ensure the patient was free of contamination. The patient was moved onto the wheel chair and transported to the "cold" side. The wheel chair and patient were monitored at background levels. At this point, the patient was cleared to be taken into the ED for treatment.

Following release of the patient for treatment, an RRT nurse demonstrated doffing PPE with the assistance of an RCT. A doffing sequence was posted in a laminated 8.5 x 11 inch sheet on the wall adjacent to the step off pad, but due to glare and 12 font print on the sheet, the posting was difficult to read. The doffing sequence was successful and the RCT monitoring the RRT nurse used good monitoring technique and verified background levels.

With regard to equipment and supplies at the CPRMC ED, two rolling carts and one metal cabinet contained all of the supplies necessary to establish an REA.

The calibration due date on all DRDs (ten 0 – 200 mR DRDs and ten 0 – 20 R DRDs) was 07/31/09. The replacement date for the potassium iodide was July 2013. The replacement date for the TLDs was 08/17/09. The calibration due date was 02/11/10 for the Eberline micro-R meter, and 02/20/10 and 09/30/09 on the two Ludlum Model 177 Friskers.

This cabinet is inventoried and re-stocked by the HBRSEP RCTs, on a quarterly basis and a tamper seal is affixed after the inventory and re-stock is completed. The RCTs also performed the response and operability checks on the radiological instrumentation.

Other equipment included:

- a Stryker gurney and decontamination table (with a backboard, catch basin, drain, and drain tube)
- trash containers with plastic liners, labeled as "Radioactive Waste"
- stanchions (7)
- rolling carts (2) with decontamination materials: gauze, swipes, Ready Bath wipes, and "Scrub Care" sponges

Supplies were available in sufficient quantities to supply all members of an RRT and support personnel.

Regarding emergency worker contamination and exposure control, the RRT dressed out in two pairs of booties, Tyvek coveralls, inside gloves taped to the coveralls, outer gloves, skull cap, hood, and a face shield. A 0-200 mR DRD was attached to the outside of the gowns for easy

access. Dose record cards were completed for each RRT member by the RCT recorder. Two RRT members were quizzed on administrative limits, and correctly referred to the Radiation Exposure Record, which lists the Call Back Value of 0.1 R, the Turn Back Value of 1 R, Protecting Valuable Property at 2 R, and Life Saving as 5 R.

In conclusion, the EMS staff demonstrated exceptional teamwork and did an excellent job caring for the patient during the MS-1 drill. Excellent contamination and exposure control practices were observed throughout the demonstration, with medical care always taking priority.

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

**Recommendations:**

Darlington County Plans, Appendix 6, page 51, paragraph 6, indicates EMS workers entering a the 10-mile EPZ after a release should be instructed to ingest KI, this directive was not given during the exercise.

Injects were provided to inform EMS workers of the patient’s condition and level of contamination when they approached the patient at Darlington County Fire Station 12, this inject was not played out by the State Controller.

Although the Radiological Emergency Area (REA) setup was adequate, it is recommended that the schematic be enlarged and provide sufficient detail to fully describe REA setup. Details should include description of ropes, stanchions, step-off pads, signage, equipment lockers, etc.

It is recommended that the Radiological Response Team (RRT) use REAC/TS or other similar poster instructions for the PPE doffing sequence to replace the existing sheet adjacent to the step off pad to allow easier viewing from a distance.

It is recommended that the ED Director hold joint radiological briefings with the Radiological Response Team staff and supporting Radiological Control Technicians from the H.B. Robinson Steam Electric Plant.

Lastly, it is recommended that ‘drill-related’ items from the hospital procedure (for example, on page 11 item D.8, “Talk through each step (for evaluator understanding and new staff training”) be removed. The procedure should include only response-related information.

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

## APPENDIX 6

### RECOMMENDATIONS

#### State of South Carolina:

- It is recommended that the State clarify county authorities pertaining to distribution of KI to EW and avoid issuing guidance that may be confusing in light of what is stated in Annex F of the SCORREP.
- It is recommended that back-up route alerting be physically conducted in a future exercise to determine if the process as currently envisioned is sufficient.
- The State of South Carolina DHEC should coordinate with HBRSEP to establish timely, accurate, and reliable data and information conduits from the site to the SEOC (and EOF) in order to conduct plant and dose assessments for the purpose of determining dose projections to be used in making protective actions for the health and safety of the public and emergency workers.

#### Chesterfield County:

- The Radiological Officer should develop a standard dosimetry/KI issuance briefing that can be used by knowledgeable staff performing his responsibilities in his absence.
- Consider developing checklists for each job function.
- Emergency workers should be provided with forms to record their individual readings from their direct-reading dosimeters (DRD).
- Emergency workers should be provided with forms to record their ingestion of Potassium Iodide (KI).
- Update route alert maps to reflect the new siren system, and provide copies to the designated fire and rescue squads.
- Establish procedures to assure that emergency workers involved in backup route alerting receive dosimetry and a radiological brief in advance of their being needed to perform backup route alert duties.
- Conduct drills to determine that backup route alerting could be conducted on all routes within 45 minutes of an identified siren failure.
- Although knowledgeable of the Chesterfield emergency worker and vehicle decontamination process, the First Health workers worked from a plot layout of the Chesterfield High School to assemble their operation. Forms and procedures were extracted from different plans to accommodate personnel and vehicle decontamination. A separate and dedicated plan annex detailing how to layout and equip Chesterfield High School for evacuee, emergency worker and vehicle monitoring and decontamination needs to be developed.
- A dedicated plan would contain specific steps on where to place equipment, and identify flow of evacuees, emergency workers and vehicles. In addition, the plan should identify staff positions and responsibilities. Inclusive should be check off lists for each location, and inventories required to equip the facility.
- All forms required for vehicle monitoring, evacuee and emergency worker monitoring, and other records required to perform these operations should be found in the annex.

- An individual annex for evacuees, emergency workers and vehicles would afford individual workers to be able reference the information and use it as a study tool to help them become proficient at assembling and performing this operation.
- Although knowledgeable of the Chesterfield emergency worker and vehicle decontamination process, the First Health workers worked from a plot layout of the Chesterfield High School to assemble their operation. Forms and procedures were extracted from different plans to accommodate personnel and vehicle decontamination. A separate and dedicated plan annex detailing how to layout and equip Chesterfield High School for evacuee, emergency worker and vehicle monitoring and decontamination needs to be developed.
- A dedicated plan would contain specific steps on where to place equipment, and identify flow of evacuees, emergency workers and vehicles. In addition the plan should identify staff positions and responsibilities. Inclusive should be check off lists for each location, and inventories required to equip the facility.
- All forms required for vehicle monitoring, evacuee and emergency worker monitoring, and other records required to perform these operations should be found in the annex.
- An individual annex for evacuees, emergency workers and vehicles would afford individual workers to be able reference the information and use it as a study tool to help them become proficient at assembling and performing this operation.
- The school procedures should be updated to reflect a current list of teachers and bus drivers.
- Conduct additional training for County emergency workers to ensure all are aware that they must receive a thorough radiological briefing prior to deployment.

#### **Darlington County:**

- The use of Permanent Record Dosimeters (PRD) was not demonstrated, nor was it discussed during briefings. Simulated PRDs were available for issuance in the EOC, but no simulated PRDs were included in the dosimetry kits. In order to comply with the Darlington County Emergency Operations (EOC) Plan, Annex S, Appendix 3 (Darlington County Dosimeter Distribution Plan), it is recommended that the Radiological Officer in the EOC assure, through the use of checklists that a simulated PRD is provided in the dosimeter kits for each worker.
- When sending RC messages to the EOC Manager the PIO should send them to the PIO at the JIC as well to ensure they are available to them for briefings. This would be a back up to verbal communication to ensure this information is provided to the JIC.

#### **Lee County:**

- Reception and Congregate Care: The ARC should come prepared with a current facility diagram, operating procedures for the specific shelter, and an ARC Shelter Operations Manual. These items are necessary if the staff is newer or during shift change to keep track of what was completed or ongoing.
- Dosimetry/KI Issuance: It is recommended that the RO develop a standard briefing to be followed during his service chief and individual issue process to ensure that all EW are provided sufficient guidance on personal protective measures and the unique aspects of KI.

- It is recommended that the RO develop a standard briefing to be followed during his mass and individual issue process to ensure that all EW are provided sufficient guidance on personal protective measures.
- It is recommended that the State clarify county authorities pertaining to distribution of KI to EW and avoid issuing confusing guidance.
- It is recommended that back-up route alerting be physically conducted in a future exercise to determine if the process as currently envisioned is sufficient.
- It is recommended that a common term be selected for the process of alerting the local populace within the 10-mile EPZ in the event of siren failure. The terms in question are: back-up route alerting or warning teams. The term back-up route alerting was used during the OOS interview. The term Warning Teams is stated in Annex Q, Fixed Nuclear Facility (FNF) Radiological Emergency Response Plan (RERP) to the Lee County Emergency Operations Plan (EOP), April 2004, Appendix 2 Paragraph 2.E.1. The use of two different terms for the same process can become confusing, please clarify.
- The ARC should come prepared with a current facility diagram, operating procedures for the specific shelter, and an ARC Shelter Operations Manual. These items are necessary if the staff is newer or during shift change to keep track of what was completed or ongoing.

#### **Florence County:**

- Darlington County Plans, Appendix 6, page 51, paragraph 6, indicates EMS workers entering a the 10-mile EPZ after a release should be instructed to ingest KI, this directive was not given during the exercise.
- Injects were provided to inform EMS workers of the patient's condition and level of contamination when they approached the patient at Darlington County Fire Station 12, this inject was not played out by the State Controller.
- Although the Radiological Emergency Area (REA) setup was adequate, it is recommended that the schematic be enlarged and provide sufficient detail to fully describe REA setup. Details should include description of ropes, stanchions, step-off pads, signage, equipment lockers, etc.
- It is recommended that the Radiological Response Team (RRT) use REAC/TS or other similar poster instructions for the PPE doffing sequence to replace the existing sheet adjacent to the step off pad to allow easier viewing from a distance.
- It is recommended that the ED Director hold joint radiological briefings with the Radiological Response Team staff and supporting Radiological Control Technicians from the H.B. Robinson Steam Electric Plant.
- Lastly, it is recommended that 'drill-related' items from the hospital procedure (for example, on page 11 item D.8, "Talk through each step (for evaluator understanding and new staff training)") be removed. The procedure should include only response-related information.