# Final Exercise Report

# V. C. Summer Nuclear Station

Licensee: **South Carolina Electric and Gas Company**

Exercise Date: **July 23,2003**

Report Date: **October 23,2003**

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**DEPARTMENT OF HOMELAND SECURITY**
**FEDERAL EMERGENCY MANAGEMENT AGENCY**
**REGION IV**
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# I. EXECUTIVE SUMMARY

On July **23. 2003,** a full participation exercise was conducted in the plume exposure pathway emergency planning zone (EPZ) around the V. C. Summer Nuclear Station by the Federal Emergency Management Agency (FEMA), Region IV. 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 (RERP) and procedures.

The previous exercise at this site was conducted on July 18,2001, and the qualifying emergency preparedness exercise was held in November **13,1981.**

FEMA wishes to acknowledge the efforts of the many individuals from the State of South Carolina, and Fairfield, Lexington, Newberry **and** Richland Counties who participated in this excrcise.

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

This report contains the evaluation of the biennial exercise **and** the following out-of-sequence activities: protective actions for schools, traffic and access control points, emergency worker decontamination, reception, temporary care for evacuees **and** a medical drill.

The State and local organizations, except where noted in this report. demonstrated knowledge of their emergency response plans and procedures **and** adequately implemented them. No Deficiencies and only two Areas Requiring Corrective Action (ARCA) were identified during this exercise. These ARCAs concerned 1) Direction **and** Control of the field team at the DIIEC Command Center and 2) the lack of a laboratory for sample analysis as specified in the extent-of-play agreement. Also during this exercise three **ARCAs** identified during the 2002 Oconee excrcise concerning the condition of the field team kits. deploying a field team without a high range instrument and sample preparation, transport and receipt were correcled. The correction of an ARCA identified during a 2001 medical drill concerning decontamination of the patient was also corrected.

# II. INTRODUCTION

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

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

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

- Taking the lead in offsite emergency planning and in the review and evaluation of RERPs and procedures developed by state and local governments;

- Determining whether such plans **and** procedures can be implemented on the **basis** of observation and evaluation of exercises of the plans and procedures conducted by state and local governments;

- Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June **17, 1993** (Federal Register, Vol. **58,** No. **176,** September 14, **1993);** and

- Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:

  - Department of Agriculture,
  - Department of Commerce,
  - Department of Energy,
  - Department **of** Health and Human Services,
  - Department of the Interior,
  - Department of Transportation,
  - Environmental Protection Agency,
  - Food and Drug Administration and
  - Nuclear Regulatory Commission.

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

Formal submission of the RERPs for the V. C. Summer Nuclear Station to FEMA Region IV by the State of South Carolina and involved local jurisdictions occurred on March 31, 1981. Formal approval of the RERPs was granted by FEMA on November 13, 1981, under Title 44 CFR 350.

A REP exercise was conducted on July 23,2003 by FEMA Region IV to assess the capabilities of State and local emergency preparedness organizations in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving the V. C. Summer Nuclear Station. FEMA also evaluated protective actions for schools during the week of May 8,2003. The purpose of this report is to present the exercise results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

The findings presented are based on the evaluations of the Federal evaluator team, with final determinations made by the Chief Evaluator and Region IV RAC Chairman, and approved by the Regional Director.

The criteria utilized in the FEMA evaluation process are contained in:

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980;
- "FEMA Radiological Emergency Preparedness: Exercise Evaluation Area Methodology," April 25, 2002.

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

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

# III. EXERCISE OVERVIEW

Contained in this section are data and basic information relevant to the July 23. 2003 exercise to test the offsite emergency response capabilities in the area surrounding the V. C. Summer Nuclear Station.

## A. Plume Emergency Planning Zone Description

The V. C. Summer Nuclear Station is located approximately 30 miles northwest of Columbia, South Carolina at the southern end of the Monticeilo Reservoir and near the western border of Fairfield County. The IO-mile EPZ includes portions of Fairfield, Lexington, Newberry *and* Richland Counties. The land use in the EPZ is rural in nature. The estimated permanent population in the EPZ is 10,880. Lake Monticello is the major recreational area in the EPZ. The State of South Carolina has divided the EPZ into 13 local planning zones.

## B. Exercise Participants

The following agencies; organizations, and units of government participated in the V. C. Summer Nuclcat Station exercise on July 23.2003.

**STATE OF SOUTH CAROLINA**

Office of the Adjutant General, Emergency Preparedness Division
Department of Health & Environmental Control, Bureau *of* Land Waste Management, Division of Health & Environmental Control
Department of Social Services
Department of Public Safety, Bureau of Protective Services and Highway Patrol
Department of Natural Resources, Law Enforcement Division

**RISK JURISDICTIONS**

Fairfield County
Lexington County
Newberry County
Richland County

**PRIVATE/VOLUNTEER ORGANIZATIONS**

American Red Cross
Radio Amateur Civil Emergency Service
Salvation Army

## C. Exercise Timeline

Table 1, on the following page, presents the time at which key events and activities occurred during the V. C. Summer Nuclear Station exercise on July 23, 2003. Included are times notifications were received or action was taken by the participating jurisdictions/functional entities.

# Table 1. Exercise Timeline

## DATE AND SITE: July 23, 2003 – V. C. Summer Nuclear Station

| Emergency Classification Level or Event | Time Utility Declared | Time That Notification Was Received or Action Was Taken | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | SEOC | DOSE | JIC | FAIRFIELD COUNTY | LEXINGTON COUNTY | NEWBERRY COUNTY | RICHLAND COUNTY |
| **Unusual Event** | | | | | | | | |
| **Alert** | 0807 | 0831 | 0830 | 0807 | 0828 | 0829 | 0840 | 0840 |
| **Site Area Emergency** | 0923 | 0945 | 0942 | 0945 | 0946 | 0951 | 0938 | 0934 |
| **General Emergency** | 1041 | 1056 | 1045 | 1041 | 1054 | 1104 | 1050 | 1050 |
| **Simulated Rad. Release Started** | 1037 | 1056 | 1045 | 1040 | 1054 | 1040 | 1107 | 1037 |
| **Simulated Rad. Release Terminated** | 1144 | 1209 | 1203 | 1145 | | | | |
| **Facility Declared Operational** | | 0845 | 0830 | 0812 | 0946 | 0953 | 0845 | 0905 |
| **Declaration of State of Emergency:** State<br>Local | | 0910 | | 0910 | 0945 | 1012<br>1015 | 0920<br>0945 | 0934<br>0951 |
| **Exercise Terminated** | | 1233 | 1241 | 1237 | 1157 | 1212 | 1214 | 1206 |
| **Early Precautionary Actions:**<br>Lake Clearance | | | | | 1018 | | | |
| **1st Protective Action Decision**<br>Stay Tuned Message | | 0952 | | | 0952 | 0952 | 0952 | 0952 |
| **1st Siren Activation ***<br>Backup Route Alerting | | 0958 | | | 0958 | 0958 | 0958 | 0958<br>1009 |
| **1st EAS Message** | | 1001 | | | 1001 | 1001 | 1001 | 1001 |
| **2nd Protective Action Decision**<br>**Evacuate Zones:** A0. B1. B2. C1. C2<br>Sheller **Zones:** All others | | 1120 | | 1120 | 1120 | 1120 | 1120 | 1120 |
| **2nd Siren Activation**<br>Backup route alerting | | 1123 | | | 1123 | 1123 | 1123<br>1145 | 1123 |
| **2nd EAS Message** | | 1127 | | | 1127 | 1127 | 1127 | 1127 |
| **KI Decision:**<br>1) Distribute to emergency workers<br>2) Emergency workers in evacuation zone to ingest. | | 1005<br>1145 | 1146 | | 1018<br>1142 | 1021 | 1020 | |

NOTE: * Sirens are activated from the plant site

# IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities which participated in the July 23,2003 exercise to test the offsite emergency response capabilities of State and local governments in the 10-mile EPZ surrounding the V. C. Summer Nuclear Station.

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

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

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

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

# Table 2. Summary of Exercise Evaluation

**DATE AND SITE: July 23,2003 – V. C. Summer Nuclear Station**

| ELEMENT/Sub-Element | STATE | JIC | RAD HEALTH | DOSE ASSESSMENT | EOF | LP-1 | FAIRFIELD COUNTY | LEXINGTON COUNTY | NEWBERRY COUNTY | RICHLAND COUNTY |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. EMERGENCY OPERATIONS MANAGEMENT** | | | | | | | | | | |
| 1.a.1. Mobilization | M | M | | M | M | | M | M | M | M |
| 1.b.1. Facilities | M | M | | M | M | | M | M | M | M |
| 1.c.1. Direction and Control | M | | M | M | | | M | M | M | M |
| 1.d.1. Communications Equipment | M | | M | M | M | | M | M | M | M |
| 1.e.1. Equipment & Supplies to Support Operations | M | M | M | M | M | | M | M | M | M |
| **2. PROTECTIVE ACTION DECISION MAKING** | | | | | | | | | | |
| 2.a.1. Emergency Worker Exposure Control | M | | M | | | | M | M | M | M |
| 2.b.1. Rad Assessment & PARs & PADs Based on Available Info | | | M | | | | | | | |
| 2.b.2. Rad Assessment and PARs and PADs for the General Public | M | | M | | | | M | M | M | M |
| 2.c.1. Protective Action Decisions for Special Populations | M | | | | | | | | | |
| 2.d.1. Rad Assessment & Decision Making for Ingestion Exposure | | | | | | | | | | |
| 2.e.1. Rad Assessment & Decision Making for Relocation, Re-entry & Return | | | | | | | | | | |
| **3. PROTECTIVE ACTION IMPLEMENTATION** | | | | | | | | | | |
| 3.a.1. Implementation of Emergency Worker Control | M | | | M | M | | M | M | M | M |
| 3.b.1. Implementation of KI Decisions | M | | | | M | | M | M | M | M |
| 3.c.1. Implementation of PADs for Special Populations | | | | | | | M | M | M | M |
| 3.c.2. Implementation of PADs for Schools | | | | | | | M | M | M | |
| 3.d.1. Implementation of Traffic and Access Control | M | | | | | | M | M | M | M |
| 3.d.2. Impediments to Evacuation and Traffic and Access Control | M | | | | | | M | 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 | | | | | | | | | | |
| **4. FIELD MEASUREMENT and ANALYSIS** | | | | | | | | | | |
| 4.a.1. Plume Phase Field Measurement & Analysis Equipment | | | | A | | | | | | |
| 4.a.2. Plume Phase Field Measurement & Analysis Management | | | | | | | | | | |
| 4.a.3. Plume Phase Field Measurements & Analysis Procedures | | | | | | | | | | |
| 4.b.1. Post Plume Field Measurement & Analysis | | | | | | | | | | |
| 4.c.1. Laboratory Operations | | | | A | | | | | | |
| **5. EMERGENCY NOTIFICATION & PUBLIC INFO** | | | | | | | | | | |
| 5.a.1. Activation of Prompt Alert and Notification | M | | | | | | M | M | M | M |
| 5.a.2. Activation of Prompt Alert and Notification 15-Minute (Fast Breaker) | | | | | | | | | | |
| 5.a.3. Activation of Prompt Alert and Notification Backup Alert and Notification | | | | | | | M | M | M | M |
| 5.b.1. Emergency Info and Instructions for the Public and the Media | M | M | | | | M | M | M | M | M |
| **6. SUPPORT OPERATIONS/FACILITIES** | | | | | | | | | | |
| 6.a.1. Monitoring and Decon of Evacuees and EWs and Registration of Evacuees | | | | | | | M | M | M | M |
| 6.b.1. Monitoring and Decon of Emergency Worker Equipment | | | | | | | M | M | M | M |
| 6.c.1. Temporary Care of Evacuees | | | | | | | M | M | M | |
| 6.d.1. Transport and Treatment of Contaminated Injured Individuals | | | | | | | | | M | |

**LEGEND:** M = Met D = Deficiency A = ARCA

**B.** Status **of** Jurisdictions Evaluated

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

- Met - Listing of the demonstrated exercise criteria under which no Deficiencies or **ARCAs** were assessed during this exercise and under which no **ARCAs** assessed during prior exercises remain unresolved.

- Deficiency - Listing of the demonstrated excrcise criteria under which one or more Deficiencies was assessed during this exercise. Included **is** a description of each Deficiency and recommended corrective actions.

- Area Requiring Corrective Actions - Listing of the denionstrated exercise criteria under which one or more **ARCAs** were assessed during the current exercise or **ARCAs** assessed during prior exercises remain unresolved. Included is a description **of** the **ARCAs** assessed during this exercise and the recommended corrective action to bc demonstrated before or during the next biennial exercise.

- Not Demonstrated - Listing of the exercise criteria which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.

- Prior ARCAs - Resolved - Descriptions of **ARCAs** assessed during previous exercises which were resolved in this exercise and the corrective actions demonstrated.

- Prior **ARCAs** - Unresolved - Descriptions of **ARCAs** assessed during prior exercises which were not resolved in this exercise. Included is the reason the **ARCA** remains unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

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

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

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

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

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

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

# 1. STATE OF SOUTH CAROLINA

## 1.1 State Emergency Operations Center

The State Emergency Operations Center (SEOC) is an excellent facility, well designed and equipped for centralized management of emergency operations. The Operatiom Officer, supported by the Director of the Emergency Management Division, did an excellent job. The SEOC staff and Emergency Support Function (ESF) representatives were well trained and worked as a team. The ESFs were actively involved in meeting the needs and requirements of the counties, the development of protective action decisions (PAD), and alerting the public. Communication system worked well throughout the exercise.

**a.** **MET:** Criteria 1.a.1, 1.b.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 Radiological Health

The Department of Health and Environmcntal Control's (DHEC) Nuclear Response and Environmental Surveillance Section (NRESS) personnel. located at the SEOC, were responsible for the State's technical analysis of the situation at the V. C. Summer Nuclear Station. The Radiological Emergency Response Coordinator was in charge of the NRESS. The NRESS team provided oversight of the assessment and comparison of licensee and field team data and developed appropriate protective action recommendations (PAR). The team's technical knowledge and demonstrated direction and control of DHEC resources, resulted in an early PAD to issue potassium iodide (KI) to emergency workers. They also conducted a detailed review of plant recommendations subsequent to a radiation release. The NRESS staff coordinated with appropriate SEOC ESF representatives on PARs affecting their functional areas and provided recommendations to the Chief of Operations.

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

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

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

## 1.3 Dose Assessment

Dose assessment was performed by a competent staff at DHEC's Farrow Road Command Center. The dose assessments agreed with those of the utility within a factor of two. The direction and control of the single field team was impeded by a lack of support staff and difficulties in communicating with the team in the affected area. The field samples were delivered to the DHEC Command Center and were appropriately processed. However, no laboratory facilities were available although it was stated in the extent-of-play-agreement that they would be in use.

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

**b.** **DEFICIENCY:** NONE

**c.** **AREAS REQUIRING CORRECTIVE ACTION:**

**Issue No.:** 61-03-4.a.2-A-01

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

Because of these communications shortfalls, several problems resulted in the management of field team activities. Briefly, the field team misinterpreted a message to distribute KI, but rather team members ingested KI. Additionally, while the field team was advised to initiate radioiodine air sampling, the Field Team Director neglected to follow-up on the status of the air samples; consequently, no calculation of thc 1-13 I concentration fiom the air samples was received.

The problems identified with measurement and analysis management resulted while managing only one field team. Managing more than one team would only have magnified these problem.

**Possible Cause:** The staff assigned to managing the field monitoring team was insufficient to provide and obtain all required information. One person, the Field Team Director. **was** not able to effectively manage field team attitudes and serve as the field team communicator. The field team was deployed to **a** geographically low-lying area where the radio and cell phone coverage was spotty.

**Reference:** NUREG-0654H.12; **1.8,** 11; J10.a

**Effect:** The State did not effectively manage the one field team dispatched and the plume they sought to define was relatively narrow. Management of multiple teams that would he required to define the boundaries of a more dispersed plume would have been more problematic because the Field Team Director was not given support staff and communications ***to*** the area was spotty. Even though the Field 'Team Director was able, at times, to relay information to the team through the runner, the information flow time was greatly increased and added to the demands on the Director. The breakdown in communication with the field team resulted in the misinterpretation of an important message and in the loss of potentially important information. The effectiveness of the field team was greatly reduced and could have been further impaired if more field teams had required direction.

**Recommendations:** Sufficient staff should be provided **to support** field operations, support staff and field team members. Review communications coverage in **the** affected area and determine if improvements in reception can be achieved.

**Schedule of Corrective Actions:** The DNEC Forward Emergency Operations Center (FEOC) will be staffed in accordance with established SOP's. This will provide the Field Team Director with sufficient support personnel to complete their duties effectively and should demonstrate **a** clear communication of sampling/protective action decisions and recording of collected sampling information.

**Issue No.:** 61-03-4.c.1-A-02

**Condition:** Samples were delivered from the field team **to** DHEC at the Farrow Road Command Center and were processed quickly and efficiently. However, a mobile laboratory or other laboratory was not available to perform the required radiological analysis as specified in the **plans** and the extent-of-play-agreemcnt.

**Possible Cause:** Laboratory facilities were not available.

**Reference: NUREG-0654,** C.3, I.8, and .9, J.I1

**Effect:** Sample analysis results needed to confirm or institute protective actions would be delayed until **some** other organization (government or commercial) could

perform the necessary analysis. This criterion could not be demonstrated. DIIEG stated they would contract with a commercial laboratory, however, the contrast was not presented. The ability of the contract laboratory tu provide timely testing for the required **sample** types was not demonstrated.

**Recommendation**: Demonstrate a capability to have radiological laboratory analysis performed on collected samples.

**Schedule of Corrective Actions:** The Department's mobile radiological laboratory will be deployed *to* the FEOC for sample receipt and analysis. They will demonstrate the ability to screen samples at the exclusion zone, analyze accepted samples, and transmit data results to the FEOC field director and SEOC DHEC emergency response coordinator.

in response **to** FEMA letters dated September 4-5, 2003, all DIIEC FEOC staff **will** be deployed from the Farrow Road Command Center to the Darlington Armory. Communications equipment will be pre-staged.

**d. NOT DEMONSTRATED:** NONE

**e. PRIOR ARCAs - RESOLVED:** NQNE

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

## 1.4 Field Monitoring Team

Only one field monitoring team (FMT) was deployed by the State of South Carolina for this exercise. The tcam was composed of two members from the Division **of** Waste Assessment and Emergency Response, DIIEC. The FMT inventoried its collection equipment and supplies, checked **out** proper dosimetry and prepared ***lo*** **go** to their first assigned location. The FMT demonstrated the primary (radio) and backup (cellular phone) communications system. Communications were spotty because of the terrain in the EPZ. They were able to communicate with the command center by relaying information through the runner team. The FMT knew their call back and turn **back** values The FMT demonstrated the appropriate use of equipment and procedures for determining field radiation measurements. The FMT also collected air, vegetation and soil samples. The samples **were** packaged and labeled ***in*** accordance with their procedures and transferred to the runner **team** for transport hack to the command center. The FMT corrected two **previous** ARCA's identified during the 2002 Oconee Exercise.

**a. MET:** Criteria 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 ACTHOW:** NONE

**d.** **NOT DEMONSTRATED:** NONE

**e.** **PRIOR ARCAs - RESOLVED:**

**Issue No.:** 42-02-4.a.Z-A-03

**Description:** The field monitoring kids were not organized and labeled to indicate each kit's contents. The radiation monitoring instruments did not have information on the calibration label that identified the expected response value.

**Corrective Action Demonstrated:** The field monitoring kits were well organized and each kit was labeled identifying the supplies and collection equipment in each kit. Each radiation monitoring instrument was labeled indicating the expected response value.

**Issue No.:** 42-02-$.a. I-A-04

**Description:** The field monitoring team deployed to the field without a high-range gamma survey instrument.

**Corrective Action Demonstrated:** An Eberline Model RO 20 gamma survey instrument was available and operable for use by the FMT should the need arise.

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

## 1.5 Emergency Operations Facility

The **V. C.** Summer Emergency Operations Facility (EOF), located on-site in the facility's training center, is a facility from which all participating response organizations can effectively manage ongoing emergency operations.

Communications and coordination among the State officials deployed to the EOF, as well as with the utility operator's response **team** were outstanding. The availability and flow of technical information **was** timely and accurate. This allowed all response organizations to effectively conduct **an** independent accident analysis, and ***to*** develop appropriate protective actions.

All State officials who deployed to the EOF were **well** trained, knowledgeable, followed procedures, and overall performed their respective responsibilities in **an** efficient and professional manner.

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

## 1.6 Emergency Alert System Station

The Emergency Alert System (EAS) Coordinator and his staff were very knowledgeable and professional in performing their duties. The Coordinator is highly skilled in EAS operations and testing procedures. The manner and enthusiasm with which the Coordinator performed his duty is a credit to emergency preparedness,

a. **MET:** Criterion 5.b.1.

b. **DEFICIENCY:** NQNE

e. **AHEAS REQUIRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

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

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

## 1.7 Joint Information Center

The Joint Information Center (JIC) staff successfully demonstrated **the** policies and procedures outlined in the State plan and the JIC standard operating procedures (SOP). The JIC was promptly activated and key County, State and utility personnel conducted the first of six news conferences within 15 minutes of activation. Continual coordination with State and County emergency operations centers (EOC) and the plant enabled the JIC staff to prepare and distribute vital information to the affected population. The information presented in news conferences was clear and detailed. In addition to the news conferences, eight State, nine county and two utility news releases were prepared and dispatched. Utility and State personnel staffed the Public Information Center and rumor control phone lines, provided accurate responses *to* the public, and identified trends that could affect the success of ongoing response efforts. The JIC staff were competent and professional.

a. **MET:** Criteria 1.a.1, 1.b.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

## 1.8 Traffic Control Points

All five of the State traffic and access control points (STACP) associated with the VC Summer Nuclear Station were evaluated. Each STACP was staffed by a different South Carolina State Trooper at the on scene locations. The troopers had appropriate dosimetry, KI tablets (simulated) and written instructions on the use of each. They knew radiological exposure control procedures. Each trooper was also extremely knowledgeable of the procedures for setting up the STACP, including controlling and diverting traffic and who to contact to remove my impediments to evacuation.

a. **MET:** Criteria 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 FAIRFIELD COUNTY

### 2.1.1 Emergency Operations Center

The EOC, co-located with the County's 911 center, was activated following notification of an Alert at the V.C. Summer Nuclear Station. The EOC's limited space was well configured to support emergency operations. Participation by County and elected officials was reflective of the County's commitment to selfless service and public safety. Representatives from the State and utility provided valuable assistance to the County.

The Acting Emergency Management Director effectively managed EOC operations and the EOC staff was knowledgeable and performed their duties well. The County actively

participated in protective action decision-making and provided clear and concise guidance to emergency workers, special needs individuals, and the general population.

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

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

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

### 2.1.2 Protective Action for Schools

School relocation interviews were conducted in Fairfield County on May **8,2003.** McCorey-Listen Elementary School personnel were knowledgeable of the **school** safety plans and procedures. The school is notified of **an** incident at the V.C. Summer Nuclear Station via telephone from the County EOC or over **a** tone alert radio activated by the V.C. Summer Station. A *select* number of buses are available **at** the school during the day and more buses are available at the **high** school in the evert students need ***to*** be relocated. School personnel are assigned to buses and ride with students to the relocation center. Law enforcement personnel **will** escort the buses, Bus drivers are capable **of** communicating with **the** school and other buses. School staff receives **annual** training on the safety **plans.**

**a.** **MET:** Criterion 3.c.2.

**b.** **DEFICIENCY:** NONE

**e.** **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

Traffic control points (TCP) for Fairfield County were demonstrated through interview with an officer from the Fairfield County Sheriff's Department and inspection of the County Department of Transportation (DOT) material to assist with the set up of the TCPs. The officer was knowledgeable of the Fairfieid County TCPs, how to request resources, reception center locations, dosimetry and KI. The officer was issued appropriate dosimetry and KI. Procedures for the ingestion of KI, the use of dosimetry and plans were also included in the go kit. The DOT has all the equipment and supplies needed to support the Sheriff's Department.

a. **MET:** Criteria 3.a.1, 3.b.1, 3.d.1 and 3.d.2.

b. **DEFICIENCY:** NONE

*e.* **AREAS REQUXRING CORRECTIVE ACTION:** NONE

d. **NOT DEMONSTRATED:** NONE

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

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

### 2.1.4 Lake Warning

The ability to clear Lake Monticello was demonstrated during interviews with an officer from the Department of Natural Resources (DNR) at three of the public boat landings. The officer was familiar with the area to be alerted and was well versed in the DNR Emergency Operation Procedures. He had appropriate dosimetry, KI and instructions for all equipment. The three landings had signs posted with emergency information for the boating public.

a. **MET:** Criteria 3.a.1, 3.b.1 and 5.a.3.

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

E **PRIOR ARCAs - UNRESOLVED:** NONE

## 2.1.5 Reception and Congregate Care

The White Oak Conference Center was used for reception and congregate care. They were jointly operated by the Fairfield County EMA, the Fairfield County Department of Social Services (DSS), the Dutch Creek Volunteer Fire Department and the American Red Cross (ARC).

Fire Department personnel properly established and operated the portal monitor and directed evacuees either lo the reception area or to a portable decontamination shower setup. Reception registration was well organized and staffed with trained DSS personnel. Good procedures, using control lines and green or red stickers, were in place to ensure no evacuees were permitted to enter without having been monitored for contamination. ARC personnel were on site to operate the shelter. The Conference Center is an excellent facility to conduct reception and congregate care operations.

The majority of the County personnel, in particular the Fire Department and ARC, are volunteers, and are to be commended for their support and the level of training and proficiency which they have achieved. All personnel were proficient, pleasant and professional.

**a.** **MET:** Criteria 3.a.1, 3.b.1, 6.a.1 and 6.c.1.

**b.** **DEFICIENCY:** NONE

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

**a.** **NOT DEMONSTRATED:** NONE

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

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

## 2.1.6 Emergency Worker Decontamination

The Dutch Creek Volunteer Fire Department demonstrated its capability to conduct emergency worker decontamination (EWD) operations. Setup and operation of the portal monitor, and the issue and operation of dosimeters and instruments were correctly performed. The fire department also set up and operated the portable shower facility for personnel decontamination, as well as the site for emergency vehicle decontamination. Both designated areas provided for drainage and runoff of water for contamination control. All personnel were knowledgeable of radiological exposure control.

a. **MET:** Criteria 1.b.1, 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 LEXINGTON COUNTY

### 2.2.1 Emergency Operations Center

The EOC is a small, but efficient, facility with all the necessary equipment, maps and communications to effectively manage any incident. The Emergency Management Director provided excellent direction and control during the exercise. The staff was frequently briefed and provided feedback to the rest of the staff on their current activities. The County Administrator was present to assist in the decision-making process. **All** activities were conducted in a professional and expeditious manner.

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

b. **DEFICIENCY** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

### 2.2.2 Protective Action for Schools

School relocation interviews were conducted in Lexington County **on** May **8,2003** with the Assistant Principal from Chapin High School, Director of Transportation, and a Sheriffs Deputy assigned to the school. Personnel were very knowledgeable of the school safety plans and procedures. **A** school would be notified of an incident at V.C. **Summer** Station by the County EOC Director and by tone alert radio activated by the station. The Director of Transportation indicated that the required buses are available to relocate

students. Parents are provided information annually **on** school relocation plans and procedures. School staff is trained annually on specific duties for relocation **of** students to the host school.

**a.** **MET:** Criterion 3.c.2.

**b.** **DEFICIENCY:** NONE

**e.** **AREAS REQUIRING CORRECTWE ACTION:** NONE

**d.** **NOT DEMONSTRATED:** NONE

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

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

### 2.2.3 Traffic Control Points

Two Lexington County Sheriffs Deputies denionstrated superior knowledge and familiarity with the plans, operation of traffic control locations, communication capability and personnel dosimetry. The deputies were also very knowledgeable about the procedures to remove impediments **to** evacuation.

**a.** **MET:** Criteria 3.a.1, 3.d.1 and 3.d.2.

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

**f.** **PRIOR ARCAs - UNRESOLVED:** NQNE

### 2.2.4 Reception and Congregate Care

Monitoring, decontamination and registration of evacuees was demonstrated at the Lexington Fire Department Training Center. Separate areas were available for parking clean and contaminated vehicles. Emergency workers were knowledgeable of monitoring procedures, exposure control, KI, **and** dosimetry as **well** as how to avoid contamination. Fire department personnel were well prepared for evacuees and successfully monitored **and** decontaminated evacuees according to current SOPs. **A** boy scout troop volunteered to provide personnel **for** decontamination, registration and processing into the congregate care center once they were cleared for entry. The congregate care center was staffed by

the local chapter of the *ARC* and was evaluated by interview and a walkthrough. The shelter manager was knowledgeable of shelter operations. All essential services were represented in the facility. Lexington County Police Department provided security for the facility.

**a.** **MET:** Criteria 1.b.1, 1.e.1, 3.a.1, 6.a.1 and6.c.l.

**b.** **DEFICIENCY:** NONE

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

**a.** **NOT DEMONSTRATED:** NONE

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

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

## 2.2.5 Emergency Worker Decontamination

EWD was accomplished at the Lexington Fire Department Training Center. The EWD staff was competent in the use of the Ludlum Model 3 monitors. 'Workers exited their vehicle and entered the EWD site that was marked with yellow tape and safety cones. **At** the first station emergency workers removed any contaminated equipment and placed it on a table to be cleaned. Each contaminated emergency worker was decontaminated **by being** processed through a portable shower tent and was then monitored again. Replacement clothing was available following successful decontamination and monitoring.

**a.** **MET:** Criteria 1e.1, 3.a.1, 6.a.1 and6.b.I.

**b.** **DEFICIENCY:** NONE

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

**a.** **NOT DEMONSTRATED:** NONE

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

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

# 23 NEWBERRY COUNTY

## 2.3.1 Emergency Operations Center

The new EOC **for** Newberry County is located in the Sheriff's Office. The Director of Public Safety provided positive and professional leadership **and** involved his competent and cooperative staff in the decision making process. The dutiful PIO, State liaison, utility representative and amateur radio personnel provided vital support. The State **and** the counties coordinated all PADs. The new EOC **and** equipment supported this successful emergency **response** operation.

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

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

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

## 2.3.2 Protective Action for Schools

School relocation interviews were conducted in Newberry County on May **8, 2003,** with the Principal **of** Little Mountain Elementary School and Transportation Coordinator. The Principal had a pian and was knowledgeable **of** action required in response to **an** incident at V.C. Summer. **Several** school buses are left at the school with qualified staff to operate them. The transportation coordinator discussed plans and procedures for providing additional buses to relocate students to the host county.

**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

### 2.3.3 Traffic Control Points

Two Newberry County Sheriff's Officers demonstrated the capability to establish TCPs through an interview. The officers were knowledgeable of their Iocations and the logistics of operating a TCP as well as dosimetry requirements. call in and turnback values and when to take KI.

**a.** **MET:** Criteria 1.e.1, 3.a.1, 3.b.1 and3.d.l.

**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

Monitoring, decontamination and registration of evacuees was demonstrated at the Newberry County High School. Separate areas were available for parking clean and contaminated vehicles. Helpful signs were placed outside to aid in directions to each location and for parking. Emergency workers were knowledgeable of monitoring procedures, dosimetry, exposure control; KI, and how to limit cross contamination. The Newberry Fire Department personnel were well prepared and successfully monitored and decontaminated evacuees. A senior citizens volunteer group acted as "evacuees." Personnel appropriately registered and tracked evacuees. Amateur Radio Emergency Services ***(ARES)*** provided communications for the center.

ARC successfully demonstrated congregate care through interview and a walkthrough. The shelter manager was knowledgeable of shelter operations. All essential services were represented in the facility. Personnel responsible for health, food, mental health counseling and sleeping services were knowledgeable of their duties. The facility has a capacity to care for over 600 evacuees. Newberry Police Department and National Guard soldiers provided security. The shelter manager indicated that additional resources arc available to accommodate more evacuees.

**a.** **MET:** Criteria 1.b.1, 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

### 2.3.5 Emergency Worker Decontamination

EWD was accomplished at **the** Newberry Fire Station. The decontamination staff was knowledgeable and successfully monitored and decontaminated emergency **workers.** Replacement clothing was available following decontamination.

**a.** **MET:** Criteria 1.c.1, 3.a.1, 3.b.1, 6.a.1 and 6.b.1

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

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

### 2.3.6 Medical Drill

The V. C. Summer Medical Service Drill was conducted on July 22,2003. Organizations involved m the medical drill included Newberry County Emergency Medical Services **(EMS) and** Newberry County Memorial Hospital. The drill was initiated when EMS personnel were dispatched by the **911** center to care **for** a solid waste supervisor **who** was involved in a recycling trailer accident where she suffered a broken right leg. The accident occurred in an area where there had been **a** release **of** radioactive iodine and noble gases **into** the environment, exposing the patient **to** radioactive contamination.

EMS personnel used appropriate contamination control methods at the accident site. They spread a sheet on **the** ground and placed the backboard on **the** sheet. Medical supplies and equipment were also placed **on** the sheet to prevent them from becoming contaminated. EMS personnel promptly assessed the medical condition of the patient, placed bandages on the patient's left leg, and moved the patient *to **the*** backboard. After placing the patient on the backboard, EMS personnel covered her with a sheet. **She** was loaded on the ambulance and transported to Newberry County Memorial Hospital. EMS personnel notified the emergency room (ER) staff at the hospital of the medical condition and contamination **levels** found on the patient. They also provided an estimated time **of** arrival (ETA).

EMS personnel had well insulated the ambulance to prevent contamination. **EMS** personnei carried appropriate direct-reading and permanent-record dosimetry, were knowledgeable of its use, and performed operational checks on monitoring equipment. They also wore full protective **clothing** and were familiar with exposure limits and the purpose of KI.

The hospital prepared well for the arrival of the patient. Plastic had been placed on the area where the patient was to be unloaded. After backing the ambulance **up** to the covered entrance to the ER, EMS personnel provided a thorough briefing to ER staff on the condition of the patient. The patient was then transferred to a clean gurney which was rolled into the ER. ER personnel used appropriate monitoring, contamination control, and decontamination procedures. This was done repetitiously until the contamination was completely removed. The staff took **nasal,** wound, and saliva samples. After the decontamination process was completed, the patient was thoroughly surveyed. Appropriate exit procedures were followed in carrying the patient out of the ER.

EMS personnel arid the vehicle were properly surveyed and released. The monitor knew to survey the ambulance around the tire area, inside of the vehicle, and under the hood. The ambulance and personnel are actually decontaminated at a location away from the hospital. The **ARCA** from the 2001 exercise was corrected during this demonstration.

**a.** **MET:** Criteria 1.a.1, 1.c.1, 3.a.1, 3.b.1 and 6.d.1.

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

**e.** **PRIOR ARCAs- RESOLVED:** YES

**Issue No.:** 61-01-21-A-03

**Description:** The hospital's RRT did not adequately demonstrate decontamination of the patient. Only a minimal amount of sterile water was used to cleanse the wounds (less than a quart) and some of the water ended up on the floor. Injects from the controller to the RRT indicated that contamination on the patient had been reduced to background. At termination, the patient **was** still laying on the sheet that she had been placed on at the Cannon`s Creek Public Boat Landing. Both the sheet and the patient still had freshly cut grass clippings on them from the pick up location.

**Corrective Action Demonstrated:** In the ER, the staff used appropriate monitoring, contamination control and decontamination procedures. The patients clothing and covering from the accident area wcre removed before the cleaning of

the wound was started. The staff appropriately monitored the area and used an abundance of water to remove contamination. This was done repetitiously until the contamination was completely removed. The staff took nasal, wound, and saliva samples. The staff changed gloves frequently, dried the patient's wound before each monitoring, carefully controlled the flow of water and placed drapes around the injured leg wound to prevent the spread of contamination.

e **PRIOR ARGAs – UNRESOLVED:** NONE

## 2.4 RICHLAND COUNTY

### 2.4.1 Emergency Operations Center

*The* Emergency Management Agency Deputy Director effectively managed the EOC. The staff was well trained and worked effectively together. Instructions were given at the initial briefing regarding forms and processes used in the EOC operation. Several individuals monitored exercise communications, which were received from various sources. The EOC was well run and professionally staffed.

a. **MET:** Criteria 1.a.4, 1.b.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 3.a.1, 3.b.1, 3.c.1, 5.a.1, 5.a.3 and 5.b.1.

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

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

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

### 2.4.2 Traffic Control Points

TCPs were evaluated by interview with a Sheriffs' deputy ab the EOC. The deputy had the required dosimetry and KI (simulated), knew the call-in and turn-hack values and was familiar with the procedures for TCPs. He was also knowledgeable of the procedures used for backup route alerting, if needed.

a. **MET:** Criteria 1.e.1, 3.a.1, 3.d.1 and 5.a.3.

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING (CORRECTIVE ACTHOW:** NONE

**d.** **NOT DEMONSTRATED:** NONE

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

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

### 2.4.3 Reception Center

The reception center was located at Dutch **Fork** High School and was jointly operated by Columbia/Richland Fire Service, Richland County Emergency Management Division (EMD), EMS, DSS, Sheriff's Office and the ARC. The Richland County EMD Coordinator was clearly in charge and effectively ran the operation. The instruments were issued and logged per the operations **plan.** EMD personnel properly set **up,** operated the portal monitor and directed evacuees to **the** reception area or the decontamination shower. Registration was well organized and staffed with trained DSS personnei. Good procedures. using control lines and green and red stickers, were in place to ensure no evacuees were permitted to enter without having been monitored for contamination. **DSS** counselors and ***ARC*** personnel were on site to provide counseling and support. Since Richland County does not provide shelters, evacuees would be lodged in area motels. All personnel were proficient, pleasant and professional.

**a.** **MET:** Criteria 1.e.1, 3.a.1 and6.a.l.

**b.** **DEFICIENCY:** NONE

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

**d.** **NOT DEMONSTRATED:** NONE

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

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

### 2.4.4 Emergency Worker Decontamination

The Columbia/Richland Fire Service successfully demonstrated their capability **to** conduct EWD operations. **Issue** and operation of dosimeters and instruments were correctly performed. Personnel operating a Model 52 portal monitor and those equipped with the Ludlum Model-3 portable instruments were proficient, well trained and took exceptional care to prevent cross-contamination by good use of protective film wrap. The area designated for emergency vehicle decontamination provided for drainage and runoff of water. Actual traffic control of vehicles entering the area was well demonstrated by the Richland County Sheriffs Office in segregating contaminated vehicles. All personnel displayed an understanding of radiological exposure control.

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

# 3. SUMMARY OF AREAS REQUIRING CORRECTIVE ACTION

## 3.1 2003 ARCAs

### 3.1.1 61-03-4.a.2-A-01 SEOC Dose Assessment

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

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

The problems identified with measurement and analysis management resulted while managing only one field team. Managing more than one team would only have magnified these problems.

**Possible Cause:** The staff assigned to managing the field monitoring team was insufficient to provide and obtain all required information. One person, the Field Team Director, was not able to effectively **manage** field team attitudes and serve as the field team communicator. The field team was

deployed to a geographically low-lying area where the radio and cell phone coverage was spotty.

**Reference:** NUREG-0654H.12; I.8, 11; J10.a.

**Effect**: The State did not effectively manage the one field team dispatched and the plume they sought to define was relatively **narrow.** Management of multiple teams that would be required to define the boundaries of a more dispersed plume would have been more problematic because the Field Team Director was not given support staff and communications to the area was spotty. Even though the Field Team Director was able, at times, to relay infonnation to the team through the runner, **the** information flow time was greatly increased and added to the demands on the Director. The breakdown in communication with the field team resulted in the misinterpretation *of* an important message and in the loss of potentially important information. The effectiveness of the field team was greatly reduced and could have been further impaired if more field team had required direction.

**Recommendations:** Sufficient staff should be provided ***to*** support field operations, support staff and field team members. Review communications coverage in the affected area and determine if improvements in reception **can** be achieved.

**Schedule of Corrective Actions:** The DHEC Forward Emergency Operations Center (FEOC) will be staffed in accordance with established SOP's. This **will** provide the Field 'Team Director with sufficient support personnel tu complete their duties effectively **and** should demonstrate a clear communication of sampling/protective action

decisions and recording of collected sampling information.

**3.1.2 61-03-4.~1-A-02**
**SEOC**
**Dose Assessment (2)**

**Condition:** Samples were delivered from the field team to DHEC at the Farrow Road command center and were processed quickly and efficiently. However, a mobile laboratory or other laboratory was not available to perform the required radiological analysis as specified in the plans and the extent-of-play-agreement.
**Possible Cause:** Laboratory facilities were not available.

**Reference:** NUREG-0654, C.3, I.8, and .9, J.11.

**Effect:** Sample analysis results needed **to** confirm or institute protective actions would be delayed until some other organization (government or commercial) could perform the necessary analysis. This criterion could not be demonstrated. DHEC stated they would contract with a commercial laboratory, however, the contract was not presented. The ability of the contract laboratory to provide timely testing for the required sample types was not demonstrated.

**Recommendation:** Demonstrate a capability to have radiological laboratory analysis performed on collected samples.

**Schedule of Corrective Actions:** The Department's mobile radiological laboratory will be deployed **to** the FEOC **for** sample receipt and analysis. They will demonstrate the ability to screen samples at the exclusion zone, analyze accepted samples, and transmit data results to the FEOC field director and SEOC DNEC emergency response coordinator.

In response to **FEMA** letters dated September **4-5,2003,** all DHEC FEOC staff

will be deployed from the Farrow Road command center to the Darlington Armory. Communications equipment will be pre-staged.

## 3.2 PRIOR ARCAs - RESOLVED

**3.2.1 42-02-4.a.B-A-03**
**SEOC**
**Field Monitoring Team**

**Description:** The Field Monitoring Kits were not organized and labeled to indicate each kit's contents. The radiation monitoring instruments did not have information on the calibration label that identified the expected response value.

**Corrective Action Demonstrated:** The field monitoring kits were well organized and each **kit** was labeled identifying the **supplies** and collection equipment in each kit. Each radiation monitoring instrument was labeled indicating the expected **response** value.

**3.2.2 42-02-4.a.1-A-04**
**SEOC**
**Field Monitoring Team (2)**

**Description:** The field monitoring team deployed to the field without a high-range gamma survey instrument.

**Corrective Action Demonstrated:** An Eberline Model RO 20 gamma survey instrument was available **and** operable **for** use by *the* FMT should the **need** arise.

**3.2.3 61-OB-21-A-03**
**Medical Drill**

**Description:** The hospital's RRT did not adequately demonstrate decontamination of the patient. Only a minimal amount of sterile water was used ***to*** cleanse the wounds **(less** than a quart) and some of the water ended up on the floor. Injects from the controller to the RRT indicated that contamination on the patient had been reduced to background. At termination, the patient was still hying on the sheet that she had been placed on at the Cannon's **Creek** Public Boat Landing. Both ***the*** sheet and the patient still had freshly cut **grass** clippings on them from the pick up location.

**Corrective Action Demonstrated:** In the ER, the staff used appropriate monitoring, contamination control and decontamination procedures. The patients clothing and covering from the accident area were removed before the cleaning of the wound was started. The staff appropriately monitored the area and used an abundance of water to remove contamination. This was done repetitiously until the contamination was completely removed. The staff took nasal, wound, and saliva samples. The staff changed gloves frequently, dried the patient's wound before each monitoring, carefully controlled the flow ofwater and placed drapes around the injured leg wound to prevent the spread of contamination.

# APPENDIX 1

## ACRONYMS AND ABBREVIATIONS

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

| | |
|---|---|
| ANI | American Nuclear Insurers |
| ARC | American Red Cross |
| ARCA | Area Requiring Corrective Action |
| | |
| CFR | Code of Federal Regulations |
| | |
| DHEC | Department of Health and Environmental Control |
| DHHS | Department of Health and Human Services |
| 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 |
| | |
| EAS | Emergency Alert System |
| ECL | Emergency Classification Level |
| EMA | Emergency Management Agency |
| EMD | Emergency Management Division |
| EMS | Emergency Medical Services |
| EOC | Emergency Operations Center |
| EOF | Emergency Operations Facility |
| EOP | Extent-of-Play |
| EPA | Environmcntal Protection Agency |
| EMD | Emergency Management Division |
| EPZ | Emergency Planning Zone |
| ER | Emergency Room |
| ESF | Emergency Support Functions |
| ETA | Estimated Time of Arrival |
| | |
| FAA | Federal Aviation Agency |
| FCC | Federal Communications Commission |
| FDA | Food and Drug Administration |
| FEMA | Federal Emergency Management Agency |
| FEOC | Forward Emergency Operations Center |
| FMT | Field Monitoring Team |
| FR | Federal Register |

| | |
|---|---|
| FTC | Field Team Coordinator |
| GE | General Emergency |
| JIC | Joint Information Center |
| KI | Potassium Iodide |
| mR | milliroentgen |
| mR/h | milliroentgen per hour |
| NRESS | Nuclear Response and Environmental Surveillance Section |
| NRC | U.S. Nuclear Regulatory Commission |
| NUREG-0654 | NUREG-0654/FEMA-REP-1, Rev. 1, *"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980* |
| OEM | Office of Emergency Management |
| ORO | Offsite Response Organization |
| PAD | Protective Action Decision |
| PAR | Protective Action Recommendation |
| PIO | Public Information Officer |
| PRT | Planning and Response Team |
| RAC | Regional Assistance Committee |
| REP | Radiological Emergency Preparedness |
| RERP | Radiological Emergency Response Plan |
| SAE | Site Area Emergency |
| SEOC | State Emergency Operations Center |
| SOP | Standard Operating Procedure |
| STACP | State Traffic Access and Control Points |
| TCP | Traffic Control Point |
| TLD | Thermoluminescent Dosimeter |
| USCG | U.S. Coast Guard |
| USDA | U.S. Department of Agriculture |
| WP | Warning Point |

# APPENDIX 2

## EXERCISE EVALUATORS

The following is a list of the personnel who evaluated the V. C. Summer Nuclear Station exercise **on** July 23,2003. The organization represented by each is indicated by the following abbreviations:

| | |
|---|---|
| DHS/FEMA | - Department *of* Homeland Security |
| EPA | - Environmental Protection Agency |
| FDA | - Food and **Drug** Administration |
| ICF | - ICF Consulting, Incorporated |
| NRC | - Nuclear Regulatory Commission |

**Lawrence A. Robertson** **Co-RAC Chairman**

| EVALUATION SITE | EVALUATOR | ORGANIZATION |
|---|---|---|
| Eddie L. Hickman | Chief Evaluator | DHS/FEMA |
| **STATE OF SOUTH CAROLINA** | | |
| State Emergency Operations Center | Eddie Hickman<br>Bill Larrabee | DHSBEMA<br>ICF |
| Radiological Health (SEOC) | William Neidermeyer | ICF |
| Dose Assessment | Charles Phillips | ICF |
| Field Team #1<br>Field Teams #2 | Eddie Fuente<br>Robert Young | ICF<br>ICF |
| Mobile Laboratory | Neil Gaeta | ICF |
| Emergency Operations Facility | Robert Trojanowski | NRC |
| EAS Station WCOS | Dee Mauldin | DHS/FEMA |
| Joint Information Center | **Doug** Stutz | ICF |
| State Traffic Control Point | Craig Fiore | DHS/FEMA |

**FAIRFIELD COUNTY – Mike Kirkland**

| | | |
|---|---|---|
| Emergency Operations Center | Joseph Canoles<br>Lauren DeMarco<br>Stan Copeland | DHS/FEMA<br>DHS/FEMA<br>DHS/FEMA |
| Traffic Control Points<br>**(Interview at EOC)** | Lauren DeMarco | DHS/FEMA |
| Reception Center<br>**(White *Oaks* Conference Center)** | Mike Dolder | DHS/FEMA |
| Congregate Care Center<br>**(White Oaks Conference Center)** | Mike Dolder | DHS/FEMA |
| Emergency Worker Decontamination<br>**(White *Oaks* Conference Center)** | Mike Dolder | DHS/FEMA |
| Lake Clearing | Lauren DeMarco | DHS/FEMA |

**LEXINGTON COUNTY – Neil Ellis**

| | | |
|---|---|---|
| Emergency Operations Center | Tom Reynolds<br>Beth Massey<br>Tom Trout | DHS/FEMA<br>DHS/FEMA<br>**FDA** |
| Traffic Control Points (EOC) | Tom Trout | FDA |
| Reception Center | Don Cornell | DHS/FEMA |
| Emergency Worker Decontamination | Don Cornell | DHS/FEMA |

**NEWBERRY COUNTY – Tom Barber**

| | | |
|---|---|---|
| Emergency Operations Center | Robert Perdue<br>Pat Tenorio | DHS/FEMA<br>DHS/FEMA |
| Traffic Control Points (EOC) | Pat Tenorio | DHS/FEMA |
| Reception Center | Don Cornell | DHS/FEMA |
| Congregate Care Center | Don Cornell | DHS/FEMA |
| Emergency Worker Decontamination | Don Cornell | DHS/FEMA |

**RICHLAND COUNTY – Greg Sox**

| | | |
|---|---|---|
| Enicrgency Operations Center | Helen Wilgus<br>Rick Button | DHS/FEMA<br>EPA |
| Traffic Control Points (EOC) | Rick Button | EPA |
| Reception Center | Mike Dolder | DHS/FEMA |
| Emergency Worker Decontamination | Mike Dolder | DHS/FEMA |

**Out of Sequence Activities**

**FAIRFIELD COUNTY**

| | | |
|---|---|---|
| Protective Actions Schools | 5/8/03 | Eddie Hickman - DHS/FEMA |

**LEXINGTON COUNTY**

| | | |
|---|---|---|
| Protective Actions Schools | **5/8/03** | Eddie Hickman - DHS/FEMA |

**NEWBERRY COUNTY**

| | | |
|---|---|---|
| Protective Actions Schools | 5/8/03 | Eddie Hickman - DHS/FEMA |

Medical **Drill**

| | | |
|---|---|---|
| Newberry ***County*** Memorial Hospital | **5/22/03** | Robert **Perdue** - DHS/FEMA<br>Eddie Hickman - DHS/FEMA |

# APPENDIX 3

# EXERCISE CRITERIA AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise criteria, which were scheduled for demonstration in the V. C. Summer Nuclear Station exercise on July **23,2003** and the extent-of-play agreement approved by **FEMA** Region IV.

## A. Exercise Objectives

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 Region IV in preparation for the V. C. Summer Nuclear Station exercise on July **23,2003.** 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
VC Summer Nuclear Station REP Exercise
July 23, 2503

## 1. Emergency Operations Management.

### Sub-element 1.a, Mobilization

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

All state and local government personnel will be pre-positioned. Alert rosters will be provided to FEMA evaluators and a discussion of call-down procedures will be conducted.

### Sub-element 1.b, Facilities

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

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

### Sub-element 1.c, Direction and Control

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

Direction and Control will be at the State Emergency Operations Center (SEOC). County Direction and Control will take place at the Fairfield County, Lexington County, Newberry County and Richland County Emergency Operations Centers (EOC's). State Emergency Response Team (SERT) participants include the Emergency Management Division (EMD); ESF 6, Mass Care (Department of Social Services); ESF 8, Health and Medical Services (Department of Health & Environmental Control); ESF 10, Hazardous Materials, (Department of Health and Environmental Control); ESF 13, Law Enforcement (State Law Enforcement Division); and ESF 16, Emergency Traffic Management, (Department of Public Safety). A simulation cell will represent the Office of the Governor, Office of the Adjutant General, FEMA Region IV, Georgia, and *North* Carolina. 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. (MUREG-8654, F.1., 2.)

The Electronic Switch System Exchange (ESSX) is the primary means of communication to notify off-site response forces. Backup to the ESSX are commercial telephone lines, satellite telephone and the Local Government Radio (LGR).

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

Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI), and 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 MI). A 44-day supply of KI for 7000 Emergency Workers and Institutionalized individuals is stored at FNF County EOCs, and Health Departments and at DHEC headquarters in Columbia, SC. Advance rosters of emergency workers are not maintained. KI is stockpiled for the general public and may be distributed prior *to* the exercise.

All radiation defection equipment will be inspected, inventoried, and operationally checked before each use. Equipment will be calibrated or leak tested in accordance with existing plans by the South Carolina Emergency Management Division Radiological Lab.

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

## 2. Protective Action Decision Making.

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

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

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

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

Criterion 2.b.1: Appropriate protective action recommendations are based on available information on plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of on-site and off-site environmental conditions. (NUREG-0654, I.8., I0., 11. and Supplement 3.)

Protective action recornmendations 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 involving consideration of appropriate factors and necessary coordination is used to make protective action decisions (PADs) for the general public (including the recommendation for the use of KI, if ORO policy). (NUREG-0654, J.9., 1Q.M.)

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

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

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

3. Protective Action Implementation.

Sub-elemant 3.a, Implementation of Emergency Worker Exposure Control

Criterion 3.a.1: The OROs issue appropriate dosimetry 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 their 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 Dosimetry Redistribution Standard Operating Procedures, and will be discussed at the State Emergency Operations Center (SEOC). Department of Public Safety, Highway Patrol maintains and distributes 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.I: 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-06-54, E.7., J., 10.e.,f.)

KI is distributed to Emergency Workers prior to their being dispatched. KI is taken by emergency workers on order by the State Health Officer or designee. Record keeping will be discussed at risk county EOCs.

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.)

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

Criterion 3.c.2: OROs/School officials decide upon and implement protective actions for schools. (NUREG-8654, J. 10.c., d., g.)

Fairfield, Lexington, Newberry and Richland counties will simulate school evacuations by out-of-sequence interviews with key school staff members on May 8,2003.

Fairfield County school to be evaluated is McCorey-Liston Elementary School.

Lexington County school to be evaluated is Chapin High School.

Newberry County school to be evaluated is Little Mountain Elementary School.

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

Traffic and Access Control Points (TACP's) are pre-determined. The South Carolina Highway Patrol will demonstrate Traffic and Access Control on-scene at TACP 5, SC 213 and Broad River Road and TACP 1, SC 215 and New Hope Road. bake clearing operations will immediately follow TACP demonstration at Fairfield County Public Boat banding 8, Lake Menticello East; 9, Lake Monticello West; and 10, Subimpoundment Ramp.

Fairfield County TACP to be evaluated at the county EOC is TACP 4, SC 269 and US 321 South.

Lexington County TACPs to be evaluated at the county EOC are TACP 3, Old Lexington Highway and Murry bindler Road; TACP 5, Saint Peters Church Road and Westwoods Drive; and TACP 7, Meadowlark Road and Dreher Island Road.

Newberry County TACPs to be evaluated at the county EOC are TACP 1 US 176 and SC 213; and TACP 5, US 176 and SC 34.

Richland County TACPs to be evaluated at the Dutch Fork High School are TACP 3, Old Hilton Road and Three Bog Road and TACP 4, Mount Vernon Church Road and Stone Hili Road.

Criterion 3.d.2: Impediments to evacuation are identified and resolved. (NUREG-0654, J.l 0., k.)

Actions to identify and remove impediments to evacuation will be demonstrated by discussion with officers manning TCPs.

## 4. Field Measurement and Analysis.

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

Criterion **4,a.I:** 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.8., 9., 11.)

Zeolite filters will be simulated with charcoal 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, I.8., 11., J.10 a.)

Command and Control of DHEC Field Teams and mobile lab will take place at the DHEC Farrow Road Command Center, Columbia, 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 io an appropriate low background location *to* determine whether any significant (as specified by the plan and/or procedures) amount of radioactivity has **been** collected on the sampling media. (NUREG-0654, I.8., 9., 11.)

Dose Assessment will take place at the DHEC Farrow Woad Command Center, Columbia, SC.

Criterion 4.b.l: The field teams demonstrate the capability to make appropriate measurements and to collect appropriate samples (e.g., food, crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making. (NUREG-0654, I.8., J.II.)

Criterion 4.c.1: The laboratory is capable of performing required radiological analyses to support protective action decisions. (NUREG-0654, C.3., I.8., 9., J.11.)

The DHEC Mobile Lab will be located at the DHEC Farrow Woad Command Center, Columbia, SC.

## 5. Emergency Notification and Public Information

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

Criterion 5.a.l: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized off-site emergency officials to notify the public of an emergency situation. The initial instructional message *to* the public must include as a

minimum the elements required by current FEMA REP guidance. (10 CFR Part 50, Appendix E & NUREG-0654, E.1., 4., 5., 6., 7.)

The State will coordinate Protective Action Decisions (PAD) with the Chief South Caroiina county elected officials or designees. At Site Area Emergency, the siren system and the Emergency Alert System will be activated. A pre-scripted "Stay Tuned" EAS message and follow-on news release will be transmitted from the SEOC to the Local Primary (LP-1) EAS station WCOS, Columbia, S.C. A "test" EAS message will be simulated and an appropriate EAS message will be transmitted to the LP-1 station. The LP-1 station will have staff available *for* interview during the demonstration. At General Emergency, activation of the sirens and broadcast of EAS wiil be simulated.

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

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

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

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

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

## 6. Support Operations! Facilities

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

Criterion 6.a.l: 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-06.54,** J.10.h.; K.5.b.)

Reception Centers will be demonstrated out-of-sequence. At least six people will be monitored and registered. Personnel decontamination will be demonstrated via walk-through and discussion. All necessary supplies will be on-hand. Walkways will not be covered with barrier material. A monitoring productivity rate will be developed by the FEMA evaluator. 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.

Reception Centers to be evaluated are:

Fairfield County: White Oak Conference Center.
Lexington County: Crossroads Middle School Complex.
Newberry County: Newberry High School.
Richland County: Butch Fork 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)

Emergency Worker Monitoring and Decontamination will be demonstrated out of sequence. Two emergency workers will be monitored. Personnel decontamination will be demonstrated via walk-thru and discussion. One emergency vehicle will be monitored and decontaminated in accordance with local SOPs.

Emergency Worker Decontamination Points to be evaluated are:

Fairfield County: White Oak Conference Center.
Lexington County: Crossroads Middle School Complex.
Newberry County: Adult Vocational School.
Richland County: Dutch Fork High School.

**Sub-element 6.c, Temporary Care of Evacuees**

Criterion 6.c.1: Managers of congregate care facilities demonstrate that the centers have 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.)**
County shelters will be demonstrated out-of-sequence and concurrently with Evaluation Area 6.a, above. Procedures that assure that only non-contaminated persons enter shelters will be demonstrated.

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

Criterion 6.d.l: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals. (NUREG-0654, **F.2,** H.10., K.5.a.,b., L.1., **4.)**

A Medical Services Brill (MS-1) will be conducted out **of** sequence and with a separate scenario. The drill will commence at the Newberry County Recycling Center, Pomaria, SC and conclude at the Newberry County Memorial Hospital on July 22, 2003.

# 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 V. C. Summer Nuclear Station exercise on July 23, 2003.

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

# Narrative Summary

The exercise begins with VC Summer Station operating at 100% power.
It is a B2 Maintenance week.

The weather forecast for today is for the high temperature to reach 100 degrees. The wind is from the W at 276 degrees at a speed of 5 mph. A chance of severe thunderstorms is predicted for the evening.

Wateree Generating Station is off line due to maintenance. McMeekin Generating Station is offline due the construction activities with the dam. This is a peak demand day with the high temperatures, therefore the plant is in an error likely situation so the Human Performance flags are yellow.

The plant has been experiencing elevated vibration on Reactor Coolant Pump A for the past 2 days, engineering has been evaluating the high vibration on the RCP A. Also, Westinghouse has been contacted to begin evaluating the pump vibration. Pump vibrations *are* currently stable.

Valve XVG-9606-CC has a small leak coming from the packing. The rework of this valve has been added so the trip package.

RMA-3 Gas channel was taken out of service due to a failed detector during a channel operations test.

At T=-35 during the 7:30 maintenance meeting, the Plant Manager will discuss wiih Engineering, Operations and Maintenance personnel the RCP A issue and the progress on the investigation into the elevated vibration.

At T=-10 the Operations Manager will contact the on-duty Shift Supervisor and direct him to review applicable procedures, as a precautionary measure for a possible shutdown.

At T=0, a small reactor coolant system leak approximately 70 GPM occurs.
The Shift Supervisor should declare an **Alert Due to** RCS **leakage** greater **than 50 GPM**. An announcement is made to man the Emergency Response Facilities. The State and local governments will be notified within 15 minutes of the declaration. The Nuclear Regulatory Commission will be notified as soon as possible after the State and counties but within 1 hour.

At **T-35 a** medical emergency will occur in the 436 Auxiliary Building. This medical emergency will involve two plant employees. One will suffer a head injury during a fall and the second employee will suffer a fractured lower arm. See the medical section *of* the scenario package for details.

At T=75 the vibration levels begin to increase on Reactor Coolant Pump A along with pump amperage due to hearing failure. RCP A #1 seal leakage starts to increase.

At T=76 Reactor Coolant Pump A experiences a catastrophic failure resulting in the pump tearing apart. Part of the pump's impeller hits the core barrel and is driven down to the lower internals causing a loose parts monitor alarm. The Reactor Coolant Pump Thermal Barrier experiences a double ended shear resulting in a 50 GPM intersystem LOCA. A Reactor Trip occurs due to the loss of RCS A loop flow

Valve XVT-9593A-CC has Bailed to close on high flow of 65 GPM. The operating crew should attempt to close the valve. Valve XVT-9593A will fail to close when the Main Control Board switch is taken to the close position due to motor problem.

Control Room personnel should attempt to close valve MVG-9605, CCW from RB Loads, when the Main Control Board is taken to the close position, MVG-9605 will close -5% and its associated breaker will trip on thermal overload. Control Room personnel may close MVG-9606 stopping the intersystem LOCA.

At approximately T=76, the Reactor Coolant Pump A leakage increases to ~500 GPM. The Emergency Director should declare a Site Area Emergency based on a Known Loss-of-Coolant greater than Charging Pump Capacity. The State and local governments will be notified of the Site Area Emergency declaration. No Protective Action Recommendations are required at this time. The plant will request permission to activate the Alert and Notification System from the State Emergency Operations Center. V C Summer Station shall activate the sirens when the State and local government agencies direct.

At T=85 the Control Room will receive RML-2 indications warning of high radiation,

At approximately T=121, fuel damage will start to occur. Containment radiation monitors, RMG-7 and RMG-18 should increase to ~2R/hr.

At approximately T=151, Valve XVG-9606-CC will experience a large packing leak to the 436 West Penetration Area and a monitored unfiltered release will occur. The Control Room will receive an indication of the release when the Waste Processing Panel alarms. Control Room Operators should note an increase in the floor drain tank level and increased radiation level out the plant vent.

The Emergency Director should declare **a** General Emergency based on Loss **of Two of Three** Fission Product Barriers **with** Potential **Loss of the Third.** The State and **local** governments will be notified on the General Emergency declaration. Protective Action Recommendations to evacuate the two-mile radius and five mile downwind should be provided to the State and local governments **at** this time. ***(The*** PAR should ***include the evacuation of zone C-1, the EOF and News Media Area (NMA) are located in this zone. The evacuation to the EOF and NMA is Beyond the scope*** of ***this exercise and will be simulated. Credit will be given for this decision and the discussion to activate the back-up facilities.)*** The plant will request permission to activate the Alert and Notification System from the State Emergency Operations Center. V C Summer Station shall activate the sirens when the State and local government agencies direct.

At T=180 Electrical Maintenance repairs to **XVT-9605** breaker and the crew **MVG-9605** breakers terminating release.

The exercise will terminate when all objectives are met.

# Timeline

Initial Conditions

100% Power
B2 Train Maintenance **Week**
Reactor Coolant **Pump A** has been experiencing high vibration for the since July 21, 2003. Engineering has been evaluating the high vibration on RCP A. Westinghouse has been contacted **to** begin evaluating the pump vibration. The RCP **A** vibration is currently stable.

Valve XVG-9606-CC has a small leak coming from the packing. The rework of this valve has been added to the trip package.

RMA-3 Gas channel has been taken out of service due to a failed detector during calibration.

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| T=-10 | The Operations Manager will contact the on duty Shift Supervisor and direct him to review applicable procedures, for possible shutdown. |
| T=Q | **A** small reactor coolant leak approximately 70 GPM occurs. |
| T=7 | The Shift **Supervisor** should declare an **Alert** due to **Reactor** Coolant **System** exceeding **50 GPM.**<br>The SS initiates EPP-001.2 Alert checklist:<br>• Announcing the emergency to the site.<br>• Directing the Shift Communicator lo activate the beepers per EPP-002 to Notify the Emergency Response Organization.<br><br>The SS initiates EPP-002 Communication and Notification, by initiating the Emergency Notification Form to notify State **and** local Governments. |
| T=22 | Fairfield, Newberry, Richland, Lexington Counties and South Carolina State Warning Point are notified of the emergency classification. |
| T=35 | Medical Emergency is reported to the Simulator Control Room (See Medical Section of the scenario for details.) |
| T=40 | NRC notified of the event using the ENS. |
| T=55 | ERDS activated and sending plant data to the NRC. |

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| T=75 | The vibration level in RCP A begin to increase due to the bearing failure. RCP A #1 seal begins tu leak. |
| T=76 | RCP A experiences a catastrophic failure. A loose parts monitor alarm is received when the pumps impeller is driven down to the lower internals. |
| T=76 | Reactor Coolant System leakage will increase to –575 GPM total leakage. (500 GPM RCS leak, 25 GPM RCP "A" seal leakage, 50 GPM intersystem LOCA RCS to CCW) |
| T=80 | SI will occur |
| T=82 | The Emergency Director shall declare a Site Area Emergency based on a LOCA greater than Charging Pump Capacity. |
| T=84 | A site evacuation shall be announced to the plant, |
| T=85 | RML-2 will alarm indicating high radiation. |
| T=99 | Fairfield, Newberry, Richland, Lexington Counties and South Carolina State Warning Point are notified of the emergency classification hy the EOF. The plant will recommend no PARs. The communicator will request permission to activate the Emergency Warning Siren System. |
| T=113 | Accountability of plant personnel shall he complete. |
| T=121 | Fuel damage will start to causing Containment Radiation Monitors to increase. RMG-7 arid RMG-18 should increase to ~ 2 r/hr. |
| T=151 | MVG-9606, CCW from RB loads, will experience a large packing leak causing a RCS leak to the 436 West Penetration Area and a monitored, unfiltered release. Operators should note an increase in the floor drain level tank and increased radiation level outside the main plant vent. RM-A3 and RM-AB3 High Radiation Alarms received. |
| T=160 | The Emergency Director shall declare a General Emergency based on Loss of two of Three Fission Product Barriers with Potential Loss of the Third Barrier. |

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| T=170 | **Fairfield, Newbeny, Richland, Lexington Counties and South Carolina State Warning Point are** notified of **the emergency classification** by **the** EOF. **The** EOF **shall** make **Protective Action** Recommendations. *(The* **PAR** *should include the evacuation of zone C-1, the EOF and News Media Area (NMA) are located in this zone. The evacuation to the EOF and NMA is beyond the scope of this exercise and will be simulated. Credit will be given for this decision and the discussion to activate the back-up facilities.)* |
| T=180 | **Electrical Maintenance** repairs **XVG-9605-CC breaker and Control** Room **Personnel closes the valve terminating the release.** |
| **T–240** | **The exercise will be** terminated **when all objectives are demonstrated.** |