



After Action Report

(FINAL)

August 3, 2010

Radiological Emergency Preparedness Program (REPP)



Published November 3, 2010

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Administrative Handling Instructions

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Executive Summary

On August 3, 2010, the Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region IV Radiological Emergency Preparedness (REP) Program staff evaluated a plume exposure pathway exercise in the emergency planning zone (EPZ) for the Oconee Nuclear Station (ONS). ONS is located in eastern Oconee County, approximately eight miles northeast of Seneca, South Carolina and is operated by Duke Energy. The ONS EPZ is divided into 13 emergency response planning zones. The 10 mile EPZ encompasses parts of Oconee and Pickens Counties, including Clemson University in South Carolina. The population of the EPZ is approximately 73,700.

FEMA's overall objective of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency at ONS. This exercise was conducted in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans and procedures. The previous federally evaluated exercise at this site was conducted on April 1, 2008. The qualifying emergency preparedness exercise was conducted March 10 and 11, 1982.

The purpose of this report is to analyze exercise results, identify strengths to be maintained and built upon, identify potential areas for further improvement, and support development of corrective actions.

The State of South Carolina's specific objectives for the 2010 ONS REP Exercise were as follows:

- **Objective 1:** Validate state and local government emergency preparedness plans and SOPs.
- **Objective 2:** Demonstrate state and local government emergency organization's ability to protect the lives and property of citizens residing, working or traveling within the Plume Exposure Pathway Emergency Planning Zone in the event of a radiological incident at the Oconee Nuclear Station.
- **Objective 3:** Demonstrate the affected counties' ability to work effectively with ONS and the State of South Carolina under emergency conditions.
- **Objective 4:** Conduct an effective critique of each emergency response organization's performance and processes to identify strengths and weaknesses, so as to institute action to improve agency response.

The objectives developed to meet the Radiological Emergency Preparedness Program (REP) program requirements and based on the negotiated Extent of Play Agreement were as follows:

- **Objective 1:** Demonstrate the ability to provide Emergency Operations Center management including Direction and Control through the Counties' and State Emergency Operations Centers.

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- **Objective 2:** Demonstrate the ability to provide protective action decision-making for State and County emergency workers and public through exercise play and discussions of plans and procedures.
- **Objective 3:** Demonstrate the ability to physically implement protective actions for State and County emergency workers and public through exercise demonstration.
- **Objective 4:** Demonstrate the ability to activate the Prompt Alert and Notification System utilizing the PNS/EAS System through exercise play.
- **Objective 5:** Demonstrate the effectiveness of plans, policies and procedures in the Joint Information Center (JIC) for public and private sector emergency information communications.

These objectives encompass the REP Program evaluation area criteria. Except as noted below, the objectives were successfully demonstrated during this exercise. FEMA identified two areas requiring corrective action (ARCA):

1. Emergency Operations Center Management: SCEMD coordination with the risk counties and the issuance of emergency information/instructions to the public via the prompt alert and notification system was not always conducted with a sense of urgency and without undue delay.

SCEMD has reviewed their procedures and will demonstrate corrective actions during the H.B. Robinson REP Exercise on May 24, 2011.

2. Hazardous Materials Response and Decontamination: The demonstration of the monitoring of evacuees and their vehicles precluded Anderson County from monitoring the 20% of the expected number of evacuees coming to the reception center within a 12 hour period.

Anderson County is reviewing its procedures and will demonstrate corrective actions during the Oconee Full Scale REP Exercise on September 18, 2012.

FEMA has provided Areas for Improvement to the State of South Carolina under separate cover as a For Official Use Only (FOUO) document in compliance with Homeland Security Exercise and Evaluation Program (HSEEP) standards.

Section 1: Exercise Overview

1.1 Exercise Details

Exercise Name

2010 Oconee Nuclear Station Radiological Emergency Preparedness (REP) Evaluated Exercise

Type of Exercise

Full-Scale Exercise

Exercise Out of Sequence/Off Scenario Dates

July 6, July 28 and August 12, 2010

Exercise Date

August 3, 2010

Locations

See App. F for a complete listing of locations of supported exercise activities.

Sponsors

South Carolina

2779 Fish Hatchery Rd
West Columbia, South Carolina 29172

Duke Energy

526 South Church St
Charlotte, North Carolina 28202

Program

FEMA Radiological Emergency Preparedness (REP) Program

Mission

Response

Capabilities

- Emergency Operations Center Management
- Emergency Public Information and Warning
- Citizen Evacuation and Shelter in Place
- Emergency Public Safety and Security Response
- Hazardous Materials Response and Decontamination
- Triage and Pre-Hospital Treatment
- Mass Care

Scenario Type

Radiological Emergency Preparedness, Plume Phase EPZ

1.2 Exercise Planning Team Leadership

See App. G for a listing of the members of the exercise planning team leadership.

1.3 Participating Organizations

The following agencies, organizations, and units of government participated in the 2010 ONS REP Exercise.

State of South Carolina
Office of the Adjutant General, Emergency Management Division
Department of Health & Environmental Control Bureau of Land Waste Management and Health Services
Department of Natural Resources, Law Enforcement
Department of Public Safety, Highway Patrol, and Bureau of Public Safety
Department of Social Services
Clemson University (liaison to Pickens County)
Risk Jurisdictions
Oconee County, South Carolina
<ul style="list-style-type: none"> • Emergency Services • Sheriff's Office • School District • Transportation • Public Works • Seneca Police Department
Pickens County, South Carolina
<ul style="list-style-type: none"> • Emergency Management Agency • Emergency Medical Services • Sheriff's Office • School District • Transportation • Public Works
Host Jurisdictions
Anderson County, South Carolina
<ul style="list-style-type: none"> • Sheriff's Office • Hazardous Materials Team • City of Anderson Police and Fire Departments • City of Belton Emergency Medical Services
Greenville County, South Carolina
<ul style="list-style-type: none"> • Sheriff's Office • Berea Public Service • Berea Fire Department • Wade Hampton Fire Department

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Non-Governmental Organizations
Amateur Radio Emergency Services (ARES)/Radio Amateur Civil Emergency Services (RACES)
American Red Cross (ARC), Upstate Chapter
Cannon Memorial Hospital
Oconee Medical Center
The Salvation Army
Federal Organizations
Nuclear Regulatory Commission

Section 2: Exercise Design Summary

2.1 Exercise Purpose and Design

DHS/FEMA administers the Radiological Emergency Preparedness (REP) Program pursuant to the regulations found in 44 CFR 350, 351 and 352. 44 CFR 350 codifies 16 planning standards that form the basis for radiological emergency response planning for licensee, State, tribal and local governments impacted by the emergency planning zones established for each nuclear power plant site in the United States. 44 CFR 350 sets forth the mechanisms for the formal review and approval of State, Tribal and local government radiological emergency response plans and procedures by DHS/FEMA. One of the REP program cornerstones established by these regulations is the biennial exercise of offsite response capabilities. During these exercises State, Tribal and local governments demonstrate their abilities to implement their plans and procedures to protect the health and safety of the public in the event of a radiological emergency at the nuclear plant.

The results of this exercise together with review of the radiological emergency response plans and procedures and verification of the periodic requirements set forth in NUREG-0654/FEMA-REP-1 through the Annual Letter of Certification and staff assistance visits enables FEMA to provide a statement with the transmission of this final After Action Report to the NRC that State, Tribal and local plans and preparedness are; (1) adequate to protect the health and safety of the public living in the vicinity of the nuclear power facility by providing reasonable assurance that appropriate protective measures can be taken offsite in the event of a radiological emergency, and (2) capable of being implemented.

Formal submission of the RERPs for ONS to FEMA by the State of South Carolina occurred on May 7, 1982. Formal approval of the State of South Carolina's RERP was granted on February 23, 1982, under 44 CFR 350.

A REP exercise was evaluated on August 3, 2010, and included evaluations of the following out of sequence activities held on July 6 through August 12, 2010, consisting of the following:

- Oconee County: Emergency Worker Decontamination, August 2, 2010.
- Pickens County: Emergency Worker Decontamination, July 6; Protective Actions for Schools, July 28; Medical Services Drill with Cannon Memorial Hospital, August 12, 2010.
- Anderson County: Reception and Congregate Care Center, August 2, 2010.
- Greenville County: Reception and Congregate Care Centers, August 3, 2010.

2.2 FEMA Exercise Objectives and Capabilities

Capabilities-based planning allows for exercise planning teams to develop exercise objectives and observe exercise outcomes through a framework of specific action items that were derived from the Target Capabilities List (TCL). The capabilities listed below form the foundation for the organization of all FEMA Region IV REP Program objectives and observations in this exercise.

- **Emergency Operations Center (EOC) Management:** Is the capability to provide multi-agency coordination (MAC) for incident management by activating and operating an EOC for a pre-planned or no-notice event. EOC management includes EOC activation, notification, staffing, and deactivation; management, direction, control, and coordination of response and recovery activities; coordination of efforts among neighboring governments at each level and among local, regional, State, and Federal EOCs; coordination public information and warning; and maintenance of the information and communication necessary for coordinating response and recovery activities.
- **Emergency Public Information and Warning:** Is the capability that includes public information, alert/warning and notification. It involves developing, coordinating, and disseminating information to the public, coordinating officials, and incident management and responders across all jurisdictions and disciplines effectively under all hazard conditions.
- **Citizen Evacuation and Shelter in Place:** Is the capability to prepare for, ensure communication of, and immediately execute the safe and effective sheltering-in-place of an at-risk population (and companion animals), and/or the organized and managed evacuation of the at-risk population (and companion animals) to areas of safe refuge in response to a potentially or actually dangerous environment. In addition, this capability involves the safe reentry of the population where feasible.
- **Emergency Public Safety and Security Response:** Is the capability to reduce the impact and consequences of an incident or major event by securing the affected area, including crime/incident scene preservation issues as appropriate, safely diverting the public from hazards, providing security support to other response operations and properties, and sustaining operations from response through recovery. Public Safety and Security Response requires coordination among officials from law enforcement (LE), fire, and emergency medical services (EMS).
- **Hazardous Materials Response and Decontamination:** Is the capability to assess and manage the consequences of a hazardous materials release, either accidental or as part of a terrorist attack. It includes testing and identifying all likely hazardous substances onsite; ensuring that responders have protective clothing and equipment; conducting rescue operations to remove affected victims from the hazardous environment; conducting geographical survey searches of suspected sources or contamination spreads and establishing isolation perimeters; mitigating the effects of hazardous materials, decontaminating on-site victims, responders, and equipment; coordinating off-site decontamination with relevant agencies, and notifying environmental, health, and law enforcement agencies having jurisdiction for the incident to begin implementation of their standard evidence collection and investigation procedures.
- **Triage and Pre-Hospital Treatment:** Is the capability to appropriately dispatch emergency medical service (EMS) resources; to provide feasible, suitable, and medically

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acceptable pre-hospital triage and treatment of patients; to provide transport as well as medical care en-route to an appropriate receiving facility; and to track patients to a treatment facility.

- **Mass Care:** Is the capability to provide immediate shelter, feeding centers, basic first aid, bulk distribution of needed items, and related services to persons affected by a large-scale incident, including special needs populations. Special needs populations include individuals with physical or mental disabilities who require medical attention or personal care beyond basic first aid. Other special-needs populations include non-English speaking populations that may need to have information presented in other languages. The mass care capability also provides for pet care/handling through local government and appropriate animal-related organizations. Mass care is usually performed by nongovernmental organizations (NGOs), such as the American Red Cross, or by local government-sponsored volunteer efforts, such as Citizen Corps. Special-needs populations are generally the responsibility of local government, with medical needs addressed by the medical community and/or its alternate care facilities. State and Federal entities also play a role in public and environmental health by ensuring safe conditions, safe food, potable water, sanitation, clean air, etc.

Additionally, each capability is linked to several corresponding activities and tasks to provide additional detail. Based upon the identified exercise objectives, the following capabilities and associated activities are:

- **Objective 1:** Demonstrate the ability to provide EOC management including direction and control through the Counties and State EOC Multi-agency Coordination Center System (MACCS).
 - **Capability: EOC Management** - Activate EOC/MACC/IOF; Direct EOC/MACC/IOF Tactical Operations; and Provide EOC/MACC/IOF Connectivity
- **Objective 2:** Demonstrate the ability to provide protective action decision-making for State and County emergency workers and public through exercise play and discussions of plans and procedures.
 - **Capability: EOC Management** - Gather and Provide Information; Identify and Address Issues; and Support and Coordinate Response
 - **Capability: Emergency Public Information and Warning** - Manage Emergency Public Information and Warnings; Activate Emergency Public Information, Alert/Warning, and Notification Plans and Issue Emergency Warnings
- **Objective 3:** Demonstrate the ability to physically implement protective actions for State and Counties' emergency workers and public through exercise demonstration.
 - **Capability: EOC Management** - Direct EOC Tactical Operations; Gather

- and Provide Information; and Identify and Address Issues
- **Capability: Emergency Public Safety and Security Response** - Activate Public Safety and Security Response; Control Traffic, Crowd, and Scene; and Command and Control Public Safety and Security Response Operations
 - **Capability: Citizen Evacuation and Shelter-in-Place** - Direct Evacuation and/or In-Place Protection Operations; Activate Evacuation and/or In-Place Protection; Implement Evacuation Orders for General Population; Collect and Evacuate Population Requiring Assistance
 - **Capability: Hazardous Materials Response and Decontamination** – Direct Hazardous Material Response and Decontamination Tactical Operations; Activate Hazardous Material Response and Decontamination; Assess Hazard and Evaluate Risk; and Conduct Decontamination and Clean-up /Recovery Operations
 - **Capability: Mass Care (Sheltering, Feeding, Related Services)** - Establish Shelter Operations and Shelter General Population.
 - **Capability: Triage and Pre-Hospital Treatment** - Direct Triage and Pre-Hospital Treatment Operations; Activate Triage and Pre-Hospital Treatment; Transport; and Provide Treatment
- **Objective 4:** Demonstrate the ability to activate the Prompt Alert and Notification System utilizing the PNS/EAS System through exercise play.
 - **Capability: Emergency Public Information and Warning** - Manage Emergency Public Information and Warnings; Activate Emergency Public Information, Alert/Warning, and Notification Plans; and Issue Public Information, Alerts/Warnings, and Notifications.
 - **Objective 5:** Demonstrate the effectiveness of plans, policies and procedures in the Joint Information Center (JIC) for joint (public and private sectors) emergency information communications.
 - **Capability: Emergency Public Information and Warning** - Establish Joint Information Center; Conduct Joint Information Center Operations; Issue Public Information, Alerts/Warnings, and Notifications; Conduct Media Relations; and Provide Public Rumor Control.

2.3 Scenario Summary

The exercise began with Oconee Unit I at 100% power. The reactor core is at 492 Effective Full Power Days (end of core life) with Group 8 rods fully withdrawn. Oconee Units 2 and 3 are also at 100%power. Keowee Hydro Units I and 2 are available as an emergency power supply through both the overhead and underground paths. Both Lee combustion turbines are also available to supply emergency power.

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The weather forecast for Tuesday, August 3rd, has winds from the North (343°) with a wind speed of 5 to 10 miles per hour (7 mph average). A low temperature of 72° is expected with a high temperature of 90°.

At 0730 Maintenance personnel enter the Unit I Containment Building to investigate high vibration readings on the A Reactor Building Cooling Unit (RBCU). Upon closing the inner hatch door, the keyway key on the door's hand wheel drops out and falls between the personnel hatch and the reactor building floor. The maintenance technicians spend the next 30 minutes attempting to locate the key; however, they are unable to retrieve it. At 0812 the site experiences a design basis earthquake ("J. 08g"; "S. 6 Richter Scale). This results in Stat Alarm I SA -9, E-I (Seismic Trigger Actuators) being received along with several emergency line calls reporting buildings and the ground trembling. This condition satisfies the requirement for an Alert emergency classification. The Operations Shift Manager initiates Emergency Plan using RP/O/B/IOOO/OI, Emergency Classification.

After reviewing the Emergency Classification Procedure, the Operations Shift Manager (OSM) declares an Alert at 0817 based on EAL 4.7.A.1 - *Tremor Felt and Seismic Trigger Alarm Actuators (0.05g)*. Procedure actions are initiated to: notify offsite agencies (SC State, Oconee County, Pickens County, and the NRC); activate the site's Emergency Response Organization (ERO); initiate Site Assembly; and, activate the Emergency Response Data System (ERDS). The SC State Warning Point, Oconee County LEC, Oconee County EMD, Pickens County LEC, and Pickens County EMD are notified of the Alert at 0827 (or within 15 minutes after the declaration).

Site Assembly is completed at 0850-0900 (or within 30 minutes after initiation) and the TSC and OSC are staffed and *Operational*. The OSM and TSC Emergency Coordinator begin turnover. The TSC is activated at 0910 (no later than 75 minutes of the Alert declaration). The TSC is now responsible for Emergency Classification, Offsite Notifications, and Protective Action Recommendations. Site emergency response personnel are monitoring plant conditions and implementing appropriate response actions. Field Monitoring Teams are surveying the site and downwind environs to determine if there is any radioactivity being released as a result of this event. No increase in radioactivity above background is detected at this time.

Minimum staffing at the EOF is completed by 0910 (within 75 minutes of the Alert declaration) and the EOF is declared *Operational* at this time. The Turnover process between TSC and EOF positions is scheduled to begin following completing of the follow up Emergency Notification Form for the Alert declaration.

At 0933 a Large Break LOCA occurs. Fuel clad damage occurs as a result of the rapid depressurization. At 0949 the TSC Emergency Coordinator declares a Site Area Emergency based on EAL 4.1.S.1, *Loss of Any Two Barriers*. No Protective Action Recommendations are required at this time. Notification of the Site Area Emergency classification is provided to SC State EOC, Oconee County EOC, and Pickens County EOC within 15 minutes of the event classification. Oconee and Pickens County coordinate activation of the Alert and Notification System (EAS and Sirens) with SC State. EAS and Sirens activation simulated within 15 minutes of the decision by State and County Emergency Management Directors to activate the Alert and

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Notification System. As part of this exercise, one siren failure will be simulated as having occurred for each county.

At 1015, (or after turnover is completed) the EOF is Activated. The EOF is now responsible for Emergency Classification, Offsite Notifications, and Protective Action Recommendations.

At 1050 the seals on the Emergency Personnel Hatch fail. Steam is immediately observed and reported to the TSC. A rapid decrease in Reactor Building pressure is observed. This condition satisfies the requirement for a General Emergency classification. The EOF Director declares a General Emergency at 1105 based on EAL 4.1.G.2, *Loss of All Three Barriers*. Protective Action Recommendation to evacuate two miles radius, five miles downwind, and shelter all remaining sectors is provided to SC State by the EOF Director (this is the minimum PAR required by plant conditions). If a Dose Assessment has been completed, then a recommendation is made to issue KI to the public. The PAR is as follows:

Evacuate:	Oconee County - AO, DI Pickens County - AO, B I, C I
Shelter:	Oconee County - E I, F I, D2, E2, F2 Pickens County - AI, A2, B2, C2

The SC State EOC, Oconee County EOC, and Pickens County EOC are notified of the General Emergency classification and Protective Action Recommendations at 1120 (or within 15 minutes of the event classification). After reviewing the site's Protective Action Recommendations and current plant conditions, SC State along with Oconee and Pickens Counties determine the Protective Action Recommendations that will be issued. Within 15 minutes of this determination, state and county personnel begin to implement the agreed on Protective Actions. The Alert and Notification System is activated (simulated unless required due to problems at the Site Area Emergency classification).

Site Evacuation (simulated) of non-essential personnel is initiated by 1130 if it was not performed earlier. RP personnel prepare an evacuation plan that sends personnel to Keowee Elementary School due to the fact that a radiological release is in progress. Oconee and Pickens County personnel may be requested to support the site evacuation. The OSC may be required to arrange for transportation of affected personnel. NOTE: If Site Evacuation is initiated prior to the radiological release start, then affected personnel may be evacuated to their personnel residence. The exercise is terminated no later than 1300 once the state and counties complete demonstration of applicable objectives.

Section 3: Analysis of Capabilities

3.1 Exercise Evaluation and Results

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities that participated in the August 3, 2010 plume exercise and OOS interviews and demonstrations of July 6 thru August 12, 2010.

3.2 Evaluation Summaries

3.2.1 State Of South Carolina

3.2.1.1 State Emergency Operations Center

Emergency Operations Center Management Capability Summary:

This capability was demonstrated at the South Carolina State Emergency Operations Center (SEOC) located in West Columbia, SC. The State Warning Point (SWP), collocated with the SEOC, demonstrated the ability to receive emergency notifications and alert personnel to staff the SEOC. The SEOC staff included the Department of Health and Environmental Control (DHEC), Division of Social Services (DSS) South Carolina Highway Patrol (SCHP) and the South Carolina Emergency Management Division (SCEMD). Other agencies working in conjunction with the SEOC were the Department of Public Safety and South Carolina Bureau of Public Safety.

The SEOC Chief of Plans (CP) was delegated the authority to direct and coordinate the State response to the event at ONS. The Chief of Operations (CO) was deployed forward and maintained situational awareness throughout the exercise via telephone with the CP. The CP briefed SEOC staff whenever there were any changes in emergency classification levels (ECL) or any significant changes in conditions. The CP coordinated protective action decisions (PADs) with Oconee and Pickens Counties, and kept the Duke Emergency Operations Facility (EOF) informed. The CP used participating state agencies to provide pertinent information in the formulation and implementation of the PADS.

Area Requiring Corrective Action

Activity: Support and Coordinate Response: Coordinate emergency management efforts among local, county, regional, State, and Federal EOC/MACC/IOF.

Observation: Coordination and issuance of emergency information/instructions to the public via the prompt alert and notification system was not always conducted with a sense of urgency and without undue delay.

References:

1. Planning Standard E.6 and Appendix 3 of NUREG-0654 FEMA-REP-1, Rev. 1, dated October 1980
2. Attachment B to South Carolina Operational Radiological Emergency Response Plan (SCORERP), dated August 2009
3. Annex 1 Basic Plan, Appendix 2, dated August 2009

Analysis:

The SEOC received the notification of a Site Area Emergency at 0956. Attachment B of the SCOREP states that an expected State action is to “Coordinate activation of public alert system and EAS in 10-mile EPZ so residents will turn on radios/televisions. Provide public with periodic updates.” The coordination/decision making process took over an hour from the receipt of the SAE declaration to the initiation of the broadcast of the “Stay Tuned” EAS message at 1100. However, at the same time that the “Stay Tuned” EAS message was being broadcast, Oconee County issued a news release stating that A-0 was being evacuated and zones B-1, C-1 and D-1 were being asked to shelter-in-place.

At 1024 the sequence of events included a protective action recommendation (PAR) in an update to the Site Area Emergency from Duke Energy. The State’s coordinated decision to follow the recommended protective action was made at 1106. The EAS message concerning this decision was not broadcast until 1120.

The overlap of these actions and the potential for public confusion could be avoided by a greater sense of urgency at the SEOC to coordinate decisions and activate the prompt alert and notification system.

Recommendation: Review and revise plans and procedures, as necessary, regarding the receipt of ENFs and modify the coordination/decision making process. A single call between State and county decision makers could improve the process.

Corrective Actions: SCEMD will demonstrate corrective actions taken during the H.B. Robinson REP Exercise on May 24, 2010. SCEMD will establish a bridge line conference call capability for Decision Line discussions/decision making. SCEMD will ensure that the SEOC and all four counties are tied into the line. The speaker phone in the Governor’s Situation Room will be utilized so that all parties, state and counties, may be privy to decision making discussions as they take place in a unified setting.

By having all parties on the decision line call simultaneously, the time between discussions/decision making by the SEOC Executive Group should be eliminated. Recommendations will be relayed to the counties for additional discussion and final decision, resulting in a substantial time saving opportunity.

For this capability the following criteria were met: 1.a.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, and 5.a.1

Emergency Public Information and Warning

SCEMD demonstrated the capability to notify and warn the public of a simulated emergency at ONS, by coordinating (via conference call) with Oconee and Pickens Counties, other agencies in the State of South Carolina and the Utility. The SEOC Public Information Officer (PIO) was responsible for developing EAS message information and press releases. The PIO insured that the CP reviewed and approved all EAS messages and news releases before transmitting the information to the appropriate entity.

Four Emergency Alert System (EAS) messages and seven news releases were generated, approved and disseminated. Additionally, SCEMD issued news releases to the media and simulated their placement on the SCEMD website, which would provide additional emergency information for the public.

For this capability the following criteria were met: 5.b.1.

3.2.1.2 SC Dose Assessment

Hazardous Materials Response and Decontamination Capability Summary:

The dose assessment staff of the South Carolina Department of Health and Environmental Control (DHEC) demonstrated the part of this capability dealing with the ability to assess and manage the consequences of a hazardous material (radiological) release. The staff employed a dose assessment program as specified in their plans to independently verify dose projections made by the licensee. Based on the dose projections of both the licensee and their own dose projections, the dose assessment staff made protective action recommendations to DHEC's Emergency Response Coordinator (ERC). The ERC provided the PARs to the State's decision makers who made the final PAD.

For this capability the following criteria were met: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 2.b.2 and 4.a.2.

3.2.1.3 State Traffic Control Points

Emergency Public Safety and Security Response Capability Summary:

The South Carolina Highway Patrol (SCHP) was activated and mobilized to the traffic control points (TCP) in a timely manner. They were provided appropriate equipment, supplies, and

instructions to conduct their mission in a safe and efficient manner. The Post B command post/staging area was capable of providing the TCPs with accurate and timely emergency information as it is relayed from the SCHP supervisor at the EOC. The Troopers conducting traffic and access control were knowledgeable of their responsibilities pertaining to directing traffic out of the affected areas, the clearing of impediments and informing evacuees of shelters and evacuation routes. They were also competent in the use of their personal exposure control equipment and limits.

For this capability the following criteria were met: 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1 and 3.d.2.

3.2.1.4 State Waterway Warning

Emergency Public Safety and Security Response Capability Summary:

The South Carolina Department of Natural Resources (SCDNR) Officer was alerted and responded to the boat launch in a timely manner. He was provided appropriate equipment, supplies, and instructions to conduct the waterway warning mission in a safe and effective manner. The SCDNR supervisor, located in the Pickens County EOC, was capable of providing the officers with accurate and timely emergency information updates. The SCDNR Officer interviewed was knowledgeable of his responsibilities pertaining to the clearing of the waterways and providing relevant safety information to boaters. He was also competent in the use of personal exposure control equipment and limits.

For this capability the following criteria were met: 1.d.1, 1.e.1, 3.a.1, 3.b.1 and 5.a.3.

3.2.1.5 Emergency Alert Station

Emergency Public Information and Warning:

The Local Primary (LP-1) radio station for ONS is WFBC (93.7 FM). The station's staff and management successfully demonstrated the process of receipt, verification and transmission of an EAS message. The EAS message was received by facsimile from the SEOC and verified by using a code word system prior to release to the public. The LP-1 station broadcast area encompassed the 10 mile EPZ of ONS. The LP-1 station is staffed 24 hours a day, 7 days a week. In the event of a power failure, backup generators were available at the station. The LP-1 staff was well trained and knowledgeable in their duties as they relate to the EAS process.

For this capability the following criteria were met: 1.d.1, 1.e.1 and 5.a.1.

3.2.2 Joint Operations

3.2.2.1 Emergency Operations Facility

Emergency Operations Center Management Capability Summary:

Officials from DHEC and SCEMD were dispatched to the utility operator's Emergency Operations Facility (EOF), and served in a liaison capacity between the utility operator and the SEOC. Communications and coordination between the state agencies, the utility operator and the NRC were outstanding. All activities were based on the plans and procedures and completed as they would have been in an actual emergency except as noted in the extent of play agreement.

For this capability the following criterion were met: 2.b.1.

3.2.2.2 Joint Information Center

Emergency Public Information and Warning Capability Summary:

The State of South Carolina and risk jurisdictions (Oconee and Pickens Counties) demonstrated this capability during activities at the SEOC, the Joint Information Center (JIC), and in the respective county EOCs. While the preponderance of observations was made at the JIC, aspects derived from the JIC's interface with the SEOC and risk EOCs has been included.

The JIC was staffed for this exercise by Duke Power Company employees, the SC Public Information Response Group (SCEMD and DHEC representatives), and representatives of the risk counties and Clemson University. The JIC activation commenced after the utility's declaration of Alert ECL. For the purpose of this exercise State personnel were staged in the Clemson area and relocated to the JIC after receiving notification that Alert had been declared. Upon arrival of all government jurisdiction representatives, the Duke JIC Manager declared the JIC activated.

Prior to State and local representatives' arrival, the Duke spokesperson provided an initial update to the media regarding the Alert. In the remaining 3 hours and 20 minutes of exercise play following activation, the JIC conducted three media briefs that ensured the actions being taken by the State and counties to safeguard the public were well publicized. State and county representatives provided detailed descriptions of evacuation zones, locations of shelters and reception centers, evacuation routes, and recommended actions for evacuees. In addition, they provided guidance to farmers pertaining to safeguarding livestock. The State and each county provided telephone numbers citizens could use to obtain information and/or clarify rumors. The JIC also disseminated emergency information messages designed to provide supplemental information supporting EAS message broadcasts. The emergency information messages were prepared and approved at the State and were disseminated to media representatives at the JIC. Duke Energy also established a corporate media center (CMC) in Charlotte; which was where Duke Energy prepared its media releases.

Media monitoring was simulated during this exercise. Information lines over which the public could make inquiries were staffed by the State in the JIC, by county personnel in the Oconee and Pickens Counties' EOCs, and by Duke Energy at their CMC. The State rumor control representative discussed each call with the State PIO; clarification of issues surfaced in calls made to the CMC was made through coordination over WebEOC.

For this capability the following criteria were met: 1.a.1, 1.c.1, 1.d.1, 1.e.1 and 5.b.1.

3.2.3 Risk Jurisdictions

3.2.3.1 Oconee County, South Carolina

3.2.3.1.1 Emergency Operations Center

Emergency Operations Center Management Capability Summary:

Oconee County successfully demonstrated the ability to activate, alert and mobilize emergency personnel in a timely manner. The EOC provided sufficient space, equipment and displays to support the operation. The Deputy Emergency Manager (EM) demonstrated good direction and control of the EOC at all times. He provided informative briefings and solicited staff input at regular intervals. The County Director of Emergency Services was the Incident Commander and coordinated PADs with County Officials, SEOC, and Pickens County officials. PADs for the special needs populations, including schools were discussed and coordinated within the EOC. Appropriate dosimetry and radiological exposure control procedures for emergency workers and EOC staff was observed. The EOC's communications equipment was sufficient to support the operation. The traffic control plan was coordinated with and successfully demonstrated by the SCHP.

For this capability the following criteria were met: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.c.2, 3.d.1, 3.d.2 and 5.a.1.

Emergency Public Information and Warning Capability Summary:

Oconee County emergency management staff successfully demonstrated the ability to develop, coordinate and release public information. Two responders were assigned as PIOs and maintained the position throughout the exercise. Information was compiled as it was obtained; the EM distributed all incoming information to the PIO for compilation. As soon as the JIC was activated all public information was released through that venue. The EM coordinated all EAS messages with the SEOC and Pickens County. All county specific public information was complete, accurate and released in a timely manner.

For this capability the following criteria were met: 5.a.1 and 5.b.1.

3.2.3.1.2 Protective Actions for Schools

Citizen Evacuation and Shelter in Place:

Oconee County emergency management staff successfully demonstrated the ability to implement protective measures for students and staff of schools located within the 10-mile EPZ. The capability was demonstrated through an out-of-sequence interview of principals of each of the following schools: Code Academy, James Brown Elementary, Keowee Elementary, Ravenel Elementary and Tamasee-Salem Middle-High School. Also present for interviews were the School District's Director of Emergency Services, the Transportation Supervisor and a Deputy

from the Oconee County Sheriff's Office.

The Transportation Supervisor and two of the principals were present were licensed bus drivers and undertook that role for the purpose of discussion. The District's Director of Emergency Services is represented in the Oconee County EOC upon activation. All participants had current plans and described the actions they would take to protect the staff and students. The actions they described were in compliance with the plans. The school system possesses sufficient resources to complete a safe and effective relocation of students and staff to a pre-determined area. District staff also demonstrated the ability to assure that any such relocation would be communicated to parents in a timely manner through the use of an electronic message system.

For this capability the following criteria was met: 3.c.2.

3.2.3.1.3 Backup Route Alerting

Emergency Public Safety and Security Response:

Each emergency worker involved in backup route alerting successfully demonstrated their duties in accordance with county plans and procedures. The primary method of alerting the public in Oconee County is through activation of a siren system. Backup route alerting is used when siren failure(s) are identified. The 911 Communications Center performed a silent test of all sirens at 1055 and the system reported all sirens were operational with no failures. To meet the requirements of the extent of play agreement concerning route alerting, siren number 32 was simulated as an activation failure. Backup route alerting of siren 32 coverage areas was demonstrated by Oconee County Fire Rescue. Fire Rescue emergency workers received a radiological safety briefing, dosimetry, KI and route assignments. The coverage area was divided into three sectors and a Fire Rescue emergency worker was assigned to each sector. The broadcasting of a pre-scripted message every one quarter mile was simulated and the process can be completed in a timely manner.

For this capability the following criteria were met: 3.a.1 and 5.a.3.

3.2.3.1.4 Emergency Worker and Vehicle Decontamination

Hazardous Materials Response and Decontamination Capability Summary:

Oconee County emergency management staff effectively demonstrated the ability to monitor and decontaminate emergency workers and vehicles, during out-of sequence activities. The Emergency Worker Decontamination (EWD) was supported by the Oconee County Hazardous Materials (HAZMAT) Team and Oconee County Emergency Management. The Oconee HAZMAT Team's Radiological Officer gave a safety and radiological briefing to the entire monitoring and decontamination team. He also reminded each worker as they were issued their dosimetry of their exposure limits, KI requirements, and time requirements for reading and reporting their Direct Read Dosimeter (DRD) results. The monitoring and decontamination team exhibited excellent team work, communications, cross contamination prevention procedures and

monitoring and decontamination practices. By talking through different scenarios and demonstrating the actions that would be required if new or different actions were taken the team developed new capabilities and processes for handling future activities.

For this capability the following criteria were met: 1.e.1, 3.a.1, 6.a.1 and 6.b.1.

3.2.3.2 Pickens County, South Carolina

3.2.3.2.1 Emergency Operations Center

Emergency Operations Center Management Capability Summary:

The Emergency Management Director (EMD) was notified of the initial call from the ONS and initiated the EOC activation process. The EOC callout was completed in an expeditious manner and all support agencies and elected officials were notified.

The EMD exhibited good direction and control throughout the exercise. He maintained an ongoing briefing with the EOC staff and insured that all agencies were up to date with current information. He kept the EOC staff looking forward and preparing for potential situations and taking precautionary actions. The EMD used his Assistant to monitor the DL to obtain information from the State and other counties, and to concur on PADS.

Information from WebEOC, the ONS liaison, DHEC, and the State was used in making PADS and precautionary actions. The EMD used a dedicated staff member to enter information into WebEOC and to track a decision matrix to insure actions were being completed in an orderly manner.

As information became available the EMD had support agencies prepare to take actions. School Officials, Sheriff's Office, transportation personnel and County engineers conferred to address possible alterations to traffic patterns due to the reported seismic activity.

The EMD and School Officials agreed to relocate all schools in the 10-mile EPZ but to concentrate on schools closer to ONS first. The radiological officer kept the EMD informed on dosimetry and radiological equipment and the need to initiate the State dosimetry re-distribution plan. DHEC and the radiological officer tracked emergency workers' exposures and were very knowledgeable of exposure limits and action levels. When an area DRD indicated an increased dose reading the EMD had all agencies review plans to relocate to the alternate EOC if conditions deteriorated. DHEC and the radiological office placed additional DRDs in locations to better track any problems.

All PADS were coordinated with the State and Oconee County. The EMD made sure all counties and agencies were informed when the decision to relocate schools, special needs individuals, and the general public was made.

For this capability the following criteria were met: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.c.2, 3.d.1, 3.d.2 and 5.a.1.

Emergency Public Information and Warning Capability Summary:

The County EMD had the primary responsibility for alert and notification of the public. This was successfully demonstrated in a timely manner. Primary alert and notification methods for the county were a siren alert system which consisted of 28 outdoor sirens located strategically throughout the 10-mile EPZ in Pickens County in conjunction with the EAS messages transmitted from the LP-1 Radio Station. Both siren activations and EAS messages were carried out through coordination with Oconee County and input from the State of South Carolina. During the siren activation, siren number 48 had a simulated failure and a pre-designated team was dispatched to conduct door to door alerting per county plans and procedures.

A copy of the EAS message sent from the State of South Carolina to the LP-1 was faxed to Pickens County along with several follow-up press releases issued by the State of South Carolina following the siren activations. Each EAS message and subsequent follow-up messages contained all necessary elements and information as required.

The Pickens County Senior PIO was responsible for providing timely coordination and dissemination of messages for the county. Two County PIO Assistants were dispatched to the JIC to coordinate with the utility, Federal and State spokespersons. This facilitated the exchange of information between the JIC and the county.

The County PIO coordinated and validated all messages concerning Pickens County with approval from the EMD prior to forwarding to the JIC for public release. The EMD received authority to validate messages from the Chairman of the County Council, who was not present for the exercise. Should the JIC or SEOC not be operational, Pickens County would make news releases through the media and the EAS.

Although Pickens County established rumor control staff, no rumor control calls were received during the exercise. Throughout the exercise all County PIO personnel kept each other briefed and current on new information as it became available.

For this capability the following criteria were met: 5.a.1 and 5.b.1.

3.2.3.2.2 Protective Actions for Schools

Citizen Evacuation and Shelter in Place:

During this demonstration this capability was restricted to the implementation of protective measures for schools within the 10-mile EPZ. It was demonstrated during interviews in which the principals of two at risk schools (D.W. Daniel High School and R.C. Edwards Middle School) of the Pickens County School District. Representatives from the school district, the County's emergency management agency and Sheriff's Office also participated. The interviews pointed out that there is close coordination between county agencies and schools and that plans and procedures at each level were compatible, consistent and practical. Processes which were discussed included training for staff and faculty; individual and collective responsibilities;

coordination with and notification of the parents; availability of resources to relocate students; and the variables that could affect the decision-making process by the school district's superintendent and principals. A similar but separate interview with representatives of Clemson University was also conducted. This aspect of the capability was sufficiently demonstrated to indicate the county, school district and Clemson University were prepared to safeguard students, staff and faculty of the at risk schools in the event of an incident at ONS.

For this capability the following criterion were met: 3.c.2.

3.2.3.2.3 Backup Route Alerting

Emergency Public Safety and Security Response:

Backup route alerting following a siren failure was evaluated through an interview in the Pickens County EOC. At 1055 the EOC activated the siren system (simulated). A controller inject denoted that siren #48 had failed to activate. Once notified, the Rescue Coordinator indicated that he would dispatch Pickens Rescue Squad #6 to the area where the failure occurred. The Rescue Coordinator produced a siren coverage map showing the routes to be covered. Ten vehicles with 2 squad members per vehicle would be dispatched. Each team had the coverage maps and would meet up and divide the area into manageable routes. The teams would have been given 0-5 R dosimeters, permanent record dosimeters (PRDs), Potassium Iodide (KI), and emergency worker instructions on their use. The instructions included call back and turn back limits and detailed information on KI. Each team would read over a public address loudspeaker a message based on the PAD at the time. Once the teams completed their route they would meet at a predetermined location and inform the EOC of route completion by radio. The Rescue Coordinator estimated that the routes in this particular siren coverage area could be covered in less than 45 minutes.

For this capability the following criteria were met: 3.a.1 and 5.a.3.

3.2.3.2.4 Emergency Worker and Vehicle Decontamination

Hazardous Materials Response and Decontamination Capability Summary:

Radiological monitoring and subsequent decontamination of emergency workers, their vehicles and equipment were successfully demonstrated by Pickens County Radiological Protection Service, specifically members of the Pickens County Volunteer Hazardous Materials Emergency Response Team. The Radiation Officer conducted a safety briefing covering personal dosimetry, operation of DRDs, how often to read the DRDs, state action levels, and how to respond and report reading results. The briefing also included when to use KI, and its associated precautions.

The vehicle, equipment and personnel monitoring and decontamination teams displayed excellent monitoring techniques and knowledge of the contamination limits set by the state action levels. When contamination exceeding state action levels was found, the teams were both knowledgeable and well trained in the proper decontamination techniques and procedures to use.

The resources, facilities, equipment and written plans and procedures were more than adequate to perform the county mission of Emergency Worker Monitoring and Decontamination.

For this capability the following criteria were met: 1.e.1, 3.a.1, 6.a.1 and 6.b.1.

3.2.3.2.5 Medical Services Drill

Triage and Pre-Hospital Treatment:

The transportation and treatment of a contaminated injured individual was successfully demonstrated by Pickens County Emergency Medical Services (EMS) and Cannon Memorial Hospital during out of sequence activities on August 12, 2010. EMS was notified and responded to a call for an injured person at the Miles Creek Public Boat Landing. Scene assessment, survey and good contamination control procedures were utilized throughout this demonstration. Transport, treatment and decontamination of the patient were appropriate and consistent with his injuries. Both EMS and hospital staff were knowledgeable and implemented personal exposure control at all times. The hospital staff was very methodical in their decontamination of the patient and never lost focus of his injuries during the process.

For this capability the following criteria were met: 1.e.1, 3.a.1 and 6.d.1.

3.2.4 Host Jurisdictions

3.2.4.1 Anderson County, South Carolina

3.2.4.1.1 Reception Center and Congregate Care

Hazardous Materials Response and Decontamination Capability Summary:

The Anderson Civic Center Reception Center was a well laid out facility, minimizing the potential for cross contamination to “clean” evacuees. Monitoring and decontamination staff were knowledgeable of their procedures and properly demonstrated the set up and operational checks for all monitoring and dosimetry equipment. One portal monitor and the DRDs used had not been maintained (calibrated/tested) in accordance with plans. Monitoring staff wore normal work clothing and disposable gloves with additional personal protective equipment being available if needed. Workers checked, recorded and reported the readings of their DRDs every thirty minutes.

The staff employed proper survey techniques, using handheld survey meters to monitor vehicles for contamination. Because they required all evacuees to remain in the vehicle until it reached the monitoring location, workers would not be able to monitor the expected number of evacuees in a 12-hour period while monitoring only one car at a time using handheld meters. Staff directed contaminated vehicles to a separate parking area to be held for future decontamination by the DHEC or Duke Energy contract support personnel.

Monitoring and decontamination staff provided good instructions to evacuees throughout the process. Workers initially screened evacuees for contamination using a portal monitor. Clean individuals were given an orange necklace to indicate to shelter staff that they had been through the monitoring process. Staff then directed the clean evacuees to the shelter registration table. Evacuees who set off the portal monitor alarm were directed down a different path to the decontamination tent. Staff provided contaminated evacuees with a kit containing bags for clothing and valuables, a brush and soap, a marker, a Tyvek suit, and instructions. Evacuees were also given verbal instructions to shower, concentrating on areas where the portal monitor had alarmed. After the showering process, evacuees donned the tyvek suit and booties and were directed to a second portal monitor to be checked. Evacuees who did not alarm this monitor received an orange necklace and were directed to the shelter registration table.

Workers escorted evacuees who alarmed the second portal monitor to inside shower facilities. Separate male and female shower rooms were staffed. After evacuees received instructions and showered again, staff monitored them for contamination using handheld survey meters. The staff used proper survey techniques while monitoring evacuees. Clean evacuees were given a new Tyvek suit, booties, and an orange necklace. Individuals still found to be contaminated showered one more time and were monitored again. Staff stated that if any evacuee was still found to be contaminated, they would notify their supervisor. DHEC would then be notified to arrange for transport of the individual to a medical facility for additional decontamination efforts.

Area Requiring Corrective Action:

Activity: Site Management and Control: In response to activation, mobilize and arrive at the incident scene and initiate response operations to manage and secure the physical layout of the incident.

Observation: Monitoring one vehicle at a time and keeping all occupants with the vehicle until monitored will cause a long delay in monitoring evacuees if the planned number of evacuees arrived at the reception center.

References:

1. SCORERP, Site Specific Section, Part 1, Section IV.B.6.f and Table to Figure 1
2. NUREG-0654 J.12

Analysis: Reception Centers are required to have the capability to monitor, within 12 hours, 20% of the evacuated population of the EPZ which would be directed to it. This reception center services evacuees from zone D-2 which has a population of 19,219. Therefore, the reception center must be able to process over 3800 evacuees in 12 hours, or an average of over 5 evacuees per minute.

All occupants of the vehicle were instructed to remain in their cars until they reached the vehicle monitoring location. Evacuee vehicles were monitored one at

a time by two emergency workers using Ludlum Model 3 survey meters. Therefore, the ability to monitor evacuees at the evacuee monitoring and decontamination location is dependent on vehicle monitoring speed. Assuming that only one lane for monitoring vehicles is used and an average occupancy of 4 evacuees per vehicle, workers would have to monitor one vehicle every 45 seconds in order to process 3800 evacuees (20% of zone D-2) through the evacuee monitoring and decontamination area in 12 hours. This rate is not possible to achieve while using proper survey techniques.

If the planned number of evacuees arrived at the reception center, a large backlog of vehicles and evacuees waiting to be monitored would result.

Recommendations:

1. Set up additional lanes for vehicle monitoring
2. Allow passengers to exit the vehicle and proceed through personal monitoring while the driver remains with the car and/or
3. Use a vehicle portal monitor to reduce backlog of evacuees and their vehicles.

Corrective Actions: Anderson County is reviewing its procedures and will revise as required. Additional training will be provided by the SCEMD FNF staff. Anderson County will re-demonstrate its procedures during the September 18, 2012 Oconee NS Full Scale REP Exercise.

For this capability the following criteria were met: 1.e.1 and 3.a.1.

Mass Care:

The Anderson Civic Center Reception Center and Congregate Care (RCCC) facility had sufficient capacity, supplies, and staff to care for the expected number of evacuees following an incident at ONS. The facility was supported by the American Red Cross (ARC) and is rated to support up to 3,000 people. It has an initial surge capacity for 200 immediate arrivals and is readily scalable up to the maximum capacity. Evacuees may be registered only after providing evidence (an orange necklace) that they have been issued through the monitoring and decontamination process to ensure they are free of any radiological contamination. Shelter staff was knowledgeable in shelter operations and was capable of providing sufficient medical, feeding, and logistical support to any evacuee choosing to stay at the shelter.

For this capability the following criteria were met: 1.e.1 and 6.c.1.

3.2.4.2 Greenville County, Wade-Hampton High School, South Carolina

3.2.4.2.1 Reception Center and Congregate Care

Hazardous Materials Response and Decontamination Capability Summary:

The Wade Hampton High School Reception Center was a well laid out facility, minimizing the potential for cross contamination to “clean” evacuees. Monitoring and decontamination staff was knowledgeable of their procedures and properly demonstrated the set up for all monitoring and dosimetry equipment. Vehicle monitoring staff initially exhibited difficulty properly performing required operational checks on their portable survey meters. Monitoring staff wore normal work clothing and disposable gloves with additional personal protective equipment being available if needed.

The staff employed proper survey techniques, using handheld survey meters to monitor vehicles for contamination. During one vehicle survey, plastic wrap on the survey meter probes began to unravel, causing the film to contact the surface being monitored. This presented the possibility for cross contamination.

When a vehicle was found to be clean, workers placed a green hang tag on the mirror and directed the driver to park in the designated clean lot. Evacuees from the vehicle were then escorted along a path to the portal monitor. When a vehicle was found to be contaminated, workers placed a red hang tag on the mirror and directed the driver to park in the designated “dirty” lot. Evacuees from the vehicle were then escorted along a separate path to the portal monitor. Contaminated vehicles would be held for future decontamination under the direction of DHEC.

Workers initially screened evacuees for contamination using a portal monitor. Clean individuals were given green marks on their hands to indicate to shelter staff that they had been through the monitoring process. Those evacuees were then escorted to the shelter entrance.

Evacuees who alarmed the portal monitor were given red marks on their hands and escorted to shower facilities. Workers at the shower facilities gave evacuees verbal instructions to disrobe, place valuables in a small plastic bag and clothing in a larger bag and shower. Valuables were kept secure by Sheriff’s Office personnel. After evacuees showered, staff monitored them for contamination using handheld survey meters. Workers used proper survey techniques while monitoring evacuees. Clean evacuees were given Tyvek suits and green marks on their hands and then directed to the shelter registration table. Individuals still found to be contaminated showered one more time and were monitored again. Staff stated that if any evacuee was still found to be contaminated, they would notify their supervisor. DHEC would be notified to arrange for transport of the individual to a medical facility for additional decontamination efforts.

For this capability the following criteria were met: 1.e.1, 3.a.1 and 6.a.1.

Mass Care:

The Wade Hampton High School RCCC facility had sufficient capacity, supplies, and staff to care for the expected number of evacuees following an incident at ONS. The facility was supported by the ARC and is rated to support up to 1,164 people. It has an initial surge capacity for 200 immediate arrivals and is readily scalable up to the maximum capacity. Evacuees may

be registered only after providing evidence (a green hand mark) that they have been through the monitoring and decontamination process to ensure they are free of any radiological contamination. Shelter staff was knowledgeable in shelter operations and was capable of providing sufficient medical, feeding, and logistical support to any evacuees choosing to stay at the shelter.

For this capability the following criteria were met: 1.e.1 and 6.c.1.

3.2.4.3 Greenville County, Berea High School, South Carolina

3.2.4.2.2 Reception Center and Congregate Care

Hazardous Materials Response and Decontamination Capability Summary:

The Berea High School Reception Center was a well laid out facility, minimizing the potential for cross contamination to “clean” evacuees. Monitoring and decontamination staff were knowledgeable of their procedures and properly demonstrated the set up and operational checks for all monitoring and dosimetry equipment. Monitoring staff wore normal work clothing and disposable gloves. Additional personal protective equipment was available if needed.

The staff employed proper survey techniques, using handheld survey meters to monitor vehicles for contamination on the street in front of the school. Workers initially screened evacuees for contamination using a portal monitor set up near the vehicle monitoring location. Clean individuals with clean cars were given green marks on their wrists to indicate to shelter staff that they had been through the monitoring process. Clean cars were marked with green duct tape on the windshield and also a green numbered hang tag. Workers then directed evacuees to the designated clean parking lot near the entrance to the shelter and evacuees were directed to the shelter registration table.

Staff marked contaminated vehicles (or vehicles with contaminated evacuees) with red duct tape on the windshield and a red numbered hang tag. Those vehicles were directed to a separate parking area near the entrance to shower facilities. Contaminated vehicles would be held for future decontamination under the direction of DHEC. After parking, evacuees were directed to the shower facilities. Separate male and female shower rooms were staffed.

Workers at the shower facilities gave evacuees verbal instructions to disrobe and shower, placing valuables in a small plastic bag and clothing in a larger bag. Valuables were kept secure by Sheriff’s Office personnel. After evacuees showered, staff monitored them for contamination using handheld survey meters. Workers used proper survey techniques while monitoring evacuees. Clean evacuees were given Tyvek suits and green marks on their wrists. Individuals still found to be contaminated showered one more time and were monitored again. Staff stated that if any evacuee was still found to be contaminated, they would notify their supervisor. That individual would then be directed to a holding room and DHEC would be notified to arrange for transport of the individual to a medical facility for additional decontamination efforts.

For this capability the following criteria were met: 1.e.1, 3.a.1 and 6.a.1.

Mass Care:

The Berea High School Reception Center and Congregate Care facility had sufficient capacity, supplies, and staff to care for the expected number of evacuees following an incident at the Oconee Nuclear Station. The facility is supported by the ARC and is rated to support up to 800 people. It has initial surge capacity for 200 immediate arrivals and is readily scalable up to the maximum capacity. Evacuees may be registered only after providing evidence (a green hand mark) that they have been through the monitoring and decontamination process to ensure they are free of any radiological contamination. Shelter staff was knowledgeable in shelter operations and was capable of providing sufficient medical, feeding, and logistical support to any evacuees choosing to stay at the shelter.

For this capability the following criteria were met: 1.e.1 and 6.c.1.

Section 4: Conclusion

Officials and representatives from the State of South Carolina; the risk counties of Oconee and Pickens; the host counties of Anderson and Greenville, South Carolina; Duke Energy as well as numerous volunteers participated in the exercise. The cooperation and teamwork of the participants was evident throughout all phases of the exercise. FEMA wishes to acknowledge the efforts of the many individuals who participated and made the exercise a success. 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.

State and local emergency response organizations demonstrated knowledge of their emergency response plans and procedures and successfully implemented them.

During this exercise, FEMA identified two areas requiring corrective action (ARCA):

1. Emergency Operations Center Management: SCEMD coordination with the risk counties and the issuance of emergency information/instructions to the public via the prompt alert and notification system was not always conducted with a sense of urgency and without undue delay.

SCEMD has reviewed their procedures and will demonstrate corrective actions during the H.B. Robinson REP Exercise on May 24, 2011.

2. Hazardous Materials Response and Decontamination: The demonstration of the monitoring of evacuees and their vehicles precluded Anderson County from monitoring the 20% of the expected number of evacuees coming to the reception center within a 12 hour period.

Anderson County is reviewing its procedures and will demonstrate corrective actions during the Oconee Full Scale REP Exercise on September 18, 2012.

FEMA has approved the State's schedule of corrective actions and will continue to monitor the progress of the correctives.

Homeland Security Exercise and Evaluation Program (HSEEP)

AAR

2010 Oconee Nuclear Station REP Exercise

Appendix A: Schedule of Corrective Actions

Capability	Area for Improvement	Recommendation	Corrective Action Description	Primary Responsible Agency	Agency POC	Start Completion Date
EOC Management	SCEMD coordination with the risk counties and the issuance of emergency information/instructions to the public via the prompt alert and notification system was not always conducted with a sense of urgency and without undue delay.	Review and revise plans and procedures, as necessary, regarding the receipt of ENFs and modify the coordination/decision making process. A single call between State and county decision makers could improve the process.	SCEMD will demonstrate corrective actions taken during the H.B. Robinson REP Exercise on May 24, 2010. SCEMD will establish a bridge line conference call capability for Decision Line discussions/decision making. SCEMD will ensure that the SEOC and all four counties are tied into the line. The speaker phone in the Governor's Situation Room will be utilized so that all parties, state and counties, may be privy to decision making discussions as they take place in a unified setting.	SCEMD		
HAZMAT Response & Decon	The demonstration of the monitoring of evacuees and their vehicles precluded Anderson County from monitoring the 20% of the expected number of evacuees coming to the reception center within a 12 hour period.	Set up additional lanes for vehicle monitoring Allow passengers to exit the vehicle and proceed through personal monitoring while the driver remains with the car and/or Use a vehicle portal monitor to reduce backlog of evacuees and their vehicles	Anderson County is reviewing its procedures and will demonstrate corrective actions during the Oconee Full Scale REP Exercise on September 18, 2012.	Anderson County		

Appendix B: Lessons Learned and Best Practices

While the After Action Report/Improvement Plan includes recommendations which support development of specific post-exercise corrective actions, exercises may also reveal lessons learned which can be shared with the broader homeland security audience. The Department of Homeland Security (DHS) maintains the *Lessons Learned Information Sharing* (LLIS.gov) system as a means of sharing post-exercise lessons learned with the emergency response community. This appendix provides jurisdictions and organizations with an opportunity to nominate lessons learned from exercises for sharing on *LLIS.gov*.

For reference, the following are the categories and definitions used in LLIS.gov:

- **Lesson Learned:** Knowledge and experience, positive or negative, derived from actual incidents, such as the 9/11 attacks and Hurricane Katrina, as well as those derived from observations and historical study of operations, training, and exercises.
- **Best Practices:** Exemplary, peer-validated techniques, procedures, good ideas, or solutions that work and are solidly grounded in actual operations, training, and exercise experience.
- **Good Stories:** Exemplary, but non-peer-validated, initiatives (implemented by various jurisdictions) that have shown success in their specific environments and that may provide useful information to other communities and organizations.
- **Practice Note:** A brief description of innovative practices, procedures, methods, programs, or tactics that an organization uses to adapt to changing conditions or to overcome an obstacle or challenge.

Exercise Lessons Learned:

There were no lessons learned during the exercise demonstration or indicated during the After Action Conference.

Best Practices:

There were no best practices identified during the exercise demonstration or indicated during the After Action Conference.

Appendix C: Exercise Timeline

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received Or Action Was Taken				
		SEOC	DOSE	JIC	OCONEE CO	PICKENS CO
Alert	0816	0828	0846	N/A	0828	0828
Site Area Emergency	0944	0956	0956	1006	0956	0955
General Emergency	1056	1110	1110	1126	1113	1113
Simulated Rad. Release Started	0933	1024	1024	1120	1024	1024
Simulated Rad. Release Terminated	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Facility Declared Operational		0910	0910	0939	0914	0939
Declaration of State of Emergency	Local	N/A	N/A	0941	0915	0916
	State	0915	N/A	0918	N/A	0915
Exercise Terminated		1244	1244	1252	1243	1245
Early Precautionary Actions: Schools and Ambulance Dependent Patients Evacuated		N/A	N/A	N/A	0945	1043
Nursing Homes and Day Care Evacuated		N/A	N/A	N/A	N/A	0951
Lake Clearing		1035	N/A	1045	1035	1035
Clemson University Released		1029	N/A	N/A	1029	1029
1 st Protective Action Decision: Stay Tuned		1041	N/A	1113	1041	1041
Siren Activation		1055	N/A	N/A	1055	1055
1 st EAS Message		1100	N/A	1114	1100	1100
2 nd Protective Action Decision: Evacuate A0; Shelter B1, C1, D1		1106	N/A	1123	1106	1106
Siren Activation: No Siren Activation		N/A	N/A	N/A	N/A	N/A
2 nd EAS Message		1120	N/A	1123	1120	1120
3 rd Protective Action Decision: Evacuate B1, B2, C1, C2, D1, D2		1135	N/A	1143	1135	1135
Siren Activation		1145	N/A	N/A	1145	1145

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received Or Action Was Taken				
		SEOC	DOSE	JIC	OCONEE CO	PICKENS CO
3 rd EAS Message		1150	N/A	1143	1150	1150
4 th Protective Action Decision: Ingest KI for Public and EWs in Evacuated Zones		1225	N/A	1231	1225	1225
Siren Activation		1230	N/A	1230	1230	1230
4 th EAS Message		1235	N/A	1235	1235	1235

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Appendix D: Exercise Evaluator and Assignments

Oconee Nuclear Station		2010 REP Exercise	
Location	Evaluator	Criterion	Capability
Joint Operations			
Emergency Operations Facility	Robert Trojanowski (NRC)	2.b.1	EOC Management
Joint Information Center	Bill Larrabee (ICF) Bob Spence (FEMA) Doc Burris (ICF)	1.a.1, 1.c.1, 1.d.1, 1.e.1, 5.b.1	Emergency Public Information and Warning
State of South Carolina			
State EOC	JT Ackermann (FEMA) Gerald McLemore (FEMA) Walt Cushman (FEMA) Henry Christiansen (ICF)	1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 5.a.1, 5.b.1	EOC Management, Emergency Public Information and Warning
DHEC Dose Assessment	Joe Keller (ICF)	1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 4.a.2	HAZMAT Decontamination & Response
State TCPs	Matt Bradley (FEMA)	1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1, 3.d.2	Emergency Public Safety & Security Response
Waterway Warning	Matt Bradley (FEMA)	1.d.1, 1.e.1, 3.a.1, 3.b.1, 5.a.3	Emergency Public Safety & Security Response
EAS Radio Station (LP1)	Robert Nash (FEMA)	1.d.1, 1.e.1, 5.a.1	Emergency Public Information and Warning
Risk Jurisdictions			
Oconee County, South Carolina			
Emergency Operations Center	Alex Sera (FEMA) Ron Shaw (FEMA) Mark Dalton (ICF))	1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.c.2, 3.d.1, 3.d.2, 5.a.1, 5.b.1	EOC Management, Emergency Public Information and Warning,
Protective Actions for Schools	Mark Dalton (ICF)	3.c.2	Citizen Evacuation & Shelter in Place
Backup Route Alerting	Ron Shaw (FEMA)	3.a.1, 5.a.3	Emergency Public Safety and Security Response
Emergency Worker & Vehicle Decontamination	Alex Sera (FEMA) Ron Shaw (FEMA) Joe Harworth (FEMA)	1.e.1, 3.a.1, 6.a.1, 6.b.1	HAZMAT Decontamination & Response
Pickens County, South Carolina			

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Emergency Operations Center	Joe Harworth (FEMA) Lisa Rink (FEMA) Joe Inman (ICF)	1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.c.2, 3.d.1, 3.d.2, 5.a.1, 5.b.1	EOC Management, Emergency Public Information and Warning,
Protective Actions for Schools	JT Ackermann (FEMA)	3.c.2	Citizen Evacuation & Shelter in Place
Backup Route Alerting	Joe Inman (ICF)	3.a.1, 5.a.3	Emergency Public Safety and Security Response
Emergency Worker & Vehicle Decontamination	JT Ackermann (FEMA) Walt Cushman (FEMA)	1.e.1, 3.a.1, 6.a.1, 6.b.1	HAZMAT Decontamination & Response
Medical Services Drill	Joe Harworth (FEMA) JT Ackermann (FEMA) Walt Cushman (FEMA)	1.e.1, 3.a.1, 6.d.1	Triage & Pre- Hospital Treatment
Host Jurisdictions			
Anderson County, South Carolina			
Reception Center Congregate Care	John Fill (FEMA) Obhie Robinson (FEMA) Jon Sandberg (FEMA)	1.e.1, 3.a.1, 6.a.1, 6.c.1	HAZMAT Decontamination & Response, Mass Care
Greenville County, South Carolina			
Reception Center Congregate Cares	John Fill (FEMA) Obhie Robinson (FEMA) Jon Sandberg (FEMA)	1.e.1, 3.a.1, 6.a.1, 6.c.1	HAZMAT Decontamination & Response, Mass Care

Appendix E: Acronyms

Acronym	Meaning
AAC	After Action Conference
AAR	After Action Report
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARES	Amateur Radio for Emergency Services
CFR	Code of Federal Regulations
CMC	Corporate Media Center
DEMD	Deputy Emergency Management Director
DHEC	Department of Health and Environmental Control
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
DPH	Department of Public Health
DRD	Direct-Reading Dosimeter
DSS	Department of Social Services
EAL	Emergency Action Level
EAS	Emergency Alert System
ECL	Emergency Classification Level
EEG	Exercise Evaluation Guide
EMA	Emergency Management Agency
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOPA	Extent of Play Agreement
EMD	Emergency Management Director
EMITS	Emergency Management Information Tracking System
EPA	Environmental Protection Agency
EP/IP	Emergency Plan Implementing Procedure
EPZ	Emergency Planning Zone
ER	Emergency Room
ERC	Emergency Response Coordinator
ERDS	Emergency Response Data System
ERP	Emergency Response Plan
ESF	Emergency Support Function
EW	Emergency Worker

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Acronym	Meaning
EWD	Emergency Worker Decontamination
EXPLAN	Exercise Plan
FEMA	Federal Emergency Management Agency
FEOC	Forward Emergency Operations Center
FMT	Field Monitoring Team
FOUO	For Official Use Only
FRMAC	Federal Radiological Monitoring and Assessment Center
GE	General Emergency
GIS	Geographic Information System
GM	Geiger-Muller (detector)
GPS	Geographic Positioning System
HAZMAT	Hazardous Materials
HO	Health Order
HSEEP	Homeland Security Exercise and Evaluation Program
HQ	Headquarters
IC	Incident Commander
ICS	Incident Command System
IMT	Incident Management Team
IP	Improvement Plan
IRG	Information Response Group
IRIS	Internet Routed Information System
IPZ	Ingestion Pathway Zone
JIC	Joint Information Center
KI	Potassium Iodide
LP-1	Local Primary -1
MOC	Mobile Operations Center
MOU	Memorandum of Understanding
mR	milliroentgen
mR/h	milliroentgen per hour
NAWAS	National Warning System
NGO	Non-Governmental Organization
NIMS	National Incident Management System
NOUE	Notification of Unusual Event
NPP	Nuclear Power Plant
NRC	Nuclear Regulatory Commission
NUREG-0654	NUREG-0654/FEMA-REP-1, Rev. 1, <i>"Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980</i>
ONS	Oconee Nuclear Station
OOS	Out-of-Sequence

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2010 Oconee Nuclear Station REP Exercise

Acronym	Meaning
ORO	Offsite Response Organization
PA	Public Announcement
PAD	Protective Action Decision
PAG	Protective Action Guide
PAR	Protective Action Recommendation
PIO	Public Information Officer
PPE	Personal Protective Equipment
PRD	Permanent Record Dosimetry
R	Roentgen
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Service
REA	Radioactive Emergency Area
REM	Roentgen Equivalent Man
REP	Radiological Emergency Preparedness
REPP	Radiological Emergency Preparedness Program
RERP	Radiological Emergency Response Plan
R/h	Roentgen(s) per hour
RO	Radiological Officer
SAE	Site Area Emergency
SC	South Carolina
SCEMD	South Carolina Emergency Management Division
SCDNR	South Carolina Department of Natural Resources
SCHP	South Carolina Highway Patrol
SDOC	School District of Oconee County
SEOC	State Emergency Operations Center
SIMCELL	Simulation Cell
SIP	Shelter-in-Place
SLED	State Law Enforcement Division
SMRAP	Southern Mutual Radiological Assistance Plan
SOG	Standard Operating Guide
SOP	Standard Operating Procedure
SSS	Selective Signaling System
TCL	Target Capabilities List
TCP	Traffic Control Point
THD	Technological Hazard Division
TLD	Thermoluminescent dosimeter
USDA	U.S. Department of Agriculture
UTL	Universal Task List
VFD	Volunteer Fire Department

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Appendix F: Exercise Locations

Exercise Locations
South Carolina Emergency Management Division (SCEMD) State EOC (SEOC) 2779 Fish Hatchery Road West Columbia, SC 29172
South Carolina Department of Health and Environmental Control (DHEC) 2779 Fish Hatchery Road West Columbia, SC 29172
Emergency Alert Station WFBC, FM 93.7 25 Garlington Road Greenville, SC 29615
Joint Information Center Duke Power Company (DPC) JIC 664 Issaqueena Trail Clemson, SC 29631
Duke Energy EOF Duke Energy Building 422 South Church Street Charlotte, NC 28202
Oconee County Emergency Operation Center (EOC) 300 South Church St. Walhalla, SC 29691
Pickens County Emergency Operation Center (EOC) 1509 Walhalla Highway Pickens, SC 29671

Out of Sequence Locations
Oconee County EWD Oakway Middle School 150 School House Rd Westminster, SC 29693
Pickens County EWD County Decon Facility Jail House Road Pickens, SC 29671
Pickens County Schools Pickens County EOC 1509 Walhalla Highway Pickens, SC 29671
Medical Services Drill Cannon Memorial Hospital 123 WG Acker Drive Pickens, SC 29671
Anderson County RCCC Anderson County Civic Center 3027 Martin Luther King Jr. Blvd Anderson, SC 29625
Greenville County RCCC Berea High School 201 Burdine Dr. Greenville, SC 29617
Greenville County RCCC Wade Hampton High School 100 Pine Knoll Dr. Greenville, SC29609

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Appendix G: Exercise Planning Team Leadership

Agency	Name	Email	Phone
Oconee Nuclear Station (ONS)	Rodney Brown	rodney.brown@duke-energy.com	864-873-3301
ONS	Robert Taylor	robert.taylor@duke-enrgy.com	864-873-3208
FEMA Region IV	Larry Robertson	larry.robertson@dhs.gov	770-220-5378
FEMA Region IV	Joseph Harworth	joseph.harworth@dhs.gov	770-220-5464
FEMA Region IV	JT Ackermann	john.ackermann@dhs.gov	770-220-3175
South Carolina Emergency Management Division	Ernie Moore	emoore@emd.state.sc.us	803-737-8500
South Carolina Emergency Management Division	Joel Parsons	jparsons@emd.state.sc.us	803-737-8593
Oconee County Emergency Services	Scott Krein	skrein@oconeesc.com	864-638-4200
Pickens County Emergency Management	Lynn Fisher	lynnf@co.pickens.sc.us	864-898-5943

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