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FEMA

MAR 23 2012

NRC Headquarters' Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555-0001

To Whom It May Concern:

Enclosed is the After Action Report/Improvement Plan for the October 18, 2011, Calvert Cliffs Nuclear Power Plant Radiological Emergency Preparedness Exercise.

No deficiencies were identified during the exercise. Twelve (12) Areas Requiring Corrective Action (ARCAs) were identified and successfully re-demonstrated. Four (4) planning issues were identified with three (3) remaining open.

Based on the results of the exercise and a review of the offsite radiological emergency response plans and procedures submitted, FEMA Region III has determined they are adequate and there is reasonable assurance they can be implemented, as demonstrated during this exercise.

If you have any further questions, please contact me or the Calvert Cliffs Nuclear Power Plant Project Officer, Robert Neff, at (215) 931-5531.

Sincerely,

MaryAnn Tierney
Regional Administrator

Enclosure

IX49
NRR

Calvert Cliffs Nuclear Power Plant

After Action Report/ Improvement Plan

Exercise Date - October 18, 2011

Radiological Emergency Preparedness (REP) Program

FEMA

Published March 09, 2012

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Calvert Cliffs Nuclear Power Plant

After Action Report/Improvement Plan

Published March 09, 2012

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EXECUTIVE SUMMARY

On October 18, 2011, a full-scale plume exercise was demonstrated and evaluated for the 10 Mile Emergency Planning Zone (EPZ) exposure pathway around the Calvert Cliffs Nuclear Power Plant (CCNPP) by the Federal Emergency Management Agency (FEMA), Region III. Out-of-Sequence demonstrations were conducted on July 13, 14 and 15, 2011. The purpose of the Exercise and Out-of-Sequence demonstrations was to assess the capabilities of State, county, and local jurisdictions to implement Radiological Emergency Plans and Procedures (RERP) to protect the property and lives of residents and transients in the event of an emergency at the CCNPP.

The findings in this report are based on the evaluations of the Federal evaluator team, with final determinations made by the FEMA, Region III Radiological Assistance Committee (RAC) Chairperson, and approved by FEMA Headquarters. These reports are provided to the Nuclear Regulatory Commission (NRC) and participating states. State and local governments utilize the findings contained in these reports for the purposes of planning, training, and improving emergency preparedness.

The most recent full-scale exercise at this site was evaluated in October 2009.

The evaluation of this Exercise determined that there were no Deficiencies and twelve (12) Areas requring Corrective Action (ARCAs) identified as a result of this exercise. All ARCAs (12) were successfully re-demonstrated during the exercise or during remedial re-demonstrations held on January 27 and February 7, 2012. There were four (4) new Planning Issues identified. One (1) new Planning Issue was resolved before the release of this report and three (3) remain open. In addition, one (1) Planning Issue from the 2009 CCNPP Plume exercise, that was applicable to the Maryland Department of Environment (MDE), was resolved prior to this exercise.

FEMA wishes to acknowledge the efforts of many individuals in the State of Maryland and its three risk counties (Calvert, St. Mary's and Dorchester) that were evaluated at this exercise.

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 responibility by volunteering to provide vital emergency services to their communities. Cooperation and teamwork of all the participants were evident during the exercise.

SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name
Calvert Cliffs Nuclear Power Plant

Type of Exercise
Plume

Exercise Date
October 18, 2011

Program
Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

Scenario Type
Radiological Emergency

1.2 Exercise Planning Team Leadership

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1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Calvert Cliffs Nuclear Power Plant exercise:

State Jurisdictions

- Maryland Department of Agriculture
- Maryland Department of the Environment
- Maryland Department of General Services
- Maryland Department of Health and Mental Hygiene
- Maryland Department of Human Resources

Maryland Department of Natural Resources
Maryland Department of Transportation
Maryland Emergency Management Agency
Maryland Fire and Rescue
Maryland Institute for Emergency Medical Service Systems
Maryland Joint Operations Center
Maryland National Guard
Maryland Natural Resources Police
Maryland Public Service Commission
Maryland State Department of Education
Maryland State Highway Department
Maryland State Police
Maryland Transit Authority Police
Delaware Emergency Management Agency

Risk Jurisdictions

Calvert County Agriculture - Farm Services
Calvert County Commissioner
Calvert County Communications
Calvert County Division of Emergency Management
Calvert County Fire Rescue Emergency Medical Services
Calvert County General Services
Calvert County Public Information Officer
Calvert County Public Health
Calvert County Public Safety
Calvert County Public Transportation
Calvert County Public Works
Calvert County Radiological Officer
Calvert County Schools
Calvert County Sheriff's Office
Calvert County Social Services
Calvert County Technology Services/Geographic Information Systems
Cambridge Police Department
Dorchester County 911
Dorchester County Department of Public Works

- Dorchester County Department of Social Services
- Dorchester County Emergency Management
- Dorchester County Emergency Medical Services
- Dorchester County Health Department
- Dorchester County Highway Department
- Dorchester County Sheriff's Office
- St. Mary's County Agriculture Department
- St. Mary's County Emergency Operations Center Staff
- St. Mary's County Fire Department
- St. Mary's County HazMat Team
- St. Mary's County Health Department
- St. Mary's County Highway Administration
- St. Mary's County Public Information Officer
- St. Mary's County Public Schools
- St. Mary's County Rescue
- St. Mary's County Sheriff's Office
- St. Mary's County Social Services
- Taylors Island Volunteer Fire Department

Private Organizations

- American Red Cross
- Calvert Memorial Hospital
- Constellation Energy
- Eastern Shore Health Center
- Radio Amateur Civil Emergency Services
- Share Health Systems
- St. Mary's Hospital

Federal Jurisdictions

- National Weather Service
- U.S. Coast Guard
- U.S. Department of Agriculture - Farm Services Administration

SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

Introduction:
On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead responsibility for all off-site nuclear planning and response. FEMA's activities were conducted pursuant to 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.

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 Radiological Emergency Response Plans (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 the following Federal agencies with responsibilities in the radiological emergency planning process:

- U.S. Department of Commerce
- U.S. Nuclear Regulatory Commission
- U.S. Environmental Protection Agency

- U.S. Department of Energy
- U.S. Department of Health and Human Services
- U.S. Department of Transportation
- U.S. Department of Agriculture
- U.S. Department of the Interior
- U.S. Food and Drug Administration

Representatives of these agencies serve on the FEMA Region III Radiological Assistance Committee (RAC).

These reports are provided to the NRC and participating States. State and local governments utilize the findings contained in these reports for the purposes of planning, training, and improving emergency response capabilities.

The criteria utilized in the FEMA evaluation process are contained in the following: 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 Guidance Memoranda MS-1, "Medical Services," November 1986; FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991; 66 FR 47546, "FEMA Radiological Emergency reparedness: Alert and Notification, "September 12, 2001; and 67 FR 20580, "FEMA Radiological Emergency Preparedness: Exercise Evaluation Methodology," April 25, 2002.

Section 1 of this report, entitled "Exercise Overview," presents the Exercise Planning Team and the Participating Organizations.

Section 2, entitled "Exercise Design Summary," includes the "Exercise Purpose and Design," "Exercise Objectives, Capabilities, and Activities," and the "Scenario Summary."

Section 3 of this report, entitled "Analysis of Capabilities," presents detailed information on the demonstration of applicable exercise evaluation areas at each jurisdiction or functional entity evaluated in a jurisdiction-based, issues-only format. This section also contains:

(1) Descriptions of all Deficiencies, Areas Requiring Corrective Action (ARCAs,)and Planning Issues assessed during this exercise, including recommended corrective actions and the State and

local governments' schedule of corrective actions for each identified exercise issue;

(2) Descriptions of ARCAs and Planning Issues assessed during previous exercises and resolved at this exercise,including the corrective action demonstrated, as well as ARCAs or Planning Issues assessed during previous exercises and scheduled for demonstration at this exercise which remain unresolved.

Section 4, "Conclusion," is a description of the Region's overall assessment of the capabilities of the participating organizations.

Appendix A - Improvement Plan. A description of Areas Requiring Corrective Action and Planning Issues , the parties responsible for implementing a corrective action and time frame for completion.

Appendix B - Exercise Time Line. A table that depicts the times that events and notifications were noted at participating agencies and locations.

Appendix C - Exercise Evaluators and Team Leaders. A table listing the names,organizations, and evaluation responsibilities of the evaluators and management.

Appendix D - Acronyms and Abbreviations. An alphabetized table defining the acronyms and abbreviations used in this report.

Appendix E - Exercise Plan. A narrative description of information developed to implement the exercise including the Extent of Play Agreement with a detailed description of the exercise criteria and the participants' expected responses to the exercise scenario.

Plume Exposure Pathway EPZ Description:

The Calvert Cliffs Nuclear Power Plant (CCNPP) is located near Maryland Highway 2-4 in Calvert County, Maryland, on the west bank of the Chesapeake Bay near Lusby, Maryland. The site is owned and operated by Constellation Energy Group and covers an area of approximately 2,108 acres. Seventy percent of the area remains forested and relatively undisturbed by CCNPP activities. There are several endangered plant and insect species within the boundaries of the site. Two pressurized water reactors each generate an electrical output of 825 MW that provide power

to around 400,000 residential customers. Unit 1 began commercial operation during May 1975 and Unit 2 in April 1977. On March 23, 2002, the license was renewed, thereby extending the life of the plant by 20 years.

Nearby communities include: Calvert Beach and Long Beach, approximately 3 miles to the northwest; Cove Point, approximately 4 1/2 miles to the southeast; Chesapeake Ranch Estates, approximately 6 miles to the south-southwest; and the Patuxent Naval Air Test Center, approximately 10 miles to the south. Camp Bay Breeze, a summer camp, is located 2 miles southeast of the site.

The topography of the vicinity around the plant defines several small watersheds. The watershed containing the plant and auxiliary structures drains into the Chesapeake Bay. The Chesapeake Bay has an average depth of 30 feet and receives the majority of its fresh water, sediment, and nutrients from the Susquehanna River.

A majority of the land in the area surrounding the site is devoted to agricultural and forest use, such as farming of tobacco, corn, soybeans, and hay. Dairy farming is of minor importance. The waters adjacent to the site are used for commercial fishing, primarily for shellfish such as clams, oysters, and crabs.

There are approximately 58,058 people in the 10-mile EPZ, 13,307 in the 5-mile EPZ, and 2,329 in the 2-mile EPZ. There are approximately 9,563 transients within the EPZ during peak seasonal activities, e.g., daytime, during the summer. No major populated cities (greater than 25,000) exist within the 10-mile EPZ.

2.2 Exercise Objectives, Capabilities and Activities

The objective of the CCNPP 2011 Plume Exercise was to demonstrate the capabilities of State and local emergency management agencies to mobilize emergency management and emergency response personnel, to activate emergency operations centers and support facilities, and to protect the health, lives, and property of the citizens residing within the 10 mile Emergency Planning Zone (EPZ).

To demonstrate the ability to communicate between multiple levels of government and provide timely, accurate, and sufficiently detailed information to the public, the emergency management

agencies used a variety of resources including radios, telephones, the Internet, the media, the Emergency Alert System (EAS), and the utility Alert and Notification System sirens (ANS). All of these communications resources were employed and evaluated. The EAS and ANS was simulated and media information was prepared but not actually released.

An essential capability of the Radiological Emergency Preparedness Program (REPP) is to evacuate, monitor and decontaminate if necessary, and provide temporary care and shelter to displaced residents from the EPZ. The ability of the counties to mobilize personnel and resources to establish reception, monitoring and decontamination, and mass care centers was demonstrated.

The protection of school children is also a vital mission of the REPP. School districts and selected schools demonstrated the capability to communicate and coordinate the collection, evacuation, transportation and shelter of students attending schools within the EPZ. Provisions for students who live within the EPZ but attend school outside were also evaluated.

2.3 Scenario Summary

NOTE: All information below is scenario simulated. The times for the events are approximate as the NRC licensee's operations crew on the reactor training simulator will be provided opportunity for free play.

At 0800 on October 18, 2011, the exercise starts in the CCNPP Unit 1 Training Simulator control room. It is raining. The wind speed is 12 miles per hour and the wind direction is from the southwest to the northeast. CCNPP Unit 1 and Unit 2 are operating at 100 percent power. At 0809 the Control Room receives an alarm indicating that a fire pump has started and a sprinkler head has opened in the Auxiliary Feed Water Pump room. There are also reports of a steam release in the Auxiliary Feed Water Pump room.

On or before 0822 the Shift Manager declares an Alert under EAL A.A.6.2.3 for a "steam leak in a safe shutdown area which results in either visible damage to plant structures or equipment needed for safe shutdown or affected safety system performance is degraded indicating damage to safety systems."

At 0830 the National Weather Service issues a Tornado Watch for Southern Maryland. At 0845 the Control Room receives a high water alarm for the 1A Diesel Generator. At 0855 the NWS

issues a Tornado Warning for Southern Maryland. At 0915 a Tornado knocks down the 69 kV electric supply line to Calvert Cliffs. At 0929 the Steam Generator Feed Pump trips. At 0930 the Operators manually shut down the reactor.

At 0936 a second Tornado knocks down the three high lines supplying power to the plant. The Tornado proceeds through uninhabited property to the Bay and dissipates. The CCNPP experiences a Loss of Offsite Power. On Unit 1, one of the two emergency diesel generators starts and loads. The other emergency diesel generator fails to start. On Unit 2 both the emergency diesel generators start and load. The fifth back-up emergency diesel generator has also failed to start. At 1005 a Power Operated Relief Valve sticks open and a High Pressure Safety Injection Pump trips. At this point Unit 1 will not be able to cool the nuclear core.

On or before 1020 the Emergency Director declares a Site Area Emergency under EAL H.S.5.1.3 for a loss or potential loss of any two containment barriers. There is a potential loss of the fuel clad barrier due to loss of heat removal and a potential loss of the reactor coolant barrier due to sub cooling less than 25 degrees. The wind speed is 19 miles per hour and the wind direction is from the southwest to the northeast. It is raining.

Between 1020 and 1154 the reactor water level steadily decreases until the core is uncovered. Core Exit Thermocouples and the Containment High Range Radiation Monitor readings continue to increase to levels indicating that the fuel clad has been severely damaged. At 1145 the wind direction changes and it is now from the southeast to the northwest.

On or before 1209 the Emergency Director declares a General Emergency under EAL H.G.5.1.4 for the loss of any two barriers and a potential loss of a third barrier. There is a loss of the fuel clad and the reactor coolant barrier and a potential loss of the reactor containment. The expected CCNPP PAR based on degrading plant conditions will be to evacuate the 2 mile ring and 5 miles downwind (PAZ 1 and PAZ 2), take potassium iodide and shelter the remainder of the EPZ. There are no releases in progress at this time. The wind speed is 22 miles per hour and the wind direction is from the southeast to the northwest. It is still raining.

At 1245 a hydrogen gas burn in containment causes damage to the Personnel Air Lock seals opening a release pathway for radioactive material from the Reactor Containment Building into the Auxiliary Building and then out the Auxiliary Building Vent to the environment. The radioactive release is monitored but it is not filtered. The wind speed is 18.7 miles per hour, the

stability class is D and the wind is from the southeast into the northwest. The rain has stopped. The dose assessment team determines that the EPA PAG for the adult thyroid is exceeded out to 2 miles from the site.

At 1300 the CCNPP technical assessment of core damage is that there is over-heating of the fuel pellets and the possibility of a core melt in the reactor vessel. By 1400 the containment high range radiation monitor reads 1.8E+6 R per hour. It is possible that the State of MD may decide to evacuate additional areas such as PAZ 4 and 5.

At 1400 the spare fifth emergency diesel generator is repaired and will supply power to the disabled safety systems on Unit 1. The containment high range radiation monitor starts a slow downward trend in reading. However, the Auxiliary Building vent monitor continues its upward trend, indicating that there is still a significant inventory of radioactive material inside the buildings waiting to be released. Radioactive releases will continue through to the termination of the exercise.

At 1500 the Lead Controller terminates the exercise, if the evaluators indicate that the onsite and offsite objectives have been met.

SECTION 3: ANALYSIS OF CAPABILITIES

3.1 Exercise Evaluation and Results

The matrix in Table 3.1, on the following pages, presents the status of the exercise evaluation area criteria from the REP Exercise Evaluation Methodology that were scheduled for demonstration during this exercise by all participating jurisdictions and functional entities. Exercise evaluation area criteria are listed by number and the demonstration status of the criteria is indicated by the use of the following letters:

(M) Met (No Deficiency or Area Requiring Corrective Action (ARCA) assessed and no unresolved ARCAs from this or prior exercises)

(A) ARCA(s)

(P) Planning issues

3.2 Summary Results of Exercise Evaluation

Contained in this section are the results and findings of the evaluation of all jurisdictions and locations that participated in the July 13 -15 out of sequence evaluations and the October 18 - 19, 2011, biennial Radiological Emergency Preparedness (REP) exercise. The exercise was held to test the offsite emergency response capabilities of local governments in the 10-mile Emergency Planning Zone (EPZ) surrounding the Calvert Cliffs Nuclear Power Plant (CCNPP).

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of the exercise evaluation area criteria contained in the REP Exercise Evaluation Methodology. Detailed information on the Exercise Evaluation Area criteria and the Extent of Play agreement used in this exercise are found in Appendix E of this report.

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.

Table 3.1 - Summary of Exercise Evaluation (3 pages)

DATE: 2011-10-18 SITE: Calvert Cliffs Nuclear Power Plant, MD M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		MD EOC	MD AAC MDE	MDACC EOF Brstw	MD JIC Brstw	MD SFMT A	MD SFMT B	CalCoEOC	CalCo FMT	CalCo BuRA	CalCo TACP	CalCoEWMDSSfdLdfl	CalCo RC HHS
Emergency Operations Management													
Mobilization	1a1	M	M		M	M	M	M		M	M		
Facilities	1b1												
Direction and Control	1c1	M	M	M				M					
Communications Equipment	1d1	M	M	M		M	M	M	M	M	M		M
Equip & Supplies to support operations	1e1	M	M	M	M	M	M	M	M	M	M	M	M
Protective Action Decision Making													
Emergency Worker Exposure Control	2a1		M	M				M					
Rad Assessment and PARs for the Plume Phase Emergency	2b1		M	M									
PADs for the General Public for the Plume Phase Emergency	2b2	M	M	M				M					
Protective Action Decisions for protection of special populations	2c1	M						M					
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1												
Rad Assessment and Decision making for Relocation/Reentry/Return	2e1												
Protective Action Implementation													
Implementation of emergency worker exposure control	3a1					M	M	M	M	M	M	M	M
Implementation of KI decision	3b1		M			M	M	M	M	M	M	M	
Implementation of protective actions for special populations	3c1							P					
Implementation of protective actions for Schools	3c2												
Implementation of traffic and access control	3d1	M						M			M		
Impediments to evacuation	3d2							M			M		
Implementation of ingestion pathway decisions - availability/use of info	3e1												
Materials for Ingestion Pathway PADs are available	3e2												
Implementation of relocation/re-entry/return decisions.	3f1												
Field Measurement and Analysis													
Adequate Equipment for Plume Phase Field Measurements	4a1					M	M		M				
Field Teams obtain sufficient information	4a2			M				M					
Field Teams Manage Sample Collection Appropriately	4a3					M	M		M				
Post plume phase field measurements and sampling	4b1												
Laboratory operations	4c1												
Emergency Notification and Public Info													
Activation of the prompt alert and notification system	5a1	M						M					
Activation of the prompt alert and notification system - Fast Breaker	5a2												
Exception Area/Backup Route Alerting	5a3							M		M			
Reserved	5a4												
Emergency information and instructions for the public and the media	5b1	M			M			M					
Support Operations/Facilities													
Mon/Decon of Evacuees/Emerg Workers/Registration of Evacuees	6a1											M	M
Montoring and decontamination of emergency workers and their equipment	6b1											M	
Temporary care of evacuees	6c1												
Transportation and treatment of contaminated injured individuals	6d1												

Table 3.1 - Summary of Exercise Evaluation (Continued. page 2/3)

DATE: 2011-10-18 SITE: Calvert Cliffs Nuclear Power Plant, MD M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		CalCo MDC HHS	CalCo CCC HHS	DoCo EOC	DoCo FMT	DoCo BuRA	DoCo TACP	DoCoRCDoCoCTC	DoCoMDCCTC	DoCoMCCDCCTC	DoCoEWMDSCTC	SMCo EOC	SMCo FMT
Emergency Operations Management													
Mobilization	1a1			M		M	M					M	
Facilities	1b1							M	M	M	M		
Direction and Control	1c1			M								M	
Communications Equipment	1d1			M	M	M	M					M	M
Equip & Supplies to support operations	1e1	M	M	P	M	M	M	M	M	M	M	M	M
Protective Action Decision Making													
Emergency Worker Exposure Control	2a1			M								M	
Rad Assessment and PARs for the Plume Phase Emergency	2b1												
PADs for the General Public for the Plume Phase Emergency	2b2											M	
Protective Action Decisions for protection of special populations	2c1			M								M	
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1												
Rad Assessment and Decision making for Relocation/Reentry/Return	2e1												
Protective Action Implementation													
Implementation of emergency worker exposure control	3a1	M		M	M	M	M	M	M		M	M	M
Implementation of KI decision	3b1	M		M	M	M	M		M		M	M	M
Implementation of protective actions for special populations	3c1			M								M	
Implementation of protective actions for Schools	3c2												
Implementation of traffic and access control	3d1			M			M					M	
Impediments to evacuation	3d2			M			M					M	
Implementation of ingestion pathway decisions - availability/use of info	3e1												
Materials for Ingestion Pathway PADs are available	3e2												
Implementation of relocation/re-entry/return decisions.	3f1												
Field Measurement and Analysis													
Adequate Equipment for Plume Phase Field Measurements	4a1				M								M
Field Teams obtain sufficient information	4a2			M								M	
Field Teams Manage Sample Collection Appropriately	4a3				M								M
Post plume phase field measurements and sampling	4b1												
Laboratory operations	4c1												
Emergency Notification and Public Info													
Activation of the prompt alert and notification system	5a1			M								M	
Activation of the prompt alert and notification system - Fast Breaker	5a2												
Exception Area/Backup Route Alerting	5a3			M		M						M	
Reserved	5a4												
Emergency information and instructions for the public and the media	5b1			M								M	
Support Operations/Facilities													
Mon/Decon of Evacuees/Emerg Workers/Registration of Evacuees	6a1	M						M	M		M		
Montoring and decontamination of emergency workers and their equipment	6b1										M		
Temporary care of evacuees	6c1		M							M			
Transportation and treatment of contaminated injured individuals	6d1												

Table 3.1 - Summary of Exercise Evaluation (Continued. page 3/3)

DATE: 2011-10-18 SITE: Calvert Cliffs Nuclear Power Plant, MD M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		SMCo BuRA	SMCo TACP	SMCo RC LHMS	SMCEWDLHMS	SMCo MDC LHS	SMCo CC LHMS	CalCo PS DES	CalCo PS MES	CalCo PS PHS	SMCo PS HES	SMCo PS TCES
Emergency Operations Management												
Mobilization	1a1	M	M									
Facilities	1b1											
Direction and Control	1c1											
Communications Equipment	1d1	M	M	M								
Equip & Supplies to support operations	1e1	M	M	M	M	M	M					
Protective Action Decision Making												
Emergency Worker Exposure Control	2a1											
Rad Assessment and PARs for the Plume Phase Emergency	2b1											
PADs for the General Public for the Plume Phase Emergency	2b2											
Protective Action Decisions for protection of special populations	2c1											
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1											
Rad Assessment and Decision making for Relocation/Reentry/Return	2e1											
Protective Action Implementation												
Implementation of emergency worker exposure control	3a1	M	M	M	M	M						
Implementation of KI decision	3b1	M	M		M	M						
Implementation of protective actions for special populations	3c1											
Implementation of protective actions for Schools	3c2							M	M	M	M	M
Implementation of traffic and access control	3d1		M									
Impediments to evacuation	3d2		M									
Implementation of ingestion pathway decisions - availability/use of info	3e1											
Materials for Ingestion Pathway PADs are available	3e2											
Implementation of relocation/re-entry/return decisions.	3f1											
Field Measurement and Analysis												
Adequate Equipment for Plume Phase Field Measurements	4a1											
Field Teams obtain sufficient information	4a2											
Field Teams Manage Sample Collection Appropriately	4a3											
Post plume phase field measurements and sampling	4b1											
Laboratory operations	4c1											
Emergency Notification and Public Info												
Activation of the prompt alert and notification system	5a1											
Activation of the prompt alert and notification system - Fast Breaker	5a2											
Exception Area/Backup Route Alerting	5a3	M										
Reserved	5a4											
Emergency information and instructions for the public and the media	5b1											
Support Operations/Facilities												
Mon/Decon of Evacuees/Emerg Workers/Registration of Evacuees	6a1			M	M	M						
Montoring and decontamination of emergency workers and their equipment	6b1				M							
Temporary care of evacuees	6c1						M					
Transportation and treatment of contaminated injured individuals	6d1											

3.3 Criteria Evaluation Summaries

3.3.1 Maryland Jurisdictions

3.3.1.1 Maryland Emergency Operations Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.b.2, 2.c.1, 3.d.1, 5.a.1, 5.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.2 Maryland Accident Assessment Center, Maryland Department of the Environment

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 2.b.2, 3.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.3 Maryland State Accident Assessment Center, Emergency Operations Facility Barstow

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 2.b.2, 4.a.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None

f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.4 Maryland Joint Information Center, Barstow

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.e.1, 5.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.5 Maryland State Field Monitoring Team A

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: 4.a.1.

ISSUE NO.: 11-11-4a1-A-01

CRITERION: Field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates.

CONDITION: State Field Monitoring Team A had a supply of silver zeolite cartridges with an expiration date of 12/2010. The entire stock in storage had expired.

POSSIBLE CAUSE: Maryland Department of the Environment (MDE) procedures do not contain a trigger mechanism to determine whether the silver zeolite cartridges have expired, only to determine that cartridges are in the inventory supply.

REFERENCE: NUREG-0654, H.10., I.8., 9., 11.

EFFECT: No effect during the exercise as charcoal cartridges were used. However,

use of expired cartridges could have decreased the efficiency of radioiodine collection and may have led to an incorrect radiological assessment by MDE.

CORRECTIVE ACTION DEMONSTRATED: A new supply was provided on 10/21/2011 with an expirtion date of 8/2015 and the inventory sheet was modified to reflect the ability to check any items with expiration dates.

c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.6 Maryland State Field Monitoring Team B

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: 4.a.1.

ISSUE NO.: 11-11-4a1-A-02

CRITERION: Field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates.

CONDITION: State Field Monitoring Team B had a supply of silver zeolite cartridges with an expiration date of 12/2010. The entire stock in storage had expired.

POSSIBLE CAUSE: Maryland Department of the Environment (MDE) procedures do not contain a trigger mechanism to determine whether the silver zeolite cartridges have expired, only to determine that cartridges are in the inventory supply.

REFERENCE: NUREG-0654, H.10., I.8., 9., 11.

EFFECT: No effect during the exercise as charcoal cartridges were used. However, use of expired cartridges could have decreased the efficiency of radioiodine

collection and may have led to an incorrect radiological assessment by MDE.

CORRECTIVE ACTION DEMONSTRATED: A new supply was provided on 10/21/2011 with an expirtion date of 8/2015 and the inventory sheet was modified to reflect the ability to check any items with expiration dates.

c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2 Risk Jurisdictions

3.3.2.1 Calvert County Emergency Operations Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. 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.d.1, 3.d.2, 4.a.2, 5.a.1, 5.a.3, 5.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: 4.a.2.

ISSUE NO.: 11-11-4a2-A-03

CRITERION: Field teams are managed to obtain sufficient information to help characterize the release and to control radiation exposure.

CONDITION: The Environmental Health Director in the Calvert County Emergency Operations Center (EOC) did not provide the Calvert County Field Monitoring Team (FMT) with all of the necessary information required to control its radiation exposure, including updated meteorological data (wind speed, the stability class, and weather conditions) and when a release was in progress.

POSSIBLE CAUSE: Lack of detailed procedures or a checklist of items to cover during the FMT briefings and on-going communications.

REFERENCE: NUREG-0654, I.8., 11., J.10.a

EFFECT: The FMT was unaware that a release was in progress and of its movement until they identified the plume at sampling point 5. They identified readings with 3 mR/hr closed window and 4 mR/hr open window. The FMT could have received more dose than necessary by inadvertently entering the plume.

CORRECTIVE ACTION DEMONSTRATED: A briefing and communications checklist/notebook for the Environmental Health Director was developed to be utilized with the FMTs. The checklist covers detailed meteorological data, plant status updates, Emergency Classification Levels, start of a radiological release, predicted plume location and direction. The checklist will be used used for an initial briefing and all subsequent communications while the team is in the field.

c. DEFICIENCY: None

d. PLAN ISSUES: 3.a.1, 3.c.1.

ISSUE NO.: 11-11-3a1-P-01

CRITERION: OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers IAW plans and procedures. Emergency workers periodically and at the end of each mission read and record dosimeter readings.

CONDITION: The Radiological Officer did not have information in the Calvert County Radiological Emergency plan to brief the emergency workers on response protocol and turn back value increases due to life safety response.

POSSIBLE CAUSE: The Calvert County Radiological Emergency Plan Sections 4-2 and 4-3 are not clear as to the procedures for increasing worker exposure and assuming life safety duties with regard to increased exposure levels and the Radiological Officer's checklist does not have a list that aligns with the plan.

REFERENCE: NUREG-0654, K.3

EFFECT: The radiological officer did not have adequate information to brief field

teams on response to a life-saving emergency. If the emergency workers had followed the directions given by the Radiological Officer, they would not have been able to immediately respond to a Life Safety emergency. The Calvert County Radiological Emergency Plan does not give the Radiological Officer sufficient information in this area to use in the Emergency Worker Briefing on what to do and what the approval process is for them in the event they need to assume those duties in the field.

CORRECTIVE ACTION DEMONSTRATED: The Calvert County Radiological Emergency Plan sections 4-2 and 4-3 have been revised to fully explain the approval procedures for increasing worker exposure and the checklist for the Emergency Worker Brief was updated to reflect that guidance.

ISSUE NO.: 11-11-3c1-P-02

CRITERION: Protective action decisions are implemented for special populations other than schools within areas subject to protective actions.

CONDITION: The Calvert County Radiological Emergency Plan does not describe the protective action procedures for special populations. The plan merely states that the public will be asked to aid neighbors who are handicapped, impaired, or with special needs requiring special attention.

POSSIBLE CAUSE: The Calvert County Radiological Emergency Plan does not contain a full description of the county's process for addressing special populations.

REFERENCE: NUREG-0654, E.7., J.9., 10.c.d.e.g

EFFECT: In a real event, the public may not be able to aid neighbors who are handicapped, impaired, or with special needs requiring special attention.

RECOMMENDATION: The county plan needs to describe the procedures for utilizing designated transportation resources to transport special needs individuals residing in the emergency planning zone in Section 2.0, Special Concerns.

ISSUE NO.: 11-11-3c1-P-03

CRITERION: Protective action decisions are implemented for special populations other than schools within areas subject to protective actions.

CONDITION: The Calvert County Radiological Emergency Plan includes inconsistent references to the number of residents at nursing homes. There is a discrepancy among Section 2.0, Special Concerns, Table 1-8, Evacuation Time Estimate, and Table 1-6, Evacuation Time Estimate Table.

POSSIBLE CAUSE: The county is utilizing "current" numbers rather than facility capacity.

REFERENCE: NUREG-0654, E.7., J.9., 10.c.d.e.g

EFFECT: Listing of actual residents in a plan will be difficult to maintain in a current status. This could lead to inaccurate information at the time of an emergency and affect the resources necesary to evacuate a facility.

RECOMMENDATION: The Calvert County Radiological Emergency Plan should be updated and simply list the total capacity of nursing homes in Section 2.0 Special Concerns, Table 1-8, Evacuation Time Estimate and Table 1-6, Evacuation Time Estimate Table.

e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.2 Calvert County Field Monitoring Team

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: None

c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.3 Calvert County Back-up Route Alerting

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 5.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: 5.a.3.

ISSUE NO.: 11-11-5a3-A-04

CRITERION: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. Backup alert and notification of the public is completed within 45 minutes following the detection by the ORO of a failure of the primary alert and notification system.

CONDITION: Back-up route alerting was not accomplished within the allotted time.

POSSIBLE CAUSE: Calvert County utilizes five (5) staging areas for back-up route alerting teams. The staging area chosen for the demonstration was the Calvert County Fairgrounds. The correct staging area for the siren that failed was approximately 5 miles to the south with a travel time of nine (9) minutes.
The travel time needed to begin the route alerting resulted in the inability to complete the route in the allotted 45 minutes.

REFERENCE: NUREG E.6 and Appendix 3.b.2.c

EFFECT: If Calvert County does not populate every staging area in an event at Calvert Cliffs Nuclear Power Plant and a siren should fail the public would not be alerted and notified in a timely manner.

CORRECTIVE ACTION DEMONSTRATED: A re-demonstration of the criterion

was accomplished within the 45 minute timeframe when starting from the proper staging area.

c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.4 Calvert County Traffic and Access Control

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1, 3.d.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.5 Calvert County Emergency Worker Monitoring and Decontamination Station, Safford Landfill

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 3.b.1, 6.a.1, 6.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.6 Calvert County Reception Center, Huntington High School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.d.1, 1.e.1, 3.a.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.7 Calvert County Monitoring and Decontamination Center, Huntington High School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 3.b.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.8 Calvert County Congregate Care Center, Huntington High School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 6.c.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.9 Dorchester County Emergency Operations Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.c.1, 1.d.1, 2.a.1, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.d.1, 3.d.2, 4.a.2, 5.a.1, 5.a.3, 5.b.1.

b. AREAS REQUIRING CORRECTIVE ACTION: 1.c.1, 2.a.1, 3.a.1, 4.a.2, 5.a.3, 5.b.1.

ISSUE NO.: 11-11-1c1-A-05

CRITERION: Key personnel with functional roles for the ORO provide direction and control to that part of the overall response effort for which they are responsible.

CONDITION: During the exercise, adequate direction and control was not demonstrated at the Dorchester County Emergency Operations Center (EOC), as evidenced by:

• The notification of an Alert Emergency Classification Level (ECL) was received in the EOC at 0824. Upon arrival in the EOC, the staff was not briefed until 1002, and plant condition status was not provided until requested by EOC staff.

• As subsequent ECL notifications were received, the information was read to EOC staff; however, no updates from the staff were requested until the 1340 briefing.

• There was little to no interaction among the EOC staff. Occasionally, information was shared between individual staff members, but there was no collective sharing of information in the EOC.

When calls came in over the dedicated line from CCNPP, the noise level in the EOC made it very difficult for the call taker to hear the information. Because of this noise, when the General Emergency ECL notification came in, EOC leadership was unaware of the call. The call taker assumed that the message was heard and did not inform EOC leaders that the call was in progress. After 12 minutes, the call taker was asked if the EOC had received an update, and when informed that they had, the County joined the conference call with the other OROs.

The Emergency Alert System (EAS) message was sent out by Calvert County on behalf of Dorchester County; however, Dorchester County did not review the message after it was broadcast.

Overall, there was very little teamwork in the EOC and while plans were available to each member of the EOC, not all members followed procedures.

POSSIBLE CAUSE: EOC leadership was distracted by tasks that should have been delegated to staff members, resulting in a command and control vacuum at the County.

REFERENCE: NUREG-0654 A.1.d , A.2.a

EFFECT: Without proper management of the EOC, key information could be missed and required activity may not be coordinated or occur.

CORRECTIVE ACTION DEMONSTRATED: During the February 7, 2012 drill, the EOC Manager effectively led the staff in responding to a simulated emergency at Calvert Cliffs, including public alert and notification and the implementation of protective actions (as well as radiological exposure control). Coordination of response among the State, counties and utility/plant was demonstrated. The EOC Manager conducted several comprehensive briefings (with the first one occurring shortly after EOC activation), in all cases ensuring a two-way dialogue by requesting each staff member to report-out on their respective activities. Checklists were utilized by the staff throughout the drill, with periodic reminders by the EOC Manager to look ahead, should the emergency escalate. An Incident Status Board was maintained current, throughout the drill. All requirements were properly processed and completed.

ISSUE NO.: 11-11-2a1-A-06

CRITERION: OROs use a decision-making process 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.

CONDITION: Radiation exposure control was inadequately briefed during the radiation safety briefing. Re-demonstration was attempted and unsuccessful.

POSSIBLE CAUSE: The Radiological Officer/Assistant Radiological Officer and the Dorchester County Health Official did not use briefing aids or other reference information during their radiological brief.

REFERENCE: NUREG-0654, J.10.e

EFFECT: The emergency workers were put at risk due to the inadequate administration of emergency worker radiation exposure control.

CORRECTIVE ACTION DEMONSTRATED: This criterion was successfully re-demonstrated in a remedial exercise on February 7, 2012. Radiological exposure control briefings were scripted and standardized. A Dorchester County Health Department representative presented accurate and pertenent information regarding Potassium Iodide: its purposes, side effects, and authorized use. The Dorchester County Radiological Officer provided a thorough and accurate briefing on radiation exposure limits and personal protective measures. All emergency workers were briefed at one time. Information cards were provided to emergency workers with radiological reference material for their use while carrying out field assignments.

ISSUE NO.: 11-11-3a1-A-07

CRITERION: OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers IAW plans and procedures. Emergency workers periodically and at the end of each mission read and record dosimeter readings.

CONDITION: Radiological briefings to Emergency Workers were inconsistent, inaccurate, and unclear.

POSSIBLE CAUSE: Radiological briefings were provided by three separate individuals (the Radiological Officer, the Radiological Assistant, and the County Health Officer). Briefings were inaccurate, inconsistent, and provided incomplete information.

REFERENCE: NUREG-0654, K.3

EFFECT: Emergency Workers' health and safety could be at risk of excessive radiological exposure.

CORRECTIVE ACTION DEMONSTRATED: During a re-demonstration of the Calvert Cliffs Nuclear Power Plant exercise on February 7, 2012, the Dorchester County Radiological Officer conducted a thorough and accurate Radiological Officer's briefing to all Emergency Workers, consisting of Route Alerting Teams and Field Monitoring Teams, shortly after the declaration of Alert. The information was presented utilizing a pre-scripted briefing sheet and read by the Radiological Officer and included the use of dosimetry and survey meters, exposure limits, turn-back values, and documentation of equipment. Each Emergency Worker signed for equipment utilizing the Dorchester County Radiation Exposure Record Dosimetry-KI Report Form, and radiological information cards were attached to each film badge. Information pertaining to the use of and precautions associated with Potassium Iodide (KI) was presented by a certified Dorchester County Health Department official and included ingestion protocols and issue and receipt of (KI).

ISSUE NO.: 11-11-4a2-A-08

CRITERION: Field teams are managed to obtain sufficient information to help characterize the release and to control radiation exposure.

CONDITION: The Dorchester County Emergency Operations Center did not manage its Field Monitoring Team to obtain sufficient information to help characterize the release and to control radiation exposure.

POSSIBLE CAUSE: The Dorchester County Field Monitoring Team did not receive situational updates. The team was never informed that a General Emergency had been declared or that there was a radiation leak in progress.

REFERENCE: NUREG-0654, I.8, 11, J.10.a

EFFECT: The Field Monitoring Team did not have good situational awareness. Lack of knowledge concerning current plant and plume status could put the team at risk of receiving avoidable exposure to radiation.

CORRECTIVE ACTION DEMONSTRATED: During a re-demonstration of the Calvert Cliffs Nuclear Power Plant exercise on February 7, 2012, the Dorchester County Field Monitoring Teams 1 and 2 were provided with current, updated plant information which included plant status, weather conditions, and radiological data related to the plume during a simulated incident at the plant. All information was transmitted timely via hand held radios, and documented by the Field Team Coordinator.

ISSUE NO.: 11-11-5a3-A-09

CRITERION: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. Backup alert and notification of the public is completed within 45 minutes following the detection by the ORO of a failure of the primary alert and notification system.

CONDITION: upon siren failure Route Alerting was not completed within the allotted 45 minutes .

POSSIBLE CAUSE: Route Alerting personnel were not readily available to be dispatched.

REFERENCE: NUREG-0654 E.6, 3.B.2.c

EFFECT: Route Alerting was not completed in the required time.

CORRECTIVE ACTION DEMONSTRATED: During the redemonstration on February 7, 2012, upon becoming aware of a simulated siren failure (#36) at 1141, the EOC Manager immediately informed (within one minute) the Maryland State Police representative to the County EOC. Once the MSP representative, in consultation with County Sheriff and City of Cambridge Police Department representatives, determined the impacted route associated with siren #36, radio contact was made with the MSP individual in the field, directing him to commence route alerting; the communication occurred about 1146. Upon completion of the route alerting at 1223, the MSP officer informed the EOC.

ISSUE NO.: 11-11-5b1-A-10

CRITERION: OROs provide accurate emergency information and instructions to the public and the news media in a timely manner.

CONDITION: The Media Briefing conducted by the Emergency Management Coordinator was incomplete and essential information for the media was not provided.

POSSIBLE CAUSE: The Emergency Management Coordinator was not aware a Media Briefing needed to be observed and was not prepared to conduct a briefing.

REFERENCE: NUREG-0654, E.5, 7; G.3.a; G.4.a, b, c

EFFECT: Essential information about emergency operations and activities to protect the public would not have been disseminated.

CORRECTIVE ACTION DEMONSTRATED: This criterion was successfully re-demonstrated during a remedial exercise conducted on February 7, 2012. A media briefing was presented by the Dorchester County Public Information Officer (DCPIO) with the Emergency Operations Center Coordinator and the Emergency

Services Director in attendance. The DCPIO read a statement from a script that included 1) the name and title of the PIO, 2) the releasing authority for the release, 3) a general description of the situation, 4) response activities in progress and protective action decisions, and 5) how to receive additional incormation from the JIC, MEMA, and the Internet.

c. DEFICIENCY: None

d. PLAN ISSUES: 1.e.1.

ISSUE NO.: 11-1-1-1e1-P-04

CRITERION: Equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operations.

CONDITION: According to the Dorchester County Radiological Emergency Plan, Attachment 3, Tab C, Radiological Equipment Listing, "Calibration of equipment is performed quarterly by EMA staff. Records of this calibration are on file at the EOC." However, Dorchester County does not have the facilities to perform instrument calibrations.

POSSIBLE CAUSE: Unfamiliarity with ANSI standards for radiological equipment calibration.

REFERENCE: NUREG-0654, F.1, 2

EFFECT: The plan is incorrect and requires unrealistic and unnecessary calibration of instruments.

RECOMMENDATION: Dorchester County Emergency Management should modify its plan to indicate that the radiological monitoring devices are calibrated annually in accordance with ANSI standards and that direct reading dosimeters are "leak tested" quarterly; also that records of calibration and leak testing are on file in the Emergency Management office.

e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.10 Dorchester County Field Monitoring Team

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.11 Dorchester County Back-up Route Alerting

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 5.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: 3.a.1, 5.a.3.

ISSUE NO.: 11-11-3a1-A-11

CRITERION: OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers IAW plans and procedures. Emergency workers periodically and at the end of each mission read and record dosimeter readings.

CONDITION: Officer dispatched to conduct Back-up Route Alerting was inadequately briefed on dosimetry and exposure control procedures and therefore did not understand the proper use of dosimetry and did not check the reading during the route.

POSSIBLE CAUSE: The assistant radiation officer was delegated to conduct the briefing and did not refer to the Dorchester County Radiological Emergency Plan or procedural checklists in order to provide complete instructions to the Back-up Route

Alerting officer.

REFERENCE: NUREG-0654, K.3

EFFECT: The Back-up Route Alerting officer did not understand the dosimetry equipment. He did not check dosimetry while driving the route.

CORRECTIVE ACTION DEMONSTRATED: During the February 7, 2012, re-demonstration the Back-up Route Alerting officer was adequately briefed at the Dorchester County EOC and was interviewed during the route and was determined to be knowledgeable about his dosimetry equipment and radiological limits. He frequently checked his dosimetry while driving the route and refered to the information printed on a laminated 3x5 card provided by the radiological officer during the briefing at the Dorchester County EOC.

ISSUE NO.: 11-11-5a3-A-12

CRITERION: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. Backup alert and notification of the public is completed within 45 minutes following the detection by the ORO of a failure of the primary alert and notification system.

CONDITION: The Back-up Route Alerting was not completed within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation.

POSSIBLE CAUSE: The law enforcement staff at the Dorchester County Emergency Operations Center (EOC) was not aware of the need to demonstrate back-up route alerting. When informed of the siren failure, it took 14 minutes to choose the appropriate route, request an officer and for the officer to arrive at the EOC. Briefing the officer on the route, issuing dosimetry and KI took an additional six minutes. This left the officer 25 minutes to reach and drive the selected route.

REFERENCE: NUREG-0654, E.6., Appendix 3.B.2.c

EFFECT: Shelter in place instructions would not have been delivered to the population along the specified route in a timely manner resulting in possible exposure to radiation.

CORRECTIVE ACTION DEMONSTRATED: Route alerting was re-demonstrated and was successfully completed within thirty nine minutes.

c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.12 Dorchester County Traffic and Access Control

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1, 3.d.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.13 Dorchester County Reception Center, Dorchester County Career and Technology Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.b.1, 1.e.1, 3.a.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None

e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.14 Dorchester County Monitoring and Decontamination Center, Dorchester County Career and Technology Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.b.1, 1.e.1, 3.a.1, 3.b.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.15 Dorchester County Congregate Care Center, Dorchester County Career and Technology Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.b.1, 1.e.1, 6.c.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.16 Dorchester County Emergency Worker Monitoring and Decontamination Station, Dorchester County Career and Technology Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.b.1, 1.e.1, 3.a.1, 3.b.1, 6.a.1, 6.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None

d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.17 St. Mary's County Emergency Operations Center

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. 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.d.1, 3.d.2, 4.a.2, 5.a.1, 5.a.3, 5.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.18 St. Mary's County Field Monitoring Team

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.d.1, 1.e.1, 3.a.1, 3.b.1, 4.a.1, 4.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.19 St. Mary's County Back-up Route Alerting

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 5.a.3.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None

e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.20 St. Mary's County Traffic and Access Control

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.a.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.d.1, 3.d.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.21 St. Mary's County Reception Center, Leonardtown High/Middle School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.d.1, 1.e.1, 3.a.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.22 St. Mary's County Emergency Worker Monitoring and Decontamination Station, Leonardtown High/Middle School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 3.b.1, 6.a.1, 6.b.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None

f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.23 St. Mary's County Monitoring and Decontamination Center, Leonardtown High School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 3.a.1, 3.b.1, 6.a.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.24 St. Mary's County Congregate Care Center, Leonardtown High/Middle School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.e.1, 6.c.1.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.25 Calvert County Public Schools, Dowell Elementary School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 3.c.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None

g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.26 Calvert County Public Schools, Mutual Elementary School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 3.c.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.27 Calvert County Public Schools, Patuxent High School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 3.c.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.28 St. Mary's Public Schools, Hollywood Elementary School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 3.c.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.29 St. Mary's Public Schools, Town Creek Elementary School

In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 3.c.2.
b. AREAS REQUIRING CORRECTIVE ACTION: None
c. DEFICIENCY: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

SECTION 4: CONCLUSION

As previously stated, the State and local emergency management organizations displayed a knowledge of their emergency plans and procdures and adequately implemented them, thereby demonstrating reasonable assurance that those agencies can respond and protect the health, lives, and property of the residents of the BVPS Emergenccy Planning Zone.

APPENDIX A: IMPROVEMENT PLAN

Issue Number: 11-11-3c1-P-02	Criterion: 3c1
ISSUE: The Calvert County Radiological Emergency Plan does not describe the protective action procedures for special populations. The plan merely states that the public will be asked to aid neighbors who are handicapped, impaired, or with special needs requiring special attention.	
RECOMMENDATION: The county plan needs to describe the procedures for utilizing designated transportation resources to transport special needs individuals residing in the emergency planning zone in Section 2.0, Special Concerns.	
CORRECTIVE ACTION DESCRIPTION:	
CAPABILITY:	PRIMARY RESPONSIBLE AGENCY:
CAPABILITY ELEMENT:	START DATE:
AGENCY POC:	ESTIMATED COMPLETION DATE:

Issue Number: 11-11-3c1-P-03	Criterion: 3c1
ISSUE: The Calvert County Radiological Emergency Plan includes inconsistent references to the number of residents at nursing homes. There is a discrepancy among Section 2.0, Special Concerns, Table 1-8, Evacuation Time Estimate, and Table 1-6, Evacuation Time Estimate Table.	
RECOMMENDATION: The Calvert County Radiological Emergency Plan should be updated and simply list the total capacity of nursing homes in Section 2.0 Special Concerns, Table 1-8, Evacuation Time Estimate and Table 1-6, Evacuation Time Estimate Table.	
CORRECTIVE ACTION DESCRIPTION:	
CAPABILITY:	PRIMARY RESPONSIBLE AGENCY:
CAPABILITY ELEMENT:	START DATE:
AGENCY POC:	ESTIMATED COMPLETION DATE:

Issue Number: 11-11-1e1-P-04	**Criterion: 1e1**
ISSUE: According to the Dorchester County Radiological Emergency Plan, Attachment 3, Tab C, Radiological Equipment Listing, "Calibration of equipment is performed quarterly by EMA staff. Records of this calibration are on file at the EOC." However, Dorchester County does not have the facilities to perform instrument calibrations.	
RECOMMENDATION: Dorchester County Emergency Management should modify its plan to indicate that the radiological monitoring devices are calibrated annually in accordance with ANSI standards and that direct reading dosimeters are "leak tested" quarterly; also that records of calibration and leak testing are on file in the Emergency Management office.	
CORRECTIVE ACTION DESCRIPTION:	
CAPABILITY:	PRIMARY RESPONSIBLE AGENCY:
CAPABILITY ELEMENT:	START DATE:
AGENCY POC:	ESTIMATED COMPLETION DATE:

APPENDIX B: EXERCISE TIMELINE

Table 1 - Exercise Timeline
DATE: 2011-10-18; SITE: Calvert Cliffs Nuclear Power Plant, MD

Emergency Classification Level or Event	Time Utility Declared	MD EOC	MD AAC MDE	MDACC EOF Brstw	MD JIC Brstw	CalCoEOC	DoCo EOC
Unusual Event	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alert	0815	0825	0824	0817	0825	0824	0824
Site Area Emergency	1035	1047	1039	1037	1046	1040	1040
General Emergency	1212	1222	1215	1212	1221	1216	1215
Simulated Rad. Release Started	1318	1330	1320	1318	1328	1328	1324
Simulated Rad. Release Terminated	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Facility Declared Operational		1011	0900	1203	0926	0854	1008
Declaration of State of Emergency: State		1420	N/A	1426	1426	1426	1426
Declaration of State of Emergency: Local		N/A	N/A	N/A	N/A	1051	1300
Exercise Terminated		1416	1400	1445	1430	1430	1420
Early Precautionary Actions: Shelter Livestock and Poultry		1105	1105	1107	1118	1105	1105
Early Precautionary Actions: Relocate Risk Schools		1107	1107	1107	1107	1107	1107
Early Precautionary Actions: Close Parks and Recreation Areas		1107	1107	1107	1107	1109	1108
1st Protective Action Decision: Evacuate/Shelter in Place		1247	N/A	1247	1320	1247	1247
1st Siren Activation		1257	N/A	N/A	N/A	1257	1257
1st EAS or EBS Message		1300	N/A	N/A	N/A	1300	1300
KI Administration Decision: Emergency Workers		1105	1105	1105	1105	1105	1105
KI Administration Decision: General Public		1247	1247	1247	1247	1247	1247

Table 1 - Exercise Timeline

DATE: 2011-10-18, SITE: Calvert Cliffs Nuclear Power Plant, MD

Emergency Classification Level or Event	Time Utility Declared	SMCo EOC
Unusual Event	N/A	N/A
Alert	0815	0826
Site Area Emergency	1035	1041
General Emergency	1212	1215
Simulated Rad. Release Started	1318	1318
Simulated Rad. Release Terminated	N/A	N/A
Facility Declared Operational		0856
Declaration of State of Emergency: State		1426
Declaration of State of Emergency: Local		1250
Exercise Terminated		1413
Early Precautionary Actions: Shelter Livestock and Poultry		1105
Early Precautionary Actions: Relocate Risk Schools		1107
Early Precautionary Actions: Close Parks and Recreation Areas		1107
1st Protective Action Decision: Evacuate/Shelter in Place		1247
1st Siren Activation		1257
1st EAS or EBS Message		1300
KI Administration Decision: Emergency Workers		1105
KI Administration Decision: General Public		1247

APPENDIX C: EXERCISE EVALUATORS AND TEAM LEADERS

The following is the list of Evaluators and Team Leaders for the CCNPP 2011 out of sequence evaluations held during the week of July 11, 2011 and the Plume Exercise evaluated the week of October 18, 2011. The following individuals made up the evaluation team for those evaluations:

Darrell Hammons, DHS, Radiological Assistance Committee Chairperson
Robert Neff, DHS, Exercise Evaluation Program Manager and Site Specialist, Out of Sequence Evaluations
John Price, DHS, Team Leader, Maryland EOC
Martin Vyenielo, DHS, Team Leader, Technical Evaluations
Richard Kinard, DHS, Team Leader, Calvert County EOC
Joseph Suders, DHS, Team Leader, St. Mary's County EOC
Barton Freeman, DHS, Team Leader, Dorchester County Emergency Operations Center
Lisa Hamilton, DHS, Team Leader, Schools
Tina Thomas, DHS, Calvert County EOC
Dan Lerch, DHS, St. Mary's County EOC
Lee Torres, DHS, Dorchester County EOC
Mike Shuler, DHS, EOF Barstow
Matt Wiedemer, DHS, Dorchester County EOC

Re-demonstrations were held on January 27, 2012, at the Calvert County Emergency Operations Center and on February 7, 2012, at the Dorchester County Emergency Operations Center. The following constitutes the managing staff for those re-demonstration evaluations:

Robert Neff, DHS, Exercise Evaluation Program Manager and Site Specialist, Calvert County EOC and Dorchester County EOC
Richard Kinard, DHS, Dorchester County EOC
Joseph Suders, DHS, Dorchester County EOC
Barton Freeman, DHS, Dorchester County EOC

Additional evaluation assistance was provided by numerous FEMA Regions and ICF Consulting. The following individuals represent the rest of the evaluation team:

Ingrid Bruns, Region I	Brian Kennedy, Region I	Helen Laforge, Region I
Karl Rabenhorst, Region V	Darren Bates, Region V	Clint Crackel, Region V
Carolyn Sturghill, Region V	Tim Pfliger, Region VI	Elena Joyner,Region IX
Bill Webb, Region X	Johanna Berkey, Region X	Janet Hlavaty-LaPosa, Region X
Larry Broockerd, FEMA Hq	Bridget Ahlgrim, FEMA Hq	Mike Howe, FEMA Hq
Roger Kowieski, ICF	Reggie Rodgers, ICF	Alan Bevan, ICF
Jill Leatherman, ICF		

DATE: 2011-10-18, SITE: Calvert Cliffs Nuclear Power Plant, MD

LOCATION	EVALUATOR	AGENCY
Maryland Emergency Operations Center	Don Carlton Helen LaForge *John Price Karl Rabenhorst	FEMA RI FEMA RI FEMA RIII FEMA RV
Maryland Accident Assessment Center, Maryland Department of the Environment	Reggie Rodgers	ICFI
Maryland State Accident Assessment Center, Emergency Operations Facility Barstow	Michael Shuler *Martin Vyenielo	FEMA RIII FEMA RIII
Maryland Joint Information Center, Barstow	Roger Kowieski	ICFI
Maryland State Field Monitoring Team A	Timothy Pflieger	FEMA RVI
Maryland State Field Monitoring Team B	Alan Bevan	ICFI
Calvert County Emergency Operations Center	Kerris Bates Ingrid Bruns *Richard Kinard Tina Lai-Thomas Bill Webb	FEMA RV FEMA RI FEMA RIII FEMA RIII FEMA RX
Calvert County Field Monitoring Team	Johanna Berkey	FEMA RX
Calvert County Back-up Route Alerting	Larry Broockerd	FEMA HQ
Calvert County Traffic and Access Control	Kerris Bates	FEMA RV
Calvert County Emergency Worker Monitoring and Decontamination Station, Safford Landfill	*Robert Neff	FEMA RIII
Calvert County Reception Center, Huntington High School	*Robert Neff	FEMA RIII
Calvert County Monitoring and Decontamination Center, Huntington High School	*Robert Neff	FEMA RIII
Calvert County Congregate Care Center, Huntington High School	*Robert Neff	FEMA RIII
Dorchester County Emergency Operations Center	Bridget Ahlgrim *Barton Freeman Lee Torres Matthew Wiedemer	FEMA HQ FEMA RIII FEMA RIII FEMA RIII
Dorchester County Field Monitoring Team	Michael Howe	FEMA HQ
Dorchester County Back-up Route Alerting	Janet Hlavaty-LaPosa	FEMA RX
Dorchester County Traffic and Access Control	Carolyn Sturghill	FEMA RV
Dorchester County Reception Center, Dorchester County Career and Technology Center	*Robert Neff	FEMA RIII
Dorchester County Monitoring and Decontamination Center, Dorchester County Career and Technology Center	*Robert Neff	FEMA RIII
Dorchester County Congregate Care Center, Dorchester County Career and Technology Center	*Robert Neff	FEMA RIII
Dorchester County Emergency Worker Monitoring and Decontamination Station, Dorchester County Career and Technology Center	*Robert Neff	FEMA RIII
St. Mary's County Emergency Operations Center	Clinton Crackel Daniel Lerch *Joseph Suders	FEMA RV FEMA RIII FEMA RIII
St. Mary's County Field Monitoring Team	Jill Leatherman	ICFI
St. Mary's County Back-up Route Alerting	Lisa Hamilton	FEMA HQ
St. Mary's County Traffic and Access Control	Elena Joyner	FEMA RIX
St. Mary's County Reception Center, Leonardtown High/Middle School	*Robert Neff	FEMA RIII

St. Mary's County Emergency Worker Monitoring and Decontamination Station, Leonardtown High/Middle School	*Robert Neff	FEMA RIII
St. Mary's County Monitoring and Decontamination Center, Leonardtown High School	*Robert Neff	FEMA RIII
St. Mary's County Congregate Care Center, Leonardtown High/Middle School	*Robert Neff	FEMA RIII
Calvert County Public Schools, Dowell Elementary School	Carolyn Sturghill	FEMA RV
Calvert County Public Schools, Mutual Elementary School	*Lisa Hamilton	FEMA HQ
Calvert County Public Schools, Patuxent High School	Elena Joyner	FEMA RIX
St. Mary's Public Schools, Hollywood Elementary School	Timothy Pflieger	FEMA RVI
St. Mary's Public Schools, Town Creek Elementary School	Larry Broockerd	FEMA HQ

*Team Leader

APPENDIX D: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
AAC	Accident Assessment Center
ALARA	As Low As Reasonably Achievable
ANSI	Americian National Standards Institute
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARO	Assistant Radiological Officer
CCEOC	Calvert County Emergency Operations Center
CCNPP	Calvert Cliffs Nuclear Power Plant
CCPIO	Calvert County Public Information Officer
CEG	Constellation Energy Group
DC	Dorchester County
DCFMT	Dorchester County Field Monitoring Team
EAL	Emergency Action Level
EAS	Emergency Alerting System
ECL	Emergency Classification Level
EM	Emergency Manager
EMC	Emergency Management Coordinator
EMD	Emergency Management Director
EO	Environmental Officer
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPD	Electronic Personal Dosimeter
EPZ	Emergency Planning Zone
ERC	Emergency Response Coordinator
ERD	Emergency Response Director
ESF	Emergency Support Function
EW	Emergency Worker
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
FMTL	Field Monitoring Team Leader
FTL	Field Team Leader
GE	General Emergency
JIC	Joint Information Center
MEMA	Maryland Emergency Management Agency

MJOC	Maryland Joint Operations Center
MSP	Maryland State Police
NIMS	National Incident Management System
NRC	Nuclear Regulatory Commission
ORO	Offsite Response Organization
OSL	Optically Stimulated Luminescence
PAD	Protective Action Decision
PAR	Protection Action Recommendation
PAZ	Protective Action Zones
PIO	Public Information Officer
PPE	Personal Protective Equipment
PRD	Permanent Record Dosimeter
RAC	Radiological Assistance Committee
RAD	Radiological Assessment Director
RDO	Radiological Defense Officer
REP	Radiological Emergency Preparedness
RHP	Radiation Health Protection
RO	Radiological Officer
RSO	Radiation Safety Officer
SAE	Site Area Emergency
SEOC	State Emergency Operations Center
SHA	State Highway Administration
SJIC	State Joint Information Center
TCP	Traffic Control Point
TEDE	Total Effective Dose Equivalent
UE	Unusual Event

APPENDIX E: EXERCISE PLAN

The enclosed Exercise Plan was created as an overall tool for facilitation and implementation of the CALVEX 2011 Plume Exercise and to integrate the concepts and policies of the Homeland Security Exercise Evaluation Program with the Radiological Emergency Preparedness Program Exercise Methodology. The Exercise Plan was originally drafted and published by the Maryland Emergency Management Agency (MEMA) as an independent document and is annexed here.

The "Calvert Cliffs Nuclear Power Plant Extent of Play 2011 Radiological Emergency Preparedness Exercise" was negotiated and agreed upon by FEMA Region III, MEMA, and the Emergency Management agencies of the Risk Counties. It is included as an Appendix of the Exercise Plan.

NATIONAL EXERCISE PROGRAM

Exercise Plan

STATE OF MARYLAND / CALVEX 2011
FEMA EVALUATED REP EXERCISE

U.S. DEPARTMENT OF HOMELAND SECURITY

FEMA

EXERCISE DATE: 10/18/2011 EXPLAN PUBLISHING DATE: 07/04/2011

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PREFACE

The CALVEX 2011 Evaluated Full Scale Exercise (FSE) is sponsored by the Maryland Emergency Management Agency (MEMA). This Exercise Plan (ExPlan) was produced with input, advice, and assistance from the Exercise Planning Team (EPT), which followed the guidance set forth in the Federal Emergency Management Agency (FEMA), Homeland Security Exercise and Evaluation Program (HSEEP).

The ExPlan gives officials, observers, media personnel, and players from participating organizations the information necessary to observe or participate in a nuclear power plant accident response exercise focusing on participants' emergency response plans, policies, and procedures as they pertain to this type of event. The information in this document is current as of the date of publication and is subject to change as dictated by the EPT.

The CALVEX 2011 is an *unclassified exercise*. The control of information is based more on public sensitivity regarding the nature of the exercise than on the actual exercise content. Some exercise material is intended for the exclusive use of exercise planners, Controllers, and Evaluators, but Players may view other materials deemed necessary to their performance. The ExPlan may be viewed by all exercise participants, *but the Controller and Evaluator (C/E) Handbook is a restricted document intended for Controllers and Evaluators only.*

All exercise participants should use appropriate guidelines to ensure the proper control of information within their areas of expertise and to protect this material in accordance with current jurisdictional directives. Public release of exercise materials to third parties is at the discretion of DHS and the EPT.

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Radiological Emergency Preparedness (REP)/ Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

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Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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CHAPTER 1: GENERAL INFORMATION

Introduction

The CALVEX 2011 is a full-scale exercise (FSE) designed to establish a learning environment for players to exercise emergency response plans, policies, and procedures as they pertain to Nuclear Power Plant accidents. An FSE is a complex event that requires detailed planning. To conduct an effective exercise, subject matter experts (SMEs) and local representatives from numerous agencies have taken part in the planning process and will take part in exercise conduct and evaluation.

This Exercise Plan (ExPlan) was produced at the direction of the Maryland Emergency Management Agency and Calvert Cliffs Nuclear Power Plant with the input, advice, and assistance of the EPT. The CALVEX 2011 is evidence of the growing partnership between Private, State and local jurisdictions for response to the threats our Nation and communities face.

Confidentiality

The CALVEX 2011 is an *unclassified exercise*. The control of information is based more on public sensitivity regarding the nature of the exercise than on the actual exercise content. Some exercise material is intended for the exclusive use of exercise planners, controllers, and evaluators, but players may view other materials deemed necessary to their performance. This ExPlan may be viewed by all exercise participants, *but the Controller and Evaluator (C/E) Handbook is a restricted document intended for controllers and evaluators only.*

All exercise participants should use appropriate guidelines to ensure the proper control of information within their areas of expertise and protect this material in accordance with current MEMA directives.

Public release of exercise materials to third parties is at the discretion of the Federal Emergency Management Agency (FEMA) and the EPT.

Purpose

The purpose of this exercise is to evaluate player actions against current response plans and capabilities for a nuclear power plant-related incident, and to comply with the requirements of 44 CFR 350 and the guidelines of NUREG 0654/FEMA-REP-1. Exercise planners utilized the elements described in the 67 FR 20580 (April 25, 2002) and Interim Radiological Emergency Preparedness (REP) Program Manual (August 2002) to develop this exercise.

The objective of CCNPP, Maryland State and rick county agencies is to demonstrate reasonable assurance that the public can be protected during a nuclear power plant emergency.

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Target Capabilities

The establishment of the National Preparedness Priorities have steered the focus of homeland security toward a capabilities-based planning approach. Capabilities-based planning focuses on planning under uncertainty, since the next danger or disaster can never be forecast with complete accuracy. Therefore, capabilities-based planning takes an all-hazards approach to planning and preparation which builds capabilities that can be applied to a wide variety of incidents. States and Urban Areas use capabilities-based planning to identify a baseline assessment of their homeland security efforts by comparing their current capabilities against the Target Capabilities List (TCL) and the critical tasks of the Universal Task List (UTL). This approach identifies gaps in current capabilities and focuses efforts on identifying and developing priority capabilities and tasks for the jurisdiction. These priority capabilities are articulated in the jurisdiction's homeland security strategy and Multi-Year Training and Exercise Plan (TEP), of which this exercise is a component of.

The capabilities listed below have been selected by the EPT planning team from the priority capabilities identified in Maryland Multi-Year TEP. These capabilities provide the foundation for development of the exercise objectives and scenario, as the purpose of this exercise is to measure and validate performance of these capabilities and their associated critical tasks.

Common Target Capabilities

Planning
Communications
Risk Management

Prevent Mission Area Target Capabilities

Information Gathering and Recognition of Indicators and Warnings
Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE) Detection

Respond Mission Area Target Capabilities

On-Site Incident Management
Emergency Operations Center (EOC) Management
Critical Resource Logistics and Distribution
Responder Safety and Health
Environmental Health
Citizen Evacuation and Shelter-in-Place
Emergency Public Information and Warning
Mass Care (Sheltering, Feeding, and Related Services)

Exercise Objectives

The EPT selected objectives that focus on evaluating emergency response procedures, identifying areas for improvement, and achieving a collaborative attitude. The CALVEX exercise objectives and extent of play have been submitted in a separate document.

Outstanding Issues

There are no Areas Requiring Corrective Action (ARCAs) as a result of the previous FEMA-evaluated CALVEX exercise at CCNPP in October 20, 2009. One planning issue was identified.

Issue Number: 11-09-2.e.1-P-01

Condition: There are several instances in MDE procedures where the use of occupational dose limits (5 rem/year TEDE) in accordance with *Manual of Protective Actions of Protective Action Guides and Protective Actions for Nuclear Incidents*, EPA-400-R-92-00 during the intermediate phase of the response is not clearly described. For example, in MDE EP-306, *Protective Action Recommendation for Ingestion Pathway/Recovery/Reentry Phase*, Rev. 4, Attachment 4 includes discussion of doses up to and exceeding 25 rem for life-saving missions. It is unclear why authorization of doses exceeding 5 rem TEDE would be required during the intermediate phase. Additionally, the note on page 4 of MDE EP-307, *Protective Action Recommendation for Ingestion Pathway/Recovery/Reentry Phase*, indicates that "individuals permitted to reenter a restricted zone should not exceed 5 rem/year CDE", when the occupational dose limits are given as TEDE.

Possible Cause: Plans may not have been written with an appropriate emphasis on the difference between the use of emergency dose limits during the early (emergency) phase and occupational dose limits during the intermediate and late phases.

Reference: NUREG-0654/FEMA REP-1, Rev. 1, Criterion M.1

Effect: Personnel may not understand that different dose limits apply during the early emergency phase and during the intermediate/late phases, and need to managed and tracked independently.

Recommendation: The Maryland plans MDE procedures should be revised to clarify that different dose limits apply during the early emergency phase and the intermediate/late phases.

State Response: The Maryland procedures will be reviewed and revised as appropriate to clarify dose limits that apply during the early emergency phase and the intermediate/late phases (i.e. emergency exposure limits vs. occupational exposure limits)

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CHAPTER 2: EXERCISE LOGISTICS

Exercise Summary

General

The CALVEX 2011 is designed to establish a learning environment for players to exercise their plans and procedures for responding to a terrorist incident. The CALVEX 2011 will be conducted on September 13, 2011. Exercise play is scheduled for about 8 hours or until the lead offsite controller determines that the exercise objectives have been met at each venue.

Assumptions

To create an exercise scenario, equipment malfunctions are required to facilitate the simulated accident.

Due to designed reliability and redundancy of safety systems, probable equipment malfunctions are difficult to incorporate into a scenario, especially where they are needed to cause plant damage that creates a serious problem to the off-site environment. The scenario contains improbable failures that lead to off-site consequences. The Updated Final Safety Analysis Report provides the analyzed capabilities of plant systems to maintain control over radioactive material within the plant during off-normal plant incidents. Thus, to incorporate malfunctions into a scenario, assumptions must be made which are not consistent with design and analysis data.

Public perception of an exercise scenario may lead to the belief that these events are probable. If the sequence of events presented in this scenario were probable, an Un-reviewed Safety Question would exist and actions would be taken to rectify the situation.

In order to achieve a sequence of events forcing participant emergency response action, the following improbable events have been incorporated in the scenario design:

1. Inadvertent valve operation
2. Multiple tornado strikes
3. Loss of all offsite power
4. Failure of emergency diesel generator
5. Stuck open relief valve
6. Failure of charging pumps
7. Failure of safety injection
8. Failure of Containment spray
9. Failure of Containment cooling
10. Containment hydrogen combustion
11. Failure of air lock seals
12. Containment failure occurs due to the Personnel Airlock gasket degradation and door operating mechanism failure.
13. NUREG 1228 discusses isolation failures on page 4-42. "Isolation failure typically refers to a failure of the isolation valves to go to their required (closed) position. In this (NUREG 1228)

14. assessment, it is assumed that an isolation failure is the result of the failure of the valve seals. In Table 4.10, it is assumed that a failure to isolate is equivalent to 100 % / day leakage. This approximates leakage of purge and vent system isolation valve seals. The metal-to-metal clearance between the valve disk and body is normally between 1/16 and 1/8 in. Therefore, for a 40-inch diameter valve, a total seal failure would correspond to a 6-in2 hole."
15. The containment leak rate in this scenario has no actual physical basis. It is based on a simulator malfunction for a containment leak that is equivalent to 15 % of the containment air volume by weight per day. Using the CHRRM monitoring method given in ERPIP-511, a leak rate was selected for 100% volume per day (6.6 E+5 cc/s). The leak rate corresponds to 1400 cfm and was selected to achieve an offsite dose consequence. The leak is assumed to by-pass the Personnel Airlock double gasket. The leak is able to relieve pressure as it builds for the duration of the scenario. The peak release rate for this scenario is 8.25E+8 uCi/s NG and 3.44E+6 uCi/s I as modeled with the RADDOSE dose assessment model using the WRNGM monitoring method.

Assumptions constitute the implied factual foundation for the exercise and, hence, are assumed to be present before the start of the exercise. The following general assumptions apply to the CALVEX 2011:

- The exercise will be graded against the REP criteria. Elements outside the scope of the REP criteria will not be graded.
- This exercise will be conducted in a no-fault learning environment wherein systems and processes, not individuals, will be evaluated.
- Exercise simulation will be realistic and plausible, containing sufficient detail from which to respond.
- Exercise players will react to the information and situations as they are presented, in the same manner as if this had been a real event.

Constructs and Constraints

Constructs are exercise devices designed to enhance or improve exercise realism. Alternatively, constraints are exercise limitations that may detract from exercise realism. Constraints may be the inadvertent result of a faulty construct or may pertain to financial and staffing issues. Although there are a number of constructs and constraints (also know as exercise artificialities) for any exercise, the EPT recognizes and accepts the following as necessary:

- Exercise communication and coordination will be limited to the participating exercise venues and the simulation cell (SimCell).
- Only those communication methods listed in the Communication Directory will be available for players to use during the exercise.
- Out-of-Sequence play is allowed.
- Certain simulations are allowed and described in the extent of play.

The participating agencies may need to balance exercise play with real-world emergencies. It is understood that real-world emergencies will take priority.

Exercise Participants

The following are the categories of participants involved in this exercise; note that the term "participant" refers to all categories listed below, not just those playing in the exercise:

- *Players.* Players are agency personnel who have an active role in responding to the simulated emergency and perform their regular roles and responsibilities during the exercise. Players initiate actions that will respond to and mitigate the simulated emergency.
- *Controllers.* Controllers set up and operate the exercise site; plan and manage exercise play; act in the roles of response individuals and agencies not playing in the exercise. Controllers direct the pace of exercise play and routinely include members from the exercise planning team. They provide key data to players and may prompt or initiate certain player actions to ensure exercise continuity.
- *Simulators.* Simulators are control staff personnel who role-play as nonparticipating organizations or individuals. They most often operate out of the SimCell, but may occasionally have face-to-face contact with players. Simulators function semi-independently under the supervision of SimCell controllers, enacting roles (e.g., as media reporters or next of kin) in accordance with instructions provided in the Master Scenario Events List (MSEL). All simulators are ultimately accountable to the Exercise Director and Senior Controller.
- *Evaluators.* Evaluators are chosen to evaluate and provide feedback on a designated functional area of the exercise. They are chosen based on their expertise in the functional area(s) they have been assigned to review during the exercise and their familiarity with local emergency response procedures. Evaluators assess and document participants' performance against established emergency plans and exercise evaluation criteria, in accordance with HSEEP standards and within the bounds of REP Program guidance and regulations. They are typically chosen from amongst planning committee members or the agencies/organizations that are participating in the exercise. FEMA Evaluators will not serve as Controllers.
- *Actors.* Actors are exercise participants who act or simulate specific roles during exercise play. They are typically volunteers who have been recruited to play the role of victims or other bystanders.
- *Observers.* Observers visit or view selected segments of the exercise. Observers do not play in the exercise, and do not perform any control or evaluation functions. Observers will view the exercise from a designated observation area and will be asked to remain

- within the observation area during the exercise. VIPs are a type of observer, but are frequently grouped separately. A dedicated group of exercise Controllers should be assigned to manage these groups.
- *Media Personnel.* Some media personnel may be present as observers pending approval by the AEMA personnel and exercise support team members. Media interaction may also be simulated by the SimCell to enhance realism and meet related exercise objectives. A dedicated group of exercise controllers should be assigned to manage these groups.
- *Support Staff.* Exercise support staff includes individuals who are assigned administrative and logistical support tasks during the exercise (i.e. registration, catering, etc.

Exercise Tools

Controller and Evaluator Handbook

The CALVEX 2011 C/E Handbook is designed to help exercise Controllers and evaluators conduct and evaluate an effective exercise. This Handbook also enables Controllers and Evaluators to understand their roles and responsibilities in exercise execution and evaluation. Should a Player, Observer, or media representative find an unattended Handbook, it should be provided to the nearest Controller or Evaluator.

Master Scenario Events List

The MSEL outlines benchmarks, as well as injects that drive exercise play. It also details realistic input to the exercise players as well as information expected to emanate from simulated organizations (i.e., those nonparticipating organizations, agencies, and individuals who would usually respond to the situation). An inject will include several items of information, such as inject time, intended recipient, responsible controller, inject type, a short description of the event, and the expected player action. The CALVEX MSEL was provided to the FEMA evaluation team as a separate document on June 7, 2011.

Exercise Implementation

Exercise Play

Exercise play will begin at approximately 0800 with an initial notification call for CCNPP going to each participating venue. Play will proceed according to the events outlined in the MSEL, in accordance with established plans and procedures. The exercise will conclude upon the completion of operations and attainment of the exercise objectives, as determined by the Lead Offsite Controller.

Exercise Rules

The following are the general rules that govern exercise play:

- Real-world emergency actions take priority over exercise actions.
- Exercise participants will comply with real-world response procedures, unless otherwise directed by control staff.
- All communications (written, radio, telephone, etc.) made during the exercise will begin and end with the phrase, *"This is an exercise."*

Exercise participants placing telephone calls or initiating radio communication with the SimCell must identify the organization, agency, office, and/or individual with whom they wish to speak.

Safety Requirements

General

Exercise participant safety takes priority over exercise events. Although the organizations involved in the CALVEX 2011 come from various response agencies, they share the basic responsibility for ensuring a safe environment for all personnel involved in the exercise. In addition, aspects of an emergency response are dangerous. Professional health and safety ethics should guide all participants to operate in their assigned roles in the safest manner possible. The following general requirements apply to the exercise:

- An exercise Safety Controller will be identified and be responsible for participant safety.
- All exercise controllers, evaluators, and staff will serve as safety observers while the exercise activities are underway. Any safety concerns must be immediately reported to the Safety Controller.
- Participants will be responsible for their own and each other's safety during the exercise. It is the responsibility of all persons associated with the exercise to stop play if, in their opinion, a real safety problem exists. Once the problem is corrected, exercise play can be restarted.
- All organizations will comply with their respective environmental, health, and safety plans and procedures, as well as the appropriate Federal, State, and local environmental health and safety regulations.

Exercise Setup

Exercise setup involves the pre-staging and dispersal of exercise materials; including registration materials, documentation, signage, and other equipment as appropriate.

Accident Reporting and Real Emergencies

- Anyone observing a participant who is seriously ill or injured will first advise the nearest controller, then if possible, renders aid, provided the aid does not exceed his or her training.
- The controller who is made aware of a real emergency will initiate the broadcast *"Real-World Emergency"* on the controller radio network, providing the following information to the Senior Controller and Exercise Director:
  - Venue/function
  - Location within the venue/function
  - Condition
  - Requirements
- The SimCell will be notified as soon as possible if a real emergency occurs.
- If the nature of the emergency requires a suspension of the exercise at the venue/function, all exercise activities at that facility will immediately cease. Exercise play may resume at that venue/function once the "Real-World Emergency" situation has been addressed.
- Exercise play at other venue/functions should not cease if one venue/function has declared a "Real-World Emergency" unless they are reliant on the affected venue.
- If a real emergency occurs that affects the entire exercise, the exercise may be suspended or terminated at the discretion of the Exercise Director and Senior Controller. The notification will be made from the SimCell.

Site Access

Security

Each State of local jurisdiction will control entry to the exercise venues. To prevent confusion and interruption of the exercise, access to the exercise sites and the SimCell will be limited to exercise participants only. Players should advise their venue's controller or evaluator if an unauthorized person is present. Each organization should follow its internal security procedures, augmented as necessary to comply with exercise requirements.

Observer Coordination

Each organization with observers will coordinate with the respective agency or CCNPP contact for access to the exercise site. Observers will be escorted to an observation area for orientation and conduct of the exercise. All observers will be asked to remain within the designated observation area during the exercise. The Exercise Controller and/or an Observer Controller will be present to explain the exercise program and answer questions for the observers during the exercise.

Parking and Directions

Parking information and directions to each venue area are available from the POC list on page iii.

Restroom Facilities

Restroom facilities will be available at each venue.

Exercise Identification

Identification badges will be issued to exercise staff. All exercise personnel and observers will be identified by badges distributed by the staff from each participating agency.

Communications Plan

Exercise Start, Suspension, and Termination Instructions

The exercise is scheduled to run for about 8 hours or until the lead controller determines that the exercise objectives have been met. The lead controller will announce the exercise suspension or termination through the CCNPP dedicated phone and/or the MEMA conference bridge line.

All spoken and written communication will start and end with the statement, "THIS IS AN EXERCISE."

Player Communication

Players will use routine, in-place agency communication systems. Additional communication assets may be made available as the exercise progresses. The need to maintain capability for a real-world response may preclude the use of certain communication channels or systems that would usually be available for an actual emergency incident. In no instance will exercise communication interfere with real-world emergency communications. Each venue will coordinate its own internal communication networks and channels.

The primary means of communication among the SimCell, Controllers, and the venues will be telephone. A list of key telephone and fax numbers, and radio call signs will be available as a Communication Directory before the start of the exercise.

Communications Check

Before the start of the exercise, the CCNPP will conduct a communication check with all interfacing communication means to ensure redundancy and uninterrupted flow of control information. MEMA may conduct additional communications checks as well. An exercise incident will be established on WebEOC from the SEOC

Player Briefing

Controllers/Evaluators may be required to read specific scenario details to the participants to begin exercise play. They may also have technical handouts or other materials to give to players in order to better orient them to the exercise environment.

Public Affairs

This exercise enables Players to demonstrate an increased readiness to deal with a nuclear power plant incident. Any nuclear power plant exercise may be a newsworthy event. Special attention must be given to the needs of the media, allowing them to get as complete and accurate a story as possible while ensuring their activities do not compromise the exercise realism, safety, or objectives.

CCNPP is responsible for disseminating public information in advance of the exercise. FEMA is responsible for publishing the public meeting dates and locations

CHAPTER 3: PLAYER GUIDELINES

Exercise Staff

Exercise Director

The Onsite Lead Controller Director has the overall responsibility for planning, coordinating, and overseeing all exercise functions. He/she manages the exercise activities and maintains a close dialogue with the Controllers regarding the status of play and the achievement of the exercise design objectives.

Lead Controller

The Offsite Lead Controller is responsible for the overall organization of the CALVEX 2011, The Offsite Lead Controller monitors exercise progress and coordinates decisions regarding deviations or significant changes to the scenario caused by unexpected developments during play. The both Lead Controllers monitor actions by individual Controllers and ensures they implement all designated and modified actions at the appropriate time. The Lead Controller debriefs the Controllers after the exercise and oversees the setup and takedown of the exercise.

Controllers

At least one controller will be onsite with every facility and field team participating in the exercise, and at each out-of-sequence interview. The Lead Facility Controller at each location will coordinate any changes that impact the scenario or affect other areas of play through the Lead Controller The individual controllers issue exercise materials to players as required and monitor the exercise timeline. Controllers also provide injects to the players as described in the MSEL.

Lead Evaluator

The Lead Evaluator is responsible for the overall evaluation of the CALVEX 2011. The Lead Evaluator monitors exercise progress and stays in contact with the Lead Controller regarding changes to the exercise during play. The Lead Evaluator monitors actions of individual Evaluators and ensures they are tracking progress of the players in accordance with the Overview of Play. The Lead Evaluator debriefs the evaluators after the exercise and oversees the entire evaluation and After Action process.

Evaluators

Evaluators work under the direction of the Lead Evaluator, and as a team with Controllers. Evaluators are SMEs who record events that take place during the exercise and assess/submit documentation for review and inclusion in the After Action Report (AAR). Evaluators should refrain from any direct interaction with the players during exercise play except with the facilitation of a Controller for clarification of issues or during scheduled interviews.

Player Instructions

Before the Exercise

- Review the appropriate emergency plans, procedures, and exercise support documents.
- Be at the appropriate site at least 30 minutes before the start of the exercise. Wear appropriate uniform/identification badge.
- If you gain knowledge of the scenario before the exercise, notify a controller so that appropriate actions can be taken to ensure a valid evaluation.
- Read your Player Information Handout, which includes information on exercise safety.
- Please sign in.

During the Exercise

- Respond to the exercise events and information as if the emergency were real, unless otherwise directed by an exercise controller.
- Controllers will only give you information they are specifically directed to disseminate. You are expected to obtain other necessary information through existing emergency information channels.
- Do not engage in personal conversations with controllers, evaluators, observers, or media personnel while the exercise is in progress. If you are asked an exercise-related question, give a short, concise answer. If you are busy and cannot immediately respond, indicate so, but report back with an answer at the earliest time possible.
- If you do not understand the scope of the exercise or if you are uncertain about an organization's or agency's participation in an exercise, ask a controller.
- Parts of the scenario may seem implausible. Recognize that the exercise has objectives to satisfy and may require the incorporation of unrealistic aspects. Note that every effort has been made by the trusted agents to balance realism with safety and the creation of an effective learning and evaluation environment.
- All exercise communication will begin and end with the phrase "This is an exercise."

This is a precaution taken so anyone overhearing the conversation will not mistake the exercise play for a real-world emergency.

- When communicating with the SimCell, identify the organization, agency, office, and/or individual with which you want to speak.
- Verbalize out loud when taking an action. This will ensure that evaluators are made aware of critical actions as they occur.
- Maintain a log of your activities. Many times, this log may include documentation of activities missed by a controller or evaluator.

Following the Exercise

- At the end of the exercise at your facility, participate in the Hotwash with the controllers and evaluators.
- Complete the Participant Feedback Form. This form allows you to comment candidly on emergency response activities and effectiveness of the exercise. Please provide the completed form to a controller or evaluator.
- Provide any notes or materials generated from the exercise to your controller or evaluator for review and inclusion in the AAR.

Simulation Guidelines

Because the CALVEX 2011 is of limited duration and scope, the physical description of what would fully occur at the incident sites and surrounding areas will be relayed to the Players by Simulators or Controllers.

If a real emergency occurs during the exercise, the exercise at your respective venue may be suspended or terminated at the discretion of the controller(s) at each venue. If a real emergency occurs, say "Real-World Emergency" and notify the nearest Controller and Evaluator.

CHAPTER 4: EVALUATION AND POST-EXERCISE ACTIVITIES

Exercise Documentation

The goal of the CALVEX 2011 is to comprehensively exercise and evaluate the OROs' plans and capabilities as they pertain to a potential nuclear power plant incident. After the exercise, data collected by Controllers, Evaluators, the SimCell, and Players will be used to identify strengths and areas for improvement in the context of the exercise design objectives.

Exercise Evaluation Guides

DHS has developed Exercise Evaluation Guides (EEGs) that identify expected activities for evaluation, provide consistency across exercises, and link individual tasks to disciplines and expected outcomes.

The EEGs selected by the EPT are contained in the evaluator materials packet along with the C/E Handbook. These EEGs have been selected because the activities they describe can be expected to be observed during the exercise and will guide evaluation to match the exercise design objectives. Supplemental REP evaluation material designed for the exercise may also be used.

Hotwash

Immediately following the completion of exercise play, Controllers will facilitate a Hotwash with Players from their assigned location. The Hotwash is an opportunity for Players to voice their opinions on the exercise and their own performance. At this time, Evaluators can also seek clarification on certain actions and what prompted Players to take them. The Hotwash should not last more that 30 minutes. Evaluators should take notes during the Hotwash and include these observations in their analysis.

Controller and Evaluator Debriefing

Controllers, Evaluators, and selected exercise participants will attend a facilitated Controller and Evaluator Debriefing on Thursday September 15, 2011, 1300 at the Sheraton Hotel in Annapolis. During the debriefing these individuals will discuss their observations of the exercise in an open environment to clarify actions taken during the exercise.

Participants and Public/Media Briefings

The Participants Briefing will be conducted on Friday September 16, 2011at Sheraton Hotel in Annapolis. The Public/Media Briefing will be conducted on September 16, 2011at the same location.

After Action Report

The AAR is the culmination of the exercise. It is a written report outlining the strengths and areas for improvement identified during the exercise. The AAR will include the timeline, executive summary, scenario description, mission outcomes, and capability analysis. The AAR will be drafted by a core group of individuals from the exercise planning team.

After Action Conference and Improvement Plan

The improvement process represents the comprehensive, continuing preparedness effort of which the CALVEX 2011 is a part. The lessons learned and recommendations from the AAR will be incorporated into the Improvement Plan (IP).

After Action Conference

The After Action Conference (AAC), scheduled for a date to be determined by the MEMA Exercise and Training Branch as a forum for jurisdiction officials to hear the results of the evaluation analysis, validate the findings and recommendations in the draft AAR, and begin development of the IP.

Improvement Plan

The IP identifies how recommendations will be addressed, including what actions will be taken, who is responsible, and the timeline for completion. It is created by key stakeholders from the CALVEX 2011 participating agency officials during the AAC to be scheduled by the MEMA Exercise and Training Branch

APPENDIX A: EXERCISE SCHEDULE

Table A.1 *CALVEX 2011 Schedule*

Date / Time (Tentative)	Personnel	Activity
July 13 / 0900	Dorchester County	Reception Center Monitoring and Decontamination, Emergency Worker Monitoring and Decontamination, Congregate Care
July 14 / 0900	Calvert County	Reception Center Monitoring and Decontamination, Emergency Worker Monitoring and Decontamination, Congregate Care
July 15 / 0900	St Mary's County	Reception Center Monitoring and Decontamination, Emergency Worker Monitoring and Decontamination, Congregate Care
September 13 / 0800	State and Risk County	CALVEX 2011
September 14 / 0900	Calvert and St Mary's County	School Evaluations

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APPENDIX B: EXTENT OF PLAY INFORMATION

MARYLAND

CALVEX '11

Plume Pathway Exercise

STATE OF MARYLAND

EXERCISE CRITERIA

AND

EXTENT OF PLAY

Approved Director, Maryland Emergency Management Agency / Date

REVISION 3

Final
Revised September 13, 2011 / Re-scheduled Evaluations to October 18, 2011

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INTRODUCTION

Due to the effects of hurricane Irene, the CALVEX '11 federally evaluated exercise was rescheduled from September 13, 2011 to October 18, 2011. This document reflects the revised evaluation dates.

The purpose of this document is to establish those exercise evaluation areas and corresponding extent of play parameters expected to be demonstrated during the Calvert Cliffs Nuclear Power Plant Plume Pathway graded exercise to be conducted on October 18, 2011.

These evaluation areas have been developed through reviews of past exercises, associated plans and procedures, the proposed exercise scenario, applicable FEMA guidance documents, and extensive discussions with FEMA representatives. HSEEP principles will be incorporated wherever feasible.

All demonstrations will be conducted in accordance with established plans and procedures, except as noted for specific exercise evaluation areas described in this Extent of Play.

To minimize the impact on schools administrators and facilities, the following activities will be evaluated during the week of July 11 – 15 to support Reception Center, Public and Emergency Worker Monitoring and Decontamination for the three Calvert Cliffs risk jurisdictions in Maryland. The out-of-sequence activities to be demonstrated are:

- 6. a – Monitoring and Decontamination of Evacuees and Emergency Workers, and Registration of Evacuees
- 6.b – Monitoring and Decontamination of Emergency Worker Equipment
- 6.c – Temporary Care of Evacuees

One additional out-of-sequence evaluation for plume phase activity will be conducted on October 19th, 2011 involving Calvert County and St Mary's County. The out-of-sequence activity to be demonstrated is:

- 3.c – Implementation of Protective Actions for Special Populations – Schools

The full-scale graded plume phase exercise will be conducted on October 18th, 2011

involving all the Calvert Cliffs risk jurisdictions and selected State agencies in Maryland. Demonstration activities will be initiated following a simulated accident at the plant. Actions will be taken in accordance with each jurisdiction's emergency plan and procedures unless specified under the specific extent of play.

State Locations

State EOC, Reisterstown, MD

State AAC, Maryland Department of the Environment
Baltimore / Barstow

Joint Information Center / Barstow

State Field Teams (Plume)

Plume Zone Local Jurisdictions / Locations

Calvert County

- Calvert County Government
- Huntingtown High School (Reception / Mass Care)
- Stafford Road Landfill (Emergency Worker Decontamination)
- Patuxent High School (Risk School)
- Dowell Elementary (Risk School)
- Mutual Elementary (Risk School)

St. Mary's County

- St Mary's County Government
- Leonardtown High School (Reception)
- Hollywood Elementary (Risk School)
- Town Creek Elementary (Risk School)

Dorchester County

- Dorchester County Government
- Cambridge High School (Mass Care)
- Dorchester County Career and Technology Center (2465 Cambridge Beltway, Cambridge, MD 21613) Reception Center / Emergency Worker Decontamination / Mass Care)

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 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)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to alert, notify, and mobilize emergency personnel and to activate and staff emergency facilities.

EXTENT OF PLAY

Responsible OROs should demonstrate the capability to receive notification of an emergency situation from the licensee, verify the notification, and contact, alert, and mobilize key emergency personnel in a timely manner. Responsible OROs should demonstrate the activation of facilities for immediate use by mobilized personnel when they arrive to begin emergency operations. Activation of facilities should be completed in accordance with the plan and/or procedures. Pre-positioning of emergency personnel is appropriate, in accordance with the extent of play agreement, at those facilities located beyond a normal commuting distance from the individual's duty location or residence. Further, pre-positioning of staff for out-of-sequence demonstrations is appropriate in accordance with the extent of play agreement.

State of Maryland Extent of Play:

All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement. Selected personnel may pre-stage at State or county locations to minimize impact of travel time. Out-of-sequence locations will not demonstrate mobilization. Twenty-four hour rosters will be available for key players at each EOC.

Locations evaluated;

State EOC, AAC, and JIC
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues

None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

Sub-element 1.b – Facilities

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have facilities to support the emergency response.

EXTENT OF PLAY

Facilities will only be specifically evaluated for this criterion if they are new or have substantial changes in structure or mission. Responsible OROs should demonstrate the availability of facilities that support the accomplishment of emergency operations. 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).

State of Maryland Extent of Play:
Reception and Congregate Care centers will be demonstrated as an out of sequence activity in July. All State and county operations centers have been previously demonstrated. The Dorchester County Career and Technology is the only new facility that has not been evaluated.

Locations evaluated;
Dorchester County Career and Technology
Calvert County Emergency Worker Decontamination Center

Outstanding Issues
None

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the capability to control their overall response to an emergency.

EXTENT OF PLAY

Leadership personnel should demonstrate the ability to carry out essential functions of the response effort, for example: keeping the staff informed through periodic briefings and/or other means, coordinating with other appropriate OROs, and ensuring completion of requirements and requests.

State of Maryland Extent of Play:

All activities associated with direction and control will be performed based on the ORO's plans and procedures and completed, as they would be in an actual emergency.

Locations evaluated;

State EOC
State AAC, (Baltimore and Barstow locations)
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues

None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

Sub-element 1.d – Communications Equipment

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should establish reliable primary and backup communication systems to ensure communications with key emergency personnel at locations such as the following: appropriate contiguous governments within the emergency planning zone (EPZ), Federal emergency response organizations, the licensee and its facilities, emergency operations centers (EOC), and field teams.

EXTENT OF PLAY

OROs will demonstrate that a primary and at least one backup system are fully functional at the beginning of an exercise. If a communications system or system are not functional, but exercise performance is not affected, no exercise issue will be assessed. Communications equipment and procedures for facilities and field units should be used as needed for the transmission and receipt of exercise messages. All facilities and field teams should have the capability to access at least one communication system that is independent of the commercial telephone system. Responsible OROs should demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt the conduct of emergency operations. OROs should ensure that a coordinated communication link for fixed and mobile medical support facilities exists.

The specific communications capabilities of OROs should be commensurate with that specified in the response plan and/or procedures. Exercise scenarios could require the failure of a communications system and the use of an alternate system.

State of Maryland Extent of Play:
All activities associated with the management of communications capabilities will be

demonstrated based on the ORO's plans and procedures and completed as they would be in an actual emergency. Equipment failures will not be injected into the exercise scenario. Actual failures will require back-up communication demonstration. Interviews may be conducted to explain back up communication capabilities.

Locations evaluated;
State EOC, AAC, Field Teams (plume), Calvert, St. Mary's and Dorchester Counties,

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have emergency equipment and supplies adequate to support the emergency response.

EXTENT OF PLAY

Equipment within the facility(ies) should be sufficient and consistent with the role assigned to that facility in the ORO's plans and/or procedures in support of emergency operations. Use of maps and displays is encouraged.

All instruments, including air sampling flow meters (field teams only), should be inspected, inventoried, and operationally checked before each use. They should be calibrated in accordance with the manufacturer's recommendations (or at least annually for the unmodified CDV-700 series or if there are no manufacturer's recommendations for a specific instrument; modified CDV-700 instruments should be calibrated in accordance with the recommendation of the modification manufacturer.). A label indicating such calibration should be on each instrument or verifiable by other means. Note: Field team equipment is evaluated under 4.a.1; radiological laboratory equipment under 4.c.1; reception center and emergency worker facilities' equipment is evaluated under 6.a.1; and ambulance and medical facilities' equipment is evaluated under 6.d.1.

Sufficient quantities of appropriate direct-reading and permanent record dosimetry and dosimeter chargers should be available for issuance to all categories of emergency workers that could be deployed from that facility. Appropriate direct-reading dosimeters should allow individual(s) to read the administrative reporting limits and maximum exposure limits contained in the ORO's plans and procedures.

Dosimeters should be inspected for electrical leakage at least annually and replaced, if necessary. CDV-138s, due to their documented history of electrical leakage problems, should be inspected for electrical leakage at least quarterly and replaced if necessary. This leakage testing will be verified during the exercise, through documentation submitted in the Annual Letter of Certification, and/or through a staff assistance visit.

Responsible OROs should demonstrate the capability to maintain inventories of KI sufficient for use by emergency workers, as indicated on rosters; institutionalized individuals, as indicated in capacity lists for facilities; and, where stipulated by the plan and/or procedures, members of the general public (including transients) within the plume pathway EPZ.

Quantities of dosimetry and KI available and storage locations(s) will be confirmed by physical inspection at storage location(s) or through documentation of current inventory submitted during the exercise, provided in the Annual Letter of Certification submission, and/or verified during a Staff Assistance Visit. Available supplies of KI should be within the expiration date indicated on KI bottles or blister packs. As an alternative, the ORO may produce a letter from FEMA indicating that the KI supply remains potent, in accordance with Food and Drug Administration (FDA) guidance. FEMA issues these letters based upon the findings of the certified independent laboratory that performed the analysis at the ORO's request and expense.

At locations where traffic and access control personnel are deployed, appropriate equipment (e.g., vehicles, barriers, traffic cones and signs, etc.) should be available or their availability described.

State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. Electrical leakage information is included with the Annual Letter of certification. Electronic dosimetry used at some locations does not require electrical leakage testing. Actual self-reading dosimetry will be issued however permanent dosimetry may be simulated. Quantities of dosimetry and KI available and storage locations(s) have been confirmed by documentation of current inventory submitted the Annual Letter of Certification submission. KI tablets for emergency workers will be simulated. Actual distribution of KI will not be demonstrated

Locations evaluated;
State EOC, AAC, Field Teams (plume), Calvert, St. Mary's and Dorchester Counties

KI Storage Locations

Calvert County	Calvert County Health Dept.
St. Mary's County	St. Mary's County EOC.
Dorchester County	Dorchester County EOC & Health Dept.

Outstanding Issues:
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

Sub-element 2.a – Emergency Worker Exposure Control

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

INTENT

This sub-element is derived from NUREG-0654, which provides that an ORO have the capability to assess and control the radiation exposure received by emergency workers and have a decision chain in place as specified in the ORO's plans and procedures to authorize emergency worker exposure limits to be exceeded for specific missions.

Radiation exposure limits for emergency workers are the recommended accumulated dose limits or exposure rates that emergency workers may be permitted to incur during an emergency. These limits include any pre-established administrative reporting limits (that take into consideration Total Effective Dose Equivalent or organ-specific limits) identified in the ORO's plans and procedures.

EXTENT OF PLAY

OROs authorized to send emergency workers into the plume exposure pathway EPZ should demonstrate a capability to meet the criterion based on their emergency plans and procedures.

Responsible OROs should demonstrate the capability to make decisions concerning the authorization of exposure levels in excess of pre-authorized levels and to the number of emergency workers receiving radiation dose above pre-authorized levels.

As appropriate, OROs should demonstrate the capability to make decisions on the distribution and administration of KI, as a protective measure, based on the ORO's plans and/or procedures or projected thyroid dose compared with the established protective action guides (PAGs) for KI administration.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. KI tablets for emergency workers will be simulated. Actual distribution of KI will not be demonstrated.

Locations evaluated;
State Field Teams (plume),
Calvert, St. Mary's and Dorchester Counties (*)

- Field Teams
- Monitoring and Decontamination
- Route Alerting
- TCP / ACP

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

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

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

INTENT

This sub-element is derived from NUREG-0654, which indicates that OROs have the capability to independently project integrated dose from exposure rates or other information and compare the estimated dose savings with the protective action guides. OROs have the capability to choose, among a range of protective actions, those most appropriate in a given emergency situation. OROs base these choices on protective action guides (PAGs) from the ORO's plans and procedures, or EPA 400-R-92-001 and other criteria, such as, plant conditions, licensee protective action recommendations, coordination of protective action decisions with other political jurisdictions (e.g. other affected OROs), availability of appropriate in-place shelter, weather conditions, evacuation time estimates, and situations that create higher than normal risk from evacuation.

EXTENT OF PLAY

During the initial stage of the emergency response, following notification of plant conditions that may warrant offsite protective actions, the ORO should demonstrate the capability to use appropriate means, described in the plan and/or procedures, to develop protective action recommendations (PARs) for decision-makers based on available information and recommendations from the licensee and field monitoring data, if available.

When release and meteorological data are provided by the licensee, the ORO also considers these data. The ORO should demonstrate a reliable capability to independently validate dose projections. The types of calculations to be demonstrated depend on the data available and the need for assessments to support the PARs appropriate to the scenario. In all cases, calculation of projected dose should be demonstrated. Projected doses should be related to quantities and units of the PAGs to which they will be compared. PARs should be promptly transmitted to decision-makers in a prearranged format.

Differences greater than a factor of 10 between projected doses by the licensee and the ORO should be discussed with the licensee with respect to the input data and assumptions used, use of different models, or other possible reasons.

Resolution of these differences should be incorporated into the PAR if timely and appropriate. The ORO should demonstrate the capability to use any additional data to refine projected doses and exposure rates and revise the associated PARs.

State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency.

Locations evaluated;
State AAC

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

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

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

INTENT

This sub-element is derived from NUREG-0654, which indicates that OROs have the capability to independently project integrated dose from exposure rates or other information and compare the estimated dose savings with the protective action guides. OROs have the capability to choose, among a range of protective actions, those most appropriate in a given emergency situation and base these choices on protective action guides (PAGs) from the ORO's plans and procedures, FRC Reports Numbers 5 and 7 or EPA 400-R-92-001 and other criteria, such as, plant conditions, licensee protective action recommendations, coordination of protective action decisions with other political jurisdictions (e.g. other affected OROs), availability of appropriate in-place shelter, weather conditions, evacuation time estimates, and situations that create higher than normal risk from evacuation.

EXTENT OF PLAY

OROs should have the capability to make both initial and subsequent PADs. They should demonstrate the capability to make initial PADs in a timely manner appropriate to the situation, based on notification from the licensee, assessment of plant status and releases, and PARs from the utility and ORO staff.

The dose assessment personnel may provide additional PARs based on the subsequent dose projections, field monitoring data, or information on plant conditions. The decision-makers should demonstrate the capability to change protective actions as appropriate based on these projections.

If the ORO has determined that KI will be used as a protective measure for the general public under off-site plans, then the ORO should demonstrate the capability to make decisions on the distribution and administration of KI as a protective measure for the general public to supplement shelter and evacuation protective actions. This decision should be based on the ORO's plan and/or procedures or projected thyroid dose

compared with the established PAG for KI administration. The KI decision-making process should involve close coordination with appropriate assessment and decision-making staff.

If more than one ORO is involved in decision-making, OROs should communicate and coordinate PADs with affected OROs. OROs should demonstrate the capability to communicate the contents of decisions to the affected jurisdictions.

State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. The process for making KI for the general public available at reception centers will be described to the evaluator at the appropriate centers. Actual KI will not be transported. KI will be available for inspection at the respective storage location. (Note – this may be demonstrated during the out-of-sequence evaluations)

Locations evaluated;	**KI Storage Locations**
State EOC, AAC,	
Calvert County	Calvert County Health Dept
St. Mary's County	St. Mary's County EOC
Dorchester County	Dorchester County EOC & Health Dept

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to determine protective action recommendations, including evacuation, sheltering and use of potassium iodide (KI), if applicable, for special population groups (e.g., hospitals, nursing homes, correctional facilities, schools, licensed day care centers, mobility impaired individuals, and transportation dependent individuals). Focus is on those special population groups that are (or potentially will be) affected by a radiological release from a nuclear power plant.

EXTENT OF PLAY

Usually, it is appropriate to implement evacuation in areas where doses are projected to exceed the lower end of the range of PAGs, except for situations where there is a high-risk environment or where high-risk groups (e.g., the immobile or infirm) are involved: In these cases, examples of factors that should be considered are weather conditions, shelter availability, Evacuation Time Estimates, availability of transportation assets, risk of evacuation vs. risk from the avoided dose, and precautionary school evacuations. In situations where an institutionalized population cannot be evacuated, the administration of KI should be considered by the OROs.

State of Maryland Extent of Play:

All decision-making activities associated with protective actions, including consideration of available resources, for special population groups will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. List of any special populations will be available for review. School protective actions will be demonstrated as an out-of-sequence activity. Private schools, private kindergartens and day care centers will not participate in the exercise however, OROs will have lists of any facilities located within the jurisdiction available for review.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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Locations evaluated;
Calvert County
St. Mary's County
Dorchester County

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA3: PROTECTIVE ACTION IMPLEMENTATION

SUB-ELEMENT 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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to provide for the following: distribution, use, collection, and processing of direct-reading dosimeters and permanent record dosimeters; provide for direct-reading dosimeters to be read at appropriate frequencies by emergency workers; maintain a radiation dose record for each emergency worker; and provide for establishing a decision chain or authorization procedure for emergency workers to incur radiation exposures in excess of protective action guides, always applying the ALARA (As Low As is Reasonably Achievable) principle as appropriate.

EXTENT OF PLAY

OROs should demonstrate the capability to provide appropriate direct-reading and permanent record dosimetry, dosimetry chargers, and instructions on the use of dosimetry to emergency workers. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows individual(s) to read the administrative reporting limits (that are pre-established at a level low enough to consider subsequent calculation of Total Effective Dose Equivalent) and maximum exposure limits (for those emergency workers involved in life saving activities) contained in the OROs plans and procedures.

Each emergency worker should have the basic knowledge of radiation exposure limits as specified in the ORO's plan and/or procedures. Procedures to monitor and record dosimeter readings and to manage radiological exposure control should be demonstrated.

During a plume phase exercise, emergency workers should demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. The emergency worker should report accumulated exposures during the exercise as indicated in the plans and procedures. OROs should demonstrate the actions described in the plan and/or procedures by determining whether to

replace the worker, to authorize the worker to incur additional exposures or to take other actions. If scenario events do not require emergency workers to seek authorizations for additional exposure, evaluators should interview at least two emergency workers, to determine their knowledge of whom to contact in the event authorization is needed and at what exposure levels. Emergency workers may use any available resources (e.g. written procedures and/or co-workers) in providing responses.

Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and adequate control of exposure can be effected for all members of the team by one dosimeter worn by the team leader. Emergency workers who are assigned to low exposure rate areas, e.g., at reception centers, counting laboratories, emergency operations centers, and communications centers, may have individual direct-reading dosimeters or they may be monitored by dosimeters strategically placed in the work area. It should be noted that, even in these situations, each team member must still have their own permanent record dosimeter.

Individuals without specific radiological response missions, such as farmers for animal care, essential utility service personnel, or other members of the public who must re-enter an evacuated area following or during the plume passage, should be limited to the lowest radiological exposure commensurate with completing their missions.

State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. Dosimetry electrical leakage checks will be submitted with the ALC. Electronic dosimetry may be substituted for SRD's at some state or local jurisdictions.

Locations evaluated;
State Field Teams (plume),

Calvert, St. Mary's and Dorchester Counties

- TCP/ACP
- Field Teams
- Route Alerting
- Monitoring and Decontamination

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

Outstanding Issues:
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA3: PROTECTIVE ACTION IMPLEMENTATION

Sub-element 3.b – Implementation of KI Decision

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to provide radio-protective drugs for emergency workers, institutionalized individuals, and, if in the plan and/or procedures, to the general public for whom immediate evacuation may not be feasible, very difficult, or significantly delayed. While it is necessary for OROs to have the capability to provide KI to emergency workers and institutionalized individuals, the provision of KI to the general public is an ORO option, reflected in ORO's plans and procedures. Provisions should include the availability of adequate quantities, storage, and means of the distribution of radio-protective drugs.

EXTENT OF PLAY

OROs should demonstrate the capability to make KI available to emergency workers, institutionalized individuals, and, where provided for in the ORO plan and/or procedures, to members of the general public. OROs should demonstrate the capability to accomplish distribution of KI consistent with decisions made. Organizations should have the capability to develop and maintain lists of emergency workers and institutionalized individuals who have ingested KI, including documentation of the date(s) and time(s) they were instructed to ingest KI. The ingestion of KI recommended by the designated ORO health official is voluntary. For evaluation purposes, the actual ingestion of KI is **not** necessary. OROs should demonstrate the capability to formulate and disseminate appropriate instructions on the use of KI for those advised to take it. If a recommendation is made for the general public to take KI, appropriate information should be provided to the public by the means of notification specified in the ORO's plan and/or procedures.

Emergency workers should demonstrate the basic knowledge of procedures for the use of KI whether or not the scenario drives the use of KI. This can be accomplished by an interview with the evaluator.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. There are no special facilities within the Dorchester County 10-mile emergency Planning Zone.

Locations evaluated;
State Field Teams (plume)
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues:
None

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to implement protective action decisions, including evacuation and/or sheltering, for all special populations. Focus is on those special populations that are (or potentially will be) affected by a radiological release from a nuclear power plant.

EXTENT OF PLAY

Applicable OROs should demonstrate the capability to alert and notify (e.g., provide protective action recommendations and emergency information and instructions) special populations (hospitals, nursing homes, correctional facilities, mobility impaired individuals, transportation dependent, etc). OROs should demonstrate the capability to provide for the needs of special populations in accordance with the ORO's plans and procedures.

Contact with special populations and reception facilities may be actual or simulated, as agreed to in the Extent of Play. At least 1/3 of transportation providers (including special resources for disabled individuals) must be actually contacted during each exercise. All actual and simulated contacts should be logged.

All implementing activities associated with protective actions for special populations must be based on the ORO's plans and procedures and completed as they would in an actual emergency, unless otherwise indicated in the extent of play agreement.

State of Maryland Extent of Play:

Lists of any special populations will be verified at the EOC. Contact with any facility will be simulated or discussed at the EOC. Some facilities (~ 10%) may actually be contacted.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

Locations evaluated;
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues
None

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to implement protective action decisions, including evacuation and/or sheltering, for all special populations. Focus is on those special population groups that are (or potentially will be) affected by a radiological release from a nuclear power plant.

EXTENT OF PLAY

Applicable OROs should demonstrate the capability to alert and notify all public school systems/districts, licensed day care centers, and participating private schools within the emergency planning zone of emergency conditions that are expected to or may necessitate protective actions for students.

In accordance with plans and/or procedures, OROs and/or officials of participating public and private schools and licensed day care centers should demonstrate the capability to make and implement prompt decisions on protective actions for students. Officials should demonstrate that the decision making process for protective actions considers (e.g., either accepts automatically or gives heavy weight to) protective action recommendations made by ORO personnel, the ECL at

which these recommendations are received, preplanned strategies for protective actions for that ECL, and the location of students at the time (e.g., whether the students are still at home, en route to the school, or at the school).

Implementation of protective actions should be completed subject to the following provisions: At least one school in each affected school system or district, as appropriate, needs to demonstrate the implementation of protective actions. The implementation of canceling the school day, dismissing early, or sheltering should be simulated by describing to evaluators the procedures that would be followed. If evacuation is the implemented protective action, all activities to coordinate and complete the evacuation of students to reception centers, congregate care centers, or host schools may actually be demonstrated or accomplished through an interview process. If accomplished through an interview process, appropriate school

personnel including decision making officials (e.g., superintendent/principal, transportation director/bus dispatcher), and at least one bus driver (and the bus driver's escort, if applicable) should be available to demonstrate knowledge of their role(s) in the evacuation of school children. Communications capabilities between school officials and the buses, if required by the plan and/or procedures, should be verified.

Officials of the participating school(s) or school system(s) should demonstrate the capability to develop and provide timely information to OROs for use in messages to parents, the general public, and the media on the status of protective actions for schools.

State of Maryland Extent of Play:
Calvert and St. Mary's county will demonstrate protective actions for schools as an out-of-sequence activity. There are no risk schools in Dorchester County. Protective actions for school children that live inside the 10-mile EPZ but attend school outside the 10-mile EPZ will be demonstrated by actions taken in the EOC during the actual exercise. Private schools, private kindergartens and day care centers will not participate in the exercise. However, OROs will have lists of any facilities located within the jurisdiction available for review.

This element will be evaluated as an out-of-sequence activity

Locations evaluated;

Calvert County
- Patuxent High School (Risk School)
- Dowell Elementary (Risk School)
- Mutual Elementary (Risk School)

St. Mary's County
- Hollywood Elementary (Risk School)
- Town Creek Elementary (Risk School)

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the capability to implement protective action plans, including relocation and restriction of access to evacuated/sheltered areas. This sub-element focuses on selecting, establishing, and staffing of traffic and access control points and removal of impediments to the flow of evacuation traffic.

EXTENT OF PLAY

OROs should demonstrate the capability to select, establish, and staff appropriate traffic and access control points consistent with protective action decisions (for example, evacuating, sheltering, and relocation), in a timely manner. OROs should demonstrate the capability to provide instructions to traffic and access control staff on actions to take when modifications in protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled.

Traffic and access control staff should demonstrate accurate knowledge of their roles and responsibilities. This capability may be demonstrated by actual deployment or by interview in accordance with the extent of play agreement.

In instances where OROs lack authority necessary to control access by certain types of traffic (rail, water, and air traffic), they should demonstrate the capability to contact the State or Federal agencies with have authority to control access.

State of Maryland Extent of Play:

Traffic and Access control points will be established administratively in the EOC based on scenario conditions. Access control points will be established in the vicinity of the EOC (parking lot) and not at an actual field location. Communications with the TCP/ACP will occur as they would in an actual emergency. Air and water controls will be coordinated (simulated) from the SEOC.

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Locations evaluated;
State EOC
Calvert County
St. Mary's County
Dorchester County

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the capability to implement protective action plans, including relocation and restriction of access to evacuated/sheltered areas. This sub-element focuses on selecting, establishing, and staffing of traffic and access control points and removal of impediments to the flow of evacuation traffic.

EXTENT OF PLAY

OROs should demonstrate the capability, as required by the scenario, to identify and take appropriate actions concerning impediments to evacuation. Actual dispatch of resources to deal with impediments, such as wreckers, need not be demonstrated; however, all contacts, actual or simulated should be logged.

State of Maryland Extent of Play:
All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless specified above or indicated in the extent of play agreement. Actual equipment will not be dispatched.

Locations evaluated;
Calvert County
St. Mary's County
Dorchester County

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 4 : FIELD MEASUREMENT AND ANALYSIS

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

Criterion 4.a.1: The field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates. (NUREG-0654, H.10, I.8., 9., 11.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to deploy field teams with the equipment, methods, and expertise necessary to determine the location of airborne radiation and particulate deposition on the ground from an airborne plume. In addition, NUREG-0654 indicates that OROs should have the capability to use field teams within the plume emergency planning zone to measure airborne radioiodine in the presence of noble gases and to measure radioactive particulate material in the airborne plume.

In the event of an accident at a nuclear power plant, the possible release of radioactive material may pose a risk to the nearby population and environment. Although accident assessment methods are available to project the extent and magnitude of a release, these methods are subject to large uncertainties. During an accident, it is important to collect field radiological data in order to help characterize any radiological release. This does not imply that plume exposure projections should be made from the field data. Adequate equipment and procedures are essential to such field measurement efforts.

EXTENT OF PLAY

Field teams should be equipped with all instruments and supplies necessary to accomplish their mission. This should include instruments capable of measuring gamma exposure rates and detecting the presence of beta radiation. These instruments should be capable of measuring a range of activity and exposure, including radiological protection/exposure control of team members and detection of activity on the air sample collection media, consistent with the intended use of the instrument and the ORO's plans and procedures. An appropriate radioactive check source should be used to verify proper operational response for each low range radiation measurement instrument (less than 1 R/hr) and for high range instruments when available. If a source is not available for a high range instrument, a procedure should exist to operationally test the instrument before entering an area where only a high range instrument can make useful readings.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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State of Maryland Extent of Play:
All activities will be based on the ORO's plans and procedures and completed as they would be in an actual emergency. Plume zone field teams use equipment to measure ambient radiation levels only. County field teams do not perform air sampling or air sampling analysis.

Locations evaluated;
(2) State (MDE) Field Teams (plume)
(1 ea) Calvert, St Mary's and Dorchester County Field Teams

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 4: FIELD MEASUREMENT AND ANALYSIS

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

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).

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to deploy field teams with the equipment, methods, and expertise necessary to determine the location of airborne radiation and particulate deposition on the ground from an airborne plume. In addition, NUREG-0654 indicates that OROs should have the capability to use field teams within the plume emergency planning zone to measure airborne radioiodine in the presence of noble gases and to measure radioactive particulate material in the airborne plume.

In the event of an accident at a nuclear power plant, the possible release of radioactive material may pose a risk to the nearby population and environment. Although accident assessment methods are available to project the extent and magnitude of a release, these methods are subject to large uncertainties. During an accident, it is important to collect field radiological data in order to help characterize any radiological release. This does not imply that plume exposure projections should be made from the field data. Adequate equipment and procedures are essential to such field measurement efforts.

EXTENT OF PLAY

Responsible OROs should demonstrate the capability to brief teams on predicted plume location and direction, travel speed, and exposure control procedures before deployment.

Field measurements are needed to help characterize the release and to support the adequacy of implemented protective actions or to be a factor in modifying protective actions. Teams should be directed to take measurements in such locations, at such times to provide information sufficient to characterize the plume and impacts.

If the responsibility to obtain peak measurements in the plume has been accepted by license field monitoring teams, with concurrence from OROs, there is no requirement for these measurements to be repeated by State and local monitoring teams. If the license teams do not obtain peak measurements in the plume, it is the ORO's decision as to whether peak measurements are necessary to sufficiently characterize the plume. The sharing and coordination of plume measurement information among all

field teams (licensee, federal, and ORO) is essential. Coordination concerning transfer of samples, including a chain-of-custody form, to a radiological laboratory should be demonstrated.

OROs should use Federal resources as identified in the Federal Radiological Emergency Response Plan (FRERP), and other resources (e.g., compacts, etc), if available. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

State of Maryland Extent of Play:
These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. At least six readings will be obtained by each team at a survey point location. IAW agreements with Constellation Energy and State and Local organizations, State and local teams will not measure plume centerline radiation levels. Airborne radioactivity samples will be counted in the field. Chain of custody procedures to deliver samples for additional analysis will be described to the evaluator. County field teams do not perform air sampling or air sampling analysis.

Locations evaluated;
State MDE Field Teams (2) (plume)
Calvert, St. Mary's, and Dorchester Counties (1 each)

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 4: FIELD MEASUREMENT AND ANALYSIS

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

Criterion 4.a.3: Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media. (NUREG-0654, I.8., 9., 11.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to deploy field teams with the equipment, methods, and expertise necessary to determine the location of airborne radiation and particulate deposition on the ground from an airborne plume. In addition, NUREG-0654 indicates that OROs should have the capability to use field teams within the plume emergency planning zone to measure airborne radioiodine in the presence of noble gases and to measure radioactive particulate material in the airborne plume.

In the event of an accident at a nuclear power plant, the possible release of radioactive material may pose a risk to the nearby population and environment. Although accident assessment methods are available to project the extent and magnitude of a release, these methods are subject to large uncertainties. During an accident, it is important to collect field radiological data in order to help characterize any radiological release. This does not imply that plume exposure projections should be made from the field data. Adequate equipment and procedures are essential to such field measurement efforts.

EXTENT OF PLAY

Field teams should demonstrate the capability to report measurements and field data pertaining to the measurement of airborne radioiodine and particulates to the field team coordinator, dose assessment, or other appropriate authority. If samples have radioactivity significantly above background, the appropriate authority should consider the need for expedited laboratory analyses of these samples. OROs should share data in a timely manner with all appropriate OROs. The methodology, including contamination control, instrumentation, preparation of samples, and a chain-of-custody form for transfer to a laboratory, will be in accordance with the ORO plan and/or procedures.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

OROs should use Federal resources as identified in the FRERP, and other resources (e.g., compacts, etc), if available. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

State of Maryland Extent of Play:
These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. Only the State teams will demonstrate this objective. One sample will be obtained in an area that exhibits above ambient background radiation levels (plume edge) if applicable. Scenario data / location may not result in access to plume dose. Delivery of samples for additional analysis will not be demonstrated. Chain of custody procedures will be described to the evaluator.

Locations evaluated;
(2) State MDE Field Teams (plume)

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 5: EMERGENCY NOTIFICATION AND PUBLIC INFORMATION

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

Criterion 5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite 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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to provide prompt instructions to the public within the plume pathway EPZ. Specific provisions addressed in this sub-element are derived from the Nuclear Regulatory Commission (NRC) regulations (10 CFR Part 50, Appendix E.IV.D.), and FEMA-REP-10, "Guide for the Evaluation of Alert and Notification systems for Nuclear Power Plants."

EXTENT OF PLAY

Responsible OROs should demonstrate the capability to sequentially provide an alert signal followed by an initial instructional message to populated areas (permanent resident and transient) throughout the 10-mile plume pathway EPZ. Following the decision to activate the alert and notification system, in accordance with the ORO's plan and/or procedures, completion of system activation should be accomplished in a timely manner **(will not be subject to specific time requirements)** for primary alerting/notification. The initial message should include the elements required by current FEMA REP guidance.

For exercise purposes, timely is defined as "the responsible ORO personnel/ representatives demonstrate actions to disseminate the appropriate information/ instructions with a sense of urgency and without undue delay." If message dissemination is to be identified as not having been accomplished in a timely manner, the evaluator(s) will document a specific delay or cause as to why a message was not considered timely.

Procedures to broadcast the message should be fully demonstrated as they would in an actual emergency up to the point of transmission. Broadcast of the message(s) or test messages is not required. The alert signal activation may be simulated. However, the procedures should be demonstrated up to the point of actual activation.

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Homeland Security Exercise and Evaluation Program (HSEEP)

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The capability of the primary notification system to broadcast an instructional message on a 24-hour basis should be verified during an interview with appropriate personnel from the primary notification system.

State of Maryland Extent of Play:
These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. Contact with one EAS station for each responsible ORO will be demonstrated. Actual siren sounding and EAS demonstration will be simulated.

-Note-

Calvert and St. Mary's County coordinate activation with the same EAS station. One county (Calvert) will make contact with the EAS station with a message for both counties. The State may activate EAS as a back-up for any of the county locations.

Locations evaluated;
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 5: EMERGENCY NOTIFICATION AND PUBLIC INFORMATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to provide prompt instructions to the public within the plume pathway EPZ. Specific provisions addressed in this sub-element are derived from the Nuclear Regulatory Commission (NRC) regulations (10 CFR Part 50, Appendix E.IV.D.) and FEMA-REP-10, "Guide for the Evaluation of Alert and Notification systems for Nuclear Power Plants."

EXTENT OF PLAY

OROs with FEMA-approved exception areas (identified in the approved Alert and Notification System Design Report) 5-10 miles from the nuclear power plant should demonstrate the capability to accomplish primary alerting and notification of the exception area(s) within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. The 45-minute clock will begin when the OROs make the decision to activate the alert and notification system for the first time for a specific emergency situation. The initial message should, at a minimum, include: a statement that an emergency exists at the plant and where to obtain additional information.

For exception area alerting, at least one route needs to be demonstrated and evaluated. The selected routes should vary from exercise to exercise. However, the most difficult route should be demonstrated at least once every six years. All alert and notification activities along the route should be simulated (e.g., the message that would actually be used is read for the evaluator, but not actually broadcast) as agreed upon in the extent of play. Actual testing of the mobile public address system will be conducted at some agreed upon location.

Backup alert and notification of the public should be completed within 45 minutes following the detection by the ORO of a failure of the primary alert and notification

system. Backup route alerting needs only be demonstrated and evaluated, in accordance with the ORO's plan and/or procedures and the extent of play agreement, if the exercise scenario calls for failure of any portion of the primary system(s), or if any portion of the primary system(s) actually fails to function. If demonstrated, only one route needs to be selected and demonstrated. All alert and notification activities along the route should be simulated (e.g., the message that would actually be used is read for the evaluator, but not actually broadcast) as agreed upon in the extent of play. Actual testing of the Public Address system will be conducted at some agreed upon location.

State of Maryland Extent of Play:
These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. Siren activation (simulated) is coordinated so that one county activates sirens for the other two risk jurisdictions.

Back up Route Alerting
The designated route alerting player will provide transportation for the evaluator to the staging area however timing of the back-up route should only begin after the designated participant is in the staging area – not during transit form the respective County EOC. One back-up route alerting route will be demonstrated in each risk county.

Locations evaluated;
Calvert, St. Mary's and Dorchester Counties

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 5: EMERGENCY NOTIFICATION AND PUBLIC INFORMATION

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to disseminate to the public appropriate emergency information and instructions including any recommended protective actions. In addition, NUREG-0654 provides that OROs should ensure the capability exists for providing information to the media. This includes the availability of a physical location for use by the media during an emergency. NUREG-0654 also provides that a system be available for dealing with rumors. This system will hereafter be known as the public inquiry hotline.

EXTENT OF PLAY

Subsequent emergency information and instructions should be provided to the public and the media in a timely manner **(will not be subject to specific time requirements)**. For exercise purposes, timely is defined as "the responsible ORO personnel/representatives demonstrate actions to disseminate the appropriate information/instructions with a sense of urgency and without undue delay." If message dissemination is to be identified as not having been accomplished in a timely manner, the evaluator(s) will document a specific delay or cause as to why a message was not considered timely.

The OROs should ensure that emergency information and instructions are consistent with protective action decisions made by appropriate officials. The emergency information should contain all necessary and applicable instructions (e.g., evacuation instructions, evacuation routes, reception center locations, what to take when evacuating, information concerning pets, shelter-in-place instructions, information concerning protective actions for schools and special populations, public inquiry telephone number, etc.) to assist the public in carrying out protective action decisions provided to them. OROs should demonstrate the capability to use language that is clear and understandable to the public within both the plume and ingestion pathway EPZs. This includes demonstration of the capability to use familiar landmarks and boundaries to describe protective action areas.

The emergency information should be all-inclusive by including previously identified protective action areas that are still valid as well as new areas. The OROs should demonstrate the capability to ensure that emergency information that is no longer valid is rescinded and not repeated by broadcast media. In addition, the OROs should demonstrate the capability to ensure that current emergency information is repeated at pre-established intervals in accordance with the plan and/or procedures.

OROs should demonstrate the capability to develop emergency information in a non-English language when required by the plan and/or procedures.

If ingestion pathway measures are exercised, OROs should demonstrate that a system exists for rapid dissemination of ingestion pathway information to pre-determined individuals and businesses in accordance with the ORO's plan and/or procedures.

OROs should demonstrate the capability to provide timely, accurate, concise, and coordinated information to the news media for subsequent dissemination to the public. This would include demonstration of the capability to conduct timely and pertinent media briefings and distribute media releases as the situation warrants. The OROs should demonstrate the capability to respond appropriately to inquiries from the news media. All information presented in media briefings and media releases should be consistent with protective action decisions and other emergency information provided to the public. Copies of pertinent emergency information (e.g., EAS messages and media releases) and media information kits should be available for dissemination to the media.

OROs should demonstrate that an effective system is in place for dealing with calls to the public inquiry hotline. Hotline staff should demonstrate the capability to provide or obtain accurate information for callers or refer them to an appropriate information source. Information from the hotline staff, including information that corrects false or inaccurate information when trends are noted, should be included, as appropriate, in emergency information provided to the public, media briefings, and/or media releases.

State of Maryland Extent of Play:
These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. At least one media briefing will be conducted. Public inquiry calls will be initiated at a Site Area Emergency classification. Each location will receive at least six calls. Special News Broadcasts will be developed at appropriate centers but actual broadcast of these messages will not take place.

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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Locations evaluated;

Media Briefings

State and Calvert County - CCNPP Joint Information Center, Barstow, MD
St. Mary's County Governmental Office, Leonardtown, MD
Dorchester Counties Emergency Operations Center / Sheriff's Office Cambridge, MD

Rumor Control

State - Emergency Operations Center, Reisterstown, MD
Calvert County – Calvert County Emergency Operations Center, Prince Frederick
St Mary's County – Emergency Operations Center. Leonardtown, MD
Dorchester County – Emergency Operations Center. Cambridge, MD

Outstanding Issues

None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

EVALUATION AREA 6: SUPPORT OPERATION/FACILITIES

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

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the capability to implement radiological monitoring and decontamination of evacuees and emergency workers, while minimizing contamination of the facility, and registration of evacuees at reception centers.

EXTENT OF PLAY

Radiological monitoring, decontamination, and registration facilities for evacuees/ emergency workers should be set up and demonstrated as they would be in an actual emergency or as indicated in the extent of play agreement. This would include adequate space for evacuees' vehicles. Expected demonstration should include 1/3 of the monitoring teams/portal monitors required to monitor 20% of the population allocated to the facility within 12 hours. Prior to using a monitoring instrument(s), the monitor(s) should demonstrate the process of checking the instrument(s) for proper operation.

Staff responsible for the radiological monitoring of evacuees should demonstrate the capability to attain and sustain a monitoring productivity rate per hour needed to monitor the 20% emergency planning zone (EPZ) population planning base within about 12 hours. This monitoring productivity rate per hour is the number of evacuees that can be monitored per hour by the total complement of monitors using an appropriate monitoring procedure. A minimum of six individuals per monitoring station should be monitored, using equipment and procedures specified in the plan and/or procedures, to allow demonstration of monitoring, decontamination, and registration capabilities. The monitoring sequences for the first six simulated evacuees per monitoring team will be timed by the evaluators in order to determine whether the twelve-hour requirement can be meet. Monitoring of emergency workers does not have to meet the twelve-hour requirement. However, appropriate monitoring procedures should be demonstrated for a minimum of two emergency workers.

Decontamination of evacuees/emergency workers may be simulated and conducted by interview. The availability of provisions for separately showering should be demonstrated or explained. The staff should demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs and appropriate means (e.g. partitions, roped-off areas) to separate clean from potentially contaminated areas. Provisions should also exist to separate contaminated and uncontaminated individuals, provide changes of clothing for individuals whose clothing is contaminated, and store contaminated clothing and personal belongings to prevent further contamination of evacuees or facilities. In addition, for any individual found to be contaminated, procedures should be discussed concerning the handling of potential contamination of vehicles and personal belongings.

Monitoring personnel should explain the use of action levels for determining the need for decontamination. They should also explain the procedures for referring evacuees who cannot be adequately decontaminated for assessment and follow up in accordance with the ORO's plans and procedures. Contamination of the individual will be determined by controller inject and not simulated with any low-level radiation source.

The capability to register individuals upon completion of the monitoring and decontamination activities should be demonstrated. The registration activities demonstrated should include the establishment of a registration record for each individual, consisting of the individual's name, address, results of monitoring, and time of decontamination, if any, or as otherwise designated in the plan. Audio recorders, camcorders, or written records are all acceptable means for registration.

State of Maryland Extent of Play:
This element will be evaluated as an out-of-sequence activity. Facility set up at the Monitoring and Decontamination centers will only include the initial monitoring location and the actual decontamination area. Barriers and floor coverings for the hallways will be available for inspection but will not be established.

Locations evaluated;
Calvert County – Huntingtown High School
St Mary's County – Leonardtown High School
Dorchester County - Dorchester County Career and Technology

Outstanding Issues
None

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the capability to implement radiological monitoring and decontamination of emergency worker equipment, including vehicles.

EXTENT OF PLAY

The monitoring staff should demonstrate the capability to monitor equipment, including vehicles, for contamination in accordance with the ORO's plans and procedures. Specific attention should be given to equipment, including vehicles, that was in contact with individuals found to be contaminated. The monitoring staff should demonstrate the capability to make decisions on the need for decontamination of equipment including vehicles based on guidance levels and procedures stated in the plan and/or procedures.

The area to be used for monitoring and decontamination should be set up as it would be in an actual emergency, with all route markings instrumentation, record keeping and contamination control measures in place. Monitoring procedures should be demonstrated for a minimum of one vehicle. It is generally not necessary to monitor the entire surface of vehicles. However, the capability to monitor areas such as air intake systems, radiator grills, bumpers, wheel wells, tires, and door handles should be demonstrated. Interior surfaces of vehicles that were in contact with individuals found to be contaminated should also be checked.

Decontamination capabilities, and provisions for vehicles and equipment that cannot be decontaminated, may be simulated and conducted by interview.

State of Maryland Extent of Play:
This objective will be demonstrated as an out-of sequence activity.

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Homeland Security Exercise and Evaluation Program (HSEEP)

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Locations evaluated;
Calvert County – Barstow Landfill / Stafford Road
St Mary's County – Leonardtown High School
Dorchester County - Dorchester County Career and Technology

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

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EVALUATION AREA 6: SUPPORT OPERATION/FACILITIES

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.)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs demonstrate the capability to establish relocation centers in host areas. Congregate care is normally provided in support of OROs by the American Red Cross under existing letters of agreement.

EXTENT OF PLAY

Under this criterion, demonstration of congregate care centers may be conducted out of sequence with the exercise scenario. The evaluator should conduct a walk-through of the center to determine, through observation and inquiries, that the services and accommodations are consistent with ARC 3031 **In this simulation, it is not necessary to set up operations, as they would be in an actual emergency.** Alternatively, capabilities may be demonstrated by setting up stations for various services and providing those services to simulated evacuees. Given the substantial differences between demonstration and simulation of this criterion, exercise demonstration expectations should be clearly specified in extent-of-play agreements.

Congregate care staff should also demonstrate the capability to ensure that evacuees have been monitored for contamination, have been decontaminated as appropriate, and have been registered before entering the facility. This capability may be determined through an interview process.

If operations at the center are demonstrated, material that would be difficult or expensive to transport (e.g., cots, blankets, sundries, and large-scale food supplies) need not be physically available at the facility(ies). However, availability of such items should be verified by providing the evaluator a list of sources with locations and estimates of quantities.

Radiological Emergency Preparedness (REP)/
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State of Maryland Extent of Play:
This objective will be demonstrated as an out-of sequence activity and will be completed via an administrative interview at the Respective County EOC.

Locations evaluated;
Calvert County Emergency Operations Center, Prince Frederick, MD
St Mary's County Emergency Operations Center, Leonardtown, MD
Dorchester County Emergency Operations Center, Cambridge, MD

Outstanding Issues
None

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Annex 1

State Evaluation Locations

Maryland Emergency Management Agency - State Emergency Operations Center
Camp Fretterd Military Reservation, 5401 Rue Saint Lo Drive Reisterstown, MD 21136

Maryland Department of the Environment
1800 Washington Blvd. Suite 105, Baltimore, MD 21230-1721

Joint Information Center / Emergency Operations Facility
100 Skipjack Road, Prince Frederick, MD 20678

Calvert County Evaluation Locations

Calvert County EOC
175 Main Street Prince Frederick, MD 20678

Huntingtown High School (Reception / Mass Care)
4125 Solomons Island Rd Huntingtown, MD 20639

Stafford Road Landfill (Emergency Worker Decontamination)
350 Stafford Road, Prince Frederick, MD 20678

Patuxent High School (Risk School)
12485 Southern Connector Blvd. Lusby, MD 20657

Dowell Elementary (Risk School)
12680 HG Trueman Rd Lusby, Maryland 20657

Mutual Elementary (Risk School)
1455 Ball Road, Port Republic, MD 20676

Radiological Emergency Preparedness (REP)/
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St. Mary's County Evaluation Locations

St Mary's County EOC
23090 Leonard Hall Drive, Rt. 245 Leonardtown Hollywood Road Leonardtown, MD 20650

Leonardtown High School (Reception)
23995 Point Lookout Road, Leonardtown, Maryland, 20650

Hollywood Elementary (Risk School)
44345 Joy Chapel Road
Hollywood, Maryland 20636

Town Creek Elementary (Risk School)
45805 Dent Drive
Lexington Park, MD 20653

Dorchester County Evaluation Location

Dorchester County EOC
829 Fieldcrest Road Cambridge, MD 21613

Reception Center - Dorchester County Career and Technology (Center 2465 Cambridge Beltway, Cambridge, Md. 21613)

Annex 2

A&N	Alert and Notification
AAC	Accident Assessment Center
ACP	Access Control Point
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARES	Amateur Radio Emergency Service
ATL	Assistant Team Leader
CCNPP	Calvert Cliffs Nuclear Power Plant
CFR	Code of Federal Regulations
cpm	Counts per minute
DHMH	Department of Health and Mental Hygiene
DHS	Department of Homeland Security
DNR	Department of Natural Resources
DRD	Direct Reading Dosimeter
EAL	Emergency Action Level
EAS	Emergency Alert System
EBS	Emergency Broadcast System
ECL	Emergency Classification Level
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPZ	Emergency Planning Zone
ES	Elementary School
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
FR	Federal Register
FRERP	Federal Radiological Emergency Response Plan
FRMAC	Federal Radiological Monitoring and Assessment Center
HS	High School
HpGe	High Purity Germanium

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ICF	ICF International
IPCC	Ingestion Pathway Coordinating Committee
IPZ	Ingestion Pathway Emergency Planning Zone
JIC	Joint Information Center
KI	Potassium Iodide
mR/h	Milliroentgen(s) Per Hour
MDE	Maryland Department of the Environment
MEMA	Maryland Emergency Management Agency
MS	Middle School
MS-1	Medical Services Drill
MW	Megawatt
NRC	U.S. Nuclear Regulatory Commission
NUREG-0654	NUREG-0654/FEMA-REP-1, Rev. 1 (Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants), November 1980
ORO	Offsite Response Organization
PAD	Protective Action Decision
PAG	Protective Action Guidance
PAR	Protective Action Recommendation
PRD	Permanent Record Dosimeter
R	Roentgen(s)
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Services
Rem	Roentgen Equivalent Man
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
R/hr	Roentgens per hour
SAE	Site Area Emergency
SD	School District
SEOC	State Emergency Operations Center

Radiological Emergency Preparedness (REP)/
Homeland Security Exercise and Evaluation Program (HSEEP)

ExPlan **CALVEX 2011**

TCP	Traffic Control Point
TL	Team Leader
TSC	Technical Support Center
TTL	Technical Team Lead
TWP	Township

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