



FEMA

FINAL EXERCISE REPORT

CALVERT CLIFFS NUCLEAR POWER PLANT PLUME PHASE EXERCISE

Licensee: Constellation Energy Group

Exercise Date: April 13, 2004

Report Date: June 14, 2004

**FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION III
ONE INDEPENDENCE MALL, 6TH FLOOR
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I. EXECUTIVE SUMMARY

On April 13, 2004, an exercise was conducted in the 10-mile plume exposure pathway emergency planning zone (EPZ) around the Calvert Cliffs Nuclear Power Plant by the Department of Homeland Security Federal Emergency Management Agency (FEMA), Region III. Out-of-sequence demonstrations of reception center—monitoring, decontamination, and registration, congregate care, and emergency worker, equipment and vehicle—monitoring and decontamination activities, as well as the implementation of school protective actions, were also conducted on April 13, 2004. The purpose of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency. The exercise and out-of-sequence demonstrations were held in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans (RERPs) and procedures.

The most recent full-scale exercise at this site was conducted on September 9, 2002. A post-plume phase exercise was conducted in the ingestion pathway EPZ on October 22-24, 2003 and October 28-30, 2004. The qualifying emergency preparedness exercise was conducted on October 30, 1981.

FEMA wishes to acknowledge the efforts of the many individuals in Calvert County, St. Mary's County, and Dorchester County who participated in 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 volunteered to provide vital emergency services to their communities. Cooperation and teamwork of all the participants were evident during this exercise.

This report contains the final evaluation of the biennial exercise and the evaluation of the following out-of-sequence activities:

- *Reception Center – Monitoring, Decontamination, and Registration:* Conducted on between 1330 and 1700 on April 13, 2004, in Calvert, St. Mary's, and Dorchester counties.
- *Congregate Care:* Conducted between 1330 and 1700 on April 13, 2004, in Calvert, St. Mary's, and Dorchester counties.
- *Emergency Workers, Equipment, and Vehicles – Monitoring and Decontamination:* Conducted on between 1330 and 1700 on April 13, 2004, in Calvert, St. Mary's, and Dorchester counties.
- *School Interviews:* Conducted between 0800 and 1200 on April 13, 2004, in Calvert and St. Mary's County.

The local organizations, except where noted in this report, demonstrated knowledge of their emergency response plans and adequately implemented them. No Deficiencies, two Areas Requiring Corrective Action (ARCAs), and four planning issues were identified as a result of this exercise; one of the ARCAs identified was successfully resolved through redemonstration.

In addition, one prior issue and one prior planning issue were evaluated and successfully resolved during this exercise.

II. INTRODUCTION

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead responsibility for all offsite nuclear planning and response. FEMA's activities are 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 established following the Three Mile Island Nuclear Power Station accident in March 1979.

FEMA Rule 44 CFR 350 establishes the policies and procedures for FEMA's initial and continued approval of tribal, 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 (44 CFR Part 354, Appendix A, September 14, 1993); and
- Coordinating the activities of Federal agencies with responsibilities in the radiological emergency planning process:
 - U.S. Department of Agriculture,
 - U.S. Department of Commerce,
 - U.S. Department of Energy,
 - U.S. Department of Health and Human Services,
 - U.S. Department of the Interior,
 - U.S. Department of Transportation,
 - U.S. Environmental Protection Agency,
 - U.S. Food and Drug Administration, and
 - U.S. Nuclear Regulatory Commission.

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

The State of Maryland formally submitted their RERPs for the Calvert Cliffs Nuclear Power Plant (CCNPP) to FEMA Region III. Formal FEMA approval, under 44 CFR 350, was granted on August 8, 1985.

A REP exercise was conducted on April 13, 2004, by FEMA Region III to assess the capabilities of State and local emergency preparedness organizations in implementing their RERPs and procedures to protect the public health and safety during a radiological emergency involving the CCNPP. The purpose of this exercise report is to present the exercise results and findings on the performance of the off-site response organizations (ORO) during a simulated radiological emergency.

The findings presented in this report are based on the evaluations of the Federal evaluator team, with final determinations made by the FEMA Region III RAC Chairperson, and approved by the Regional Director.

Exercise reports are provided to the NRC, participating States, and FEMA Headquarters. State and local governments use the findings contained in the reports to plan, train, and improve 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 Preparedness: Alert and Notification," September 12, 2001; and
- 67 FR 20580, "FEMA Radiological Emergency Preparedness: Exercise Evaluation Methodology," April 25, 2002.

Section III of this report, "Exercise Overview," presents basic information and data relevant to the exercise. The section contains a description of the plume exposure pathway EPZ, and a listing of all participating jurisdictions and functional entities evaluated.

Section IV of this report, "Exercise Evaluation and Results," 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 Areas Requiring Corrective Action (ARCA) assessed during this exercise, recommended corrective actions, and the State and local governments' response or schedule of corrective actions for each identified exercise issue, and (2) descriptions of ARCAs assessed during previous exercises and the status of the OROs' efforts to resolve them.

III. EXERCISE OVERVIEW

This section of the exercise report contains data and basic information relevant to April 13, 2004 biennial exercise to test the offsite emergency response capabilities in area surrounding the Calvert Cliffs Nuclear Power Plant (CCNPP). This section includes a description of the plume exposure pathway EPZ, a listing of all participating jurisdictions and functional entities that were evaluated, and a tabular presentation of the time of actual occurrence of key exercise events and activities.

A. Plume Exposure Pathway Emergency Planning Zone Description

CCNPP is located near Maryland Highway 2-4 in Calvert County, Maryland, on the west bank of the Chesapeake Bay near Lusby, Maryland. The coordinates of the site are 38°25'39.7" North and 76°26'45" West. 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 units 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. 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 fraction 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 50,058 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.

B. Exercise Participants

The following agencies, organizations, and units of government participated in the CCNPP exercise on April 13, 2004, and related out-of-sequence demonstrations.

FEDERAL AGENCIES

Naval Air Warfare Center

U.S. Department of Agriculture (Farm Services Agency)

U.S. Department of the Navy Emergency Management

STATE OF MARYLAND

Maryland Department of Agriculture

Maryland Department of Health and Mental Hygiene

Maryland Department of Health, Division of Environmental Health

Maryland Department of Natural Resources

Maryland Department of Social Services

Maryland Department of State Highway Administration

Maryland Department of Transportation

Maryland Emergency Management Agency

Maryland State Police

RISK JURISDICTIONS

CALVERT COUNTY

Calvert County Department of Education

Calvert County Department of Public Health

Calvert County Department of Transportation

Calvert County Emergency Management Agency

Calvert County Fire, Rescue, and EMS

Calvert County Health Department

Calvert County Parks and Recreation Department

Calvert County Public Facilities

Calvert County Public Schools

Calvert County Public Works Department

Calvert County Radiological Officer

Calvert County Roads

Calvert County Sheriff's Office

Calvert County Social Services

DORCHESTER COUNTY

City of Cambridge Police Department

Dorchester County Board of Education

Dorchester County Department of Environmental Health

Dorchester County Department of Health

Dorchester County Department of Public Works

Dorchester County Department of Social Services

Dorchester County Emergency Management Agency
Dorchester County Fire and Rescue
Dorchester County Highway Department
Dorchester County Public Schools
Dorchester County Sheriff's Department

ST. MARY'S COUNTY

St. Mary's County Attorney's Office
St. Mary's County Administrator
St. Mary's County Board of Education
St. Mary's County Department of Parks and Recreation
St. Mary's County Department of Public Works and Transportation
St. Mary's County Department of Social Services
St. Mary's County Emergency Management Agency
St. Mary's County Fire Department
St. Mary's County Health Department
St. Mary's County Metropolitan Commissioner
St. Mary's County Public Schools
St. Mary's County Public Schools, Transportation Services
St. Mary's County Sheriff's Office

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross
Bishop Bus Service
Calvert County Employee Family Association
Calvert County Memorial Hospital
Calvert Cliffs Nuclear Power Plant Representative
Civil Air Patrol
Dominion Cove Point LNP
Dorchester General Hospital
Leonardtown Volunteer Fire Department
Lexington Park Rescue Squad
St. Mary's Hospital
St. Mary's Radio Emergency Associate Communicator Team
Town of Leonardtown

C. Exercise Timeline

Table 1, on the following page, presents the time at which key events and activities occurred during the Calvert Cliffs Nuclear Power Plant exercise on April 13, 2004. Also included are times that notifications were made to the participating jurisdictions/functional entities.

TABLE 1. EXERCISE TIMELINE

DATE AND SITE: *April 13, 2004, Calvert Cliffs Nuclear Power Station*

Emergency Classification Level or Event	Time Utility Declared	Time Notification Was Received or Action Was Taken		
		Calvert County	St. Mary's County	Dorchester County
Unusual Event	0800	0801	0801	0802
Alert	0815	0820	0817	0816
Site Area Emergency	1010	1011	1015	1012
General Emergency	1115	1116	1123	1115
Simulated Radiation Release Started	1115	1115	1123	1115
Simulated Radiation Release Terminated		N/A	N/A	N/A
Facility Declared Operational		0846	0910	0900
Declaration of State of Emergency		Local 1032	Local 1056	NA
Exercise Terminated		1230	1240	1238
Precautionary Actions: Place livestock on stored feed and covered water with in the 10-mile EPZ		1035	1035	1035
1st A&N Decision (Local [made])		1035	1035	1035
1st Siren Activation		1045	1045	1045
1st EAS or EBS Message		1048	1048	1048
2nd A&N Decision (Local [made]) Shelter: Shelter Zones 4, 5, 6 and 7 Evacuate: Evacuate Zones 1, 2, 3, and 8		1142	1142	1142
2nd Siren Activation		1152	1152	1152
2nd EAS or EBS Message		1155	1155	1155
KI Administration Decision to take KI – General Public		1142	1142	1142
KI Administration Decision to take KI – Emergency Workers/Special Populations		1142	1050 ¹ 1142	1142
KI Administration Decision not to take KI – General Public		N/A	N/A	N/A
KI Administration Decision not to take KI – Emergency Workers/Special Populations		N/A	N/A	N/A

N/A – Not Applicable

¹County Medical Officer made early KI administration decision to take KI for emergency workers.

IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and locations that participated in the April 13, 2004, biennial 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 FEMA Radiological Emergency Preparedness (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 3 of this report.

A. Summary Results of Exercise Evaluation

The matrix presented in Table 2, on the following pages, presents the status of the exercise evaluation area criteria from the FEMA 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 Areas Requiring Corrective Action (ARCAs) assessed and no unresolved ARCAs from prior exercises)
- A ARCA(s) assessed
- A¹ ARCA(s) assessed, but successfully redemonstrated

B. Status of Jurisdictions Evaluated

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

- **Met** – Listing of the demonstrated exercise evaluation area criteria under which no Deficiencies or ARCAs were assessed during this exercise and under which no ARCAs assessed during prior exercises remain unresolved.
- **Deficiency** – Listing of the demonstrated exercise evaluation area criteria under which one or more Deficiencies were assessed during this exercise. Included is a description of each Deficiency and recommended corrective actions.
- **Area Requiring Corrective Action** – Listing of the demonstrated exercise evaluation area criteria under which one or more ARCAs were assessed during the current exercise. Included is a description of the ARCAs assessed during this exercise and the recommended corrective actions to be demonstrated before or during the next biennial exercise.
- **Not Demonstrated** – Listing of the exercise evaluation area criteria that were not scheduled to be demonstrated during this exercise and the reason they were not demonstrated.
- **Prior ARCAs – Resolved** – Descriptions of ARCAs assessed during previous exercises that were resolved in this exercise and the corrective actions demonstrated.
- **Prior ARCAs – Unresolved** – Descriptions of ARCAs assessed during prior exercises that were not resolved in this exercise. Included are the reasons the ARCAs remain unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

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

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

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

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

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

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

1. Risk Jurisdictions

1.1 Calvert County

1.1.1 Calvert County Emergency Operations Center

- a. **MET:** 1.a.1 2.a.1 3.a.1 4.a.2 5.a.1
 1.c.1 2.b.2 3.b.1 5.a.3
 1.d.1 2.c.1 3.c.1 5.b.1
 1.e.1 3.c.2
 3.d.1
 3.d.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None

e. PRIOR ARCAs – RESOLVED: 3.b.1

Issue No.: 11-02-14-A-01 (3.b.1)

Description: The Field Monitoring Team (FMT) did not receive instructions to ingest potassium iodide (KI). As a result, the FMT did not ingest KI in accordance with the direction of the County Health Official. (NUREG-0654, J.10.e, f)

Corrective Action Demonstrated: During the exercise conducted on April 13, 2004, the County Health Officer ensured the field monitoring team and all emergency workers were notified to take KI after the decision was made at 1142.

f. PRIOR ARCAs – UNRESOLVED: N/A

1.1.2 Field Monitoring Team

a. MET: 1.d.1 3.a.1 4.a.1
1.e.1 3.b.1 4.a.3

b. DEFICIENCY: None

c. AREAS REQUIRING CORRECTIVE ACTION: None

d. NOT DEMONSTRATED: None

e. PRIOR ARCAs – RESOLVED: N/A

f. PRIOR ARCAs – UNRESOLVED: N/A

1.1.3 Reception Center (Calvert H.S.)

a. MET: 1.e.1 3.a.1 6.a.1

b. DEFICIENCY: None

c. AREAS REQUIRING CORRECTIVE ACTION: None

d. NOT DEMONSTRATED: None

e. PRIOR ARCAs – RESOLVED: N/A

f. PRIOR ARCAs – UNRESOLVED: N/A

1.1.4 Congregate Care Center (Plume Point M.S.)

- a. **MET:** 1.b.1 6.c.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A
- g. **PRIOR PLANNING ISSUES – RESOLVED:** 6.c.1

Issue No.: 11-02-19-P-01 (6.c.1)

Description: The list of mass care centers in the Calvert County Radiological Emergency Plan and Standard Operating Procedures is not accurate (Attachment 13, American Red Cross: Standard Operating Procedures, Tab C [April 2002]). The plan does not include the Plume Point Elementary/Middle School Complex or the Windy Hill Elementary/Middle School Complex. It does list four elementary schools that the American Red Cross – Calvert County Chapter (ARC-CC) would not normally use (kitchen facilities are not adequate for extended mass care). The June 2001 plan was correct; however, the April 2002 plan was incorrectly modified. (NUREG-0654, J.10.d, h; J.12)

Corrective Action Demonstrated: The Plan has been corrected to include the Plume Point Elementary/Middle School Complex or the Windy Hill Elementary/Middle School Complex.

1.1.5 Emergency Worker Decontamination Station (Stafford Landfill)

- a. **MET:** 1.e.1 3.a.1 6.a.1
6.b.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None

- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.1.6 Route Alerting Team

- a. **MET:** 1.d.1 3.a.1 5.a.3
1.e.1 3.b.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.1.7 Traffic Control Point/Access Control Point

- a. **MET:** 1.e.1 3.a.1
3.b.1
3.d.1
3.d.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.1.8 School District (Patuxent H.S.)

- a. **MET:** 3.c.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None

- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.1.9 School District (Dowell E.S.)

- a. **MET:** 3.c.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.1.10 School District (Mutual E.S.)

- a. **MET:** 3.c.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2 St. Mary’s County

1.2.1 Emergency Operations Center

- a. **MET:** 1.a.1 2.a.1 3.a.1 4.a.2 5.a.1
 1.d.1 2.b.2 3.b.1 5.b.1
 1.e.1 2.c.1 3.c.1
 3.c.2
 3.d.1
 3.d.2

- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** 1.c.1

Issue No.: 11-04-1.c.1-A-01

Condition: The school districts within St. Mary’s County were not provided with timely information concerning the emergency classification level (ECL). The Alert ECL was received at 0817 hours at the Emergency Operations Center (EOC) and not transmitted to the school district until 1010 hours.

Possible Cause: Due to the late arrival of the School Coordinator at the EOC, the schools within St. Mary’s County were not provided with timely information.

Reference: NUREG-0654, A.1.d; A.2.a, b

Effect: The late arrival of essential information could have affected the health and safety of the school children and staff of the St. Mary’s Public Schools.

Recommendation: Should an individual be tardy, a replacement should fulfill his duties and responsibilities.

Schedule of Corrective Actions: St. Mary's County will designate alternate personnel to fulfill duties for any of the EOC representatives that cannot respond to the emergency center in a timely manner.

- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.2 Field Monitoring Team

- a. **MET:** 1.d.1 3.a.1 4.a.1
1.e.1 3.b.1 4.a.3
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A

f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.3 Reception Center (Leonard Hall Drill Hall)

a. **MET:** 3.a.1 6.a.1

b. **DEFICIENCY:** None

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

d. **NOT DEMONSTRATED:** None

e. **PRIOR ARCAs – RESOLVED:** N/A

f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.4 Congregate Care Center (Leonard Hall Drill Hall)

a. **MET:** 1.b.1 6.c.1

b. **DEFICIENCY:** None

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

d. **NOT DEMONSTRATED:** None

e. **PRIOR ARCAs – RESOLVED:** N/A

f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.5 Emergency Worker Decon. Station (Leonard Hall Drill Hall)

a. **MET:** 1.e.1 3.a.1 6.a.1
6.b.1

b. **DEFICIENCY:** None

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

d. **NOT DEMONSTRATED:** None

e. **PRIOR ARCAs – RESOLVED:** N/A

f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.6 Route Alerting Team

- a. **MET:** 1.d.1 3.a.1 5.a.3
1.e.1 3.b.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.7 Traffic Control Point/Access Control Point

- a. **MET:** 1.e.1 3.a.1
3.b.1
3.d.1
3.d.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.8 School District (Esperanza M.S.)

- a. **MET:** 3.c.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.2.9 School District (Green Holly E.S.)

- a. **MET:** 3.c.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3 Dorchester County

1.3.1 Emergency Operations Center

- a. **MET:** 1.a.1 2.a.1 3.a.1 4.a.2 5.a.1
1.c.1 2.b.2 3.b.1 5.a.3
1.d.1 2.c.1 3.c.1 5.b.1
1.e.1 3.c.2
3.d.1
3.d.2
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3.2 Field Monitoring Team

- a. **MET:** 1.d.1 3.a.1 4.a.1
1.e.1 3.b.1 4.a.3
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None

- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3.3 Reception Center (Maple E.S.)

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

Issue No.: 11-04-6.a.1-A-02

Condition: The radiation monitor at the Reception Center used a non-operational, hand-held radiation detector.

Possible Cause: Radiation monitors did not follow proper procedures, nor did supervisory personnel verify proper use of equipment.

Reference:

- NUREG-0654, J.10.h, K.5.b
- Dorchester County Plan, Tab C-2, “Procedures for Monitors,” Step 3.0

Effect: If not corrected, a contaminated individual could have been allowed into the Congregate Care Center, potentially contaminating the facility and other evacuees. As a result, all of the evacuees would have had to be re-monitored, and the facility checked for contamination. If the Congregate Care Center was found to be contaminated, time consuming and inconvenient decontamination would have had to take place, or another facility would have had to be found for Congregate Care Center.

Recommendation: Radiation monitors should receive additional training in the use of radiation detectors. Ensure procedure, Tab C-2, “Procedures for Monitors,” Step 3.0, is reviewed and that proper equipment checks are performed.

Corrective Action Demonstrated: Monitoring personnel conducted operational checks on different radiation detectors that were used to monitor evacuees.

- d. **NOT DEMONSTRATED:** None

- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3.4 Congregate Care Center (Cambridge-South Dorchester H.S.)

- a. **MET:** 1.b.1 6.c.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3.5 Emergency Worker Decon. Station (Maple E.S.)

- a. **MET:** 1.e.1 3.a.1 6.a.1
6.b.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None
- e. **PRIOR ARCAs – RESOLVED:** N/A
- f. **PRIOR ARCAs – UNRESOLVED:** N/A

1.3.6 Route Alerting Team

- a. **MET:** 1.d.1 3.a.1 5.a.3
1.e.1 3.b.1
- b. **DEFICIENCY:** None
- c. **AREAS REQUIRING CORRECTIVE ACTION:** None
- d. **NOT DEMONSTRATED:** None

- e. **PRIOR ARCAs – RESOLVED: N/A**
- f. **PRIOR ARCAs – UNRESOLVED: N/A**

1.3.7 Traffic Control Point/Access Control Point

- a. **MET: 1.e.1 3.a.1**
 - 3.b.1
 - 3.d.1
 - 3.d.2
- b. **DEFICIENCY: None**
- c. **AREAS REQUIRING CORRECTIVE ACTION: None**
- d. **NOT DEMONSTRATED: None**
- e. **PRIOR ARCAs – RESOLVED: N/A**
- f. **PRIOR ARCAs – UNRESOLVED: N/A**

APPENDIX 1 ACRONYMS AND ABBREVIATIONS

AAC	Accident Assessment Center
ACP	Access Control Point
ALARA	As Low As is Reasonably Achievable
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
CCNPP	Calvert Cliffs Nuclear Power Plant
CCNPPI	Calvert Cliffs Nuclear Power Plant, Inc.
CFR	Code of Federal Regulations
DOD	U.S. Department of Defense
EAS	Emergency Alert System
EBS	Emergency Broadcast System
ECL	Emergency Classification Level
EMS	Emergency Medical Service
EPA	U.S. Environmental Protection Agency
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Extent-of-Play
ERPIP	Emergency Response Plan Implementation Procedure
EPZ	Emergency Planning Zone
FEMA	Federal Emergency Management Agency
FRERP	Federal Radiological Emergency Response Plan
FRMAC	Federal Radiological Monitoring and Assessment Center
FMT	Field Monitoring Team
HPSI	High Pressure Safety Injection
IPCC	Ingestion Pathway Coordinating Center
ISFSI	Independent Spent Fuel Storage Installation
IPZ	Ingestion Pathway Zone
KI	Potassium Iodide
LOCA	Loss-of-Coolant Accident
LPSI	Low Pressure Safety Injection
MEMA	Maryland Emergency Management Agency
MDE	Maryland Department of the Environment

NAS	Naval Air Station
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 Guide
PAR	Protective Action Recommendation
PAZ	Protective Action Zone
R/hr	Roentgen(s) per hour
RAC	Regional Assistance Committee
RCS	Reactor Coolant System
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
SRD	Self-Reading Dosimeter
SLAS	Safety Injection Actuation Signal
TCP	Traffic Control Point
TL	Team Leader

APPENDIX 2 EXERCISE EVALUATORS AND TEAM LEADERS

The following is a list of the personnel who evaluated the Calvert Cliffs Nuclear Power Station Plume Phase Exercise on April 13, 2004. The “TL” indicates evaluator Team Leaders after their names. The organization each evaluator represents is indicated by the following abbreviations:

FEMA	Federal Emergency Management Agency
ICF	ICF Consulting

<u>POSITION</u>	<u>NAME</u>	<u>ORGANIZATION</u>
RAC Chairman	Darrell Hammons	FEMA
Project Officer	Yvette Porter	FEMA

PLUME PHASE EXERCISE – April 13, 2004

<u>EVALUATION SITE</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
STATE OF MARYLAND		
Accident Assessment (EOF)	Ken Wierman (Observer)	FEMA

INGESTION JURISDICTIONS

CALVERT COUNTY

Emergency Operations Center	Angela Hough (TL)	FEMA
	Patrick Twiss	FEMA
	Brenda Pittman	ICF
Field Monitoring Team	Arthur Ball	ICF
Reception Center (Calvert H.S.)	William Neidermeyer	ICF
Congregate Care Center (Plume Point M.S.)	Kevin Flynn	ICF
Emergency Worker Decon. Station (Stafford Landfill)	William Neidermeyer	ICF
Route Alerting Team	Barton Freeman	FEMA
TCP/ACP	Barton Freeman	FEMA
School District (Patuxent H.S.)	Lori Bainbridge	FEMA
School District (Dowell E.S.)	Thomas Blosser	FEMA
School District (Mutual E.S.)	Roger Kowieski	ICF

<u>EVALUATION SITE</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
RISK JURISDICTIONS (continued)		
ST. MARY'S COUNTY		
Emergency Operations Center	Albert Lookabough (TL)	ICF
Field Monitoring Team	Jan Jackson	ICF
Reception Center (Leonard Hall Drill Hall)	Harold Spedding	ICF
Congregate Care Center (Leonard Hall Drill Hall)	Jon Fox	ICF
Emergency Worker Decon. Station (Leonard Hall Drill Hall)	Patrick Taylor	ICF
Route Alerting Team	Patrick Taylor	ICF
TCP/ACP	Patrick Taylor	ICF
School District (Esperanza H.S.)	Nancy Johnson	ICF
School District (Green Holly E.S.)	Nancy Johnson	ICF
	Tom McCance	ICF
	Bill Edmonson	ICF
DORCHESTER COUNTY		
Emergency Operations Center	Al Henryson (TL)	FEMA
Field Monitoring Team	Larry Visniesky	ICF
Reception Center (Maple E.S.)	Thomas Deaner	ICF
Congregate Care Center (Cambridge-South Dorchester H.S.)	James Martin	ICF
Emergency Worker Decon. Station (Maple E.S.)	Gary Goldberg	ICF
Route Alerting Team	Gary Goldberg	ICF
TCP/ACP	Gary Goldberg	ICF
	Landton Malone	FEMA
	Landton Malone	FEMA

APPENDIX 3

EXERCISE EVALUATION AREA CRITERIA AND EXTENT-OF-PLAY AGREEMENT

This appendix lists the exercise evaluation area criteria that were scheduled for demonstration in the Calvert Cliffs Nuclear Power Plant (CCNPP) REP exercise on April 13, 2004 and the extent of play agreement approved by FEMA Region III on August 26, 2003.

The exercise evaluation area criteria, contained in the “FEMA Radiological Emergency Preparedness Exercise Evaluation Methodology”, 66 FR 47525, September 12, 2001, represent a functional translation of the planning standards and evaluation criteria of NUREG-0654/FEMA-REP-1, Rev. 1, “Criteria for the Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” November 1980.

Because the exercise evaluation area criteria are intended for use at all nuclear power plant sites, and because of variations among offsite plans and procedures, an extent of play agreement is prepared by the State and approved by FEMA to provide evaluators with guidance on expected actual demonstration of the evaluation area criteria.

A. Exercise Evaluation Area Criteria

Listed below are the specific radiological emergency preparedness (REP) evaluation area criteria scheduled for demonstration during this exercise.

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)

Sub-element 1.b – Facilities

Criterion 1.b.1: Facilities are sufficient to support the emergency response. (NUREG-0654, H.3)

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; A.2.a, b)

Sub-element 1.d – Communications Equipment

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

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.7, 10; J.10.a, b, e; J.11; K.3.a)

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 ensure 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, J.10.e, f; K.4)

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 onsite and offsite environmental conditions. (NUREG-0654, I.8, 10; Supp. 3)

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; J.10.f, m)

Sub-element 2.c – Protective Action Decisions 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; J.10.d, e)

EVALUATION AREA 3: 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.a, b)

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, J.10.e)

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, J.10.c, d, g)

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

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)

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

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.7, 8, 9)

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; H.12)

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

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.IV.D; NUREG-0654, E.5, 6, 7)

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)

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.c)

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, J.12; K.5.b)

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)

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; J.12)

B. Extent of Play Agreement

The extent of play agreement on the following pages was submitted by the State of Maryland, in cooperation with the Commonwealth of Virginia, and was approved by FEMA Region III on August 26, 2003, in preparation for the Calvert Cliffs Nuclear Power Plant (CCNPP) REP exercise on April 13, 2004. The extent of play agreement includes any significant modification or change in the level of demonstration of each exercise evaluation area criterion listed in Subsection A of this appendix.

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CALVEX '03
Ingestion Pathway Exercise

STATE OF MARYLAND

EXERCISE CRITERIA
AND
EXTENT OF PLAY

Approved

Director, Maryland Emergency Management Agency / Date

CALVERT CLIFFS NUCLEAR POWER PLANT
Maryland Jurisdictions

REVISION 1

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Calvert Cliffs Nuclear Power Plant CALVEX 03

Revision 1

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INTRODUCTION

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 and Ingestion Pathway graded exercise to be conducted on April 13, 2004.

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.

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

Out-of-sequence evaluations for plume phase activities will be conducted during the week of September 22, 2003 involving the three Calvert Cliffs risk jurisdictions in Maryland. These locations will be designated with an (*) with the associated objective. The activities to be demonstrated are:

- Special Facilities – Schools
- Reception Center Monitoring and Decontamination
- Emergency Worker, Equipment and Vehicles Monitoring and Decontamination
- Congregate Care
- Traffic and Access Control

Out-of-sequence evaluations for the ingestion phase activities will be conducted during the week of September 22, 2003 involving the thirteen Calvert Cliffs risk jurisdictions in Maryland, ten ingestion jurisdictions in Virginia and the District of Columbia. A separate document has been submitted to delineate the extent of play for these jurisdictions.

The full-scale graded plume phase exercise will be conducted on October 21st, 2003 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. The graded ingestion pathway activities will be conducted on October 22nd, 23rd and 24th, 2003.

Actions will be taken in accordance with each jurisdiction's county emergency plan and procedures unless specified under the specific extent of play.

State Locations

State EOF

Plume Zone Local Jurisdictions

Calvert County

Stafford Road Landfill (emergency worker station)

Calvert High School (reception center)

Plume Point Middle School (congregate care)

Patuxent High School (risk school)

Dowell Elementary School (risk school)

Mutual Elementary School (risk school)

St. Mary's County

Leonard Hall (reception, emergency worker, mass care)

Esperanza Middle School (risk school)

Green Holly Elementary School (risk school)

Dorchester County

Maple Elementary (reception, emergency worker)

South Cambridge High School (congregate care)

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.

Locations Evaluated:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

Outstanding Issues:

None

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:

Facilities will be set up based on the ORO's plans and procedures and demonstrated, as they would be in an actual emergency.

Locations Evaluated:

State EOF

Calvert County EOC, Congregate Care Center

St. Mary's County EOC, Congregate Care Center

Dorchester County EOC, Congregate Care 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, A.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:

Calvert County EOC

St. Mary's County EOC

Dorchester County EOC

Outstanding Issues:

State AAC—11-99-03-02 (corrected during the Nov. 19, 2002 Peach Bottom Atomic Power Station (PBAPS) exercise)

EVALUATION AREA 1: EMERGENCY OPERATIONS MANAGEMENT

Sub-element 1.d – Communications Equipment

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

ORO's 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 exist.

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. Communications with the Ingestion Jurisdictions will be validated during the Oct 21 plume phase exercise during notification of the site area and general emergency classifications. Receipt of the call will be verified by facsimile or e-mail.

Locations Evaluated:

State EOF

Calvert County EOC, Field Monitoring Team, Route Alerting Team

St. Mary's County EOC, Field Monitoring Team, Route Alerting Team

Dorchester County EOC, Field Monitoring Team, Route Alerting Team

Outstanding Issues:

None

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, J.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 emergency planning zone (EPZ).

Quantities of dosimetry and potassium iodide (KI) available and storage location(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.

Locations Evaluated:

Calvert County EOC, Field Monitoring Team, Reception Center, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP

St. Mary's County EOC, Field Monitoring Team, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP

Dorchester County EOC, Field Monitoring Team, Reception Center, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP

Outstanding Issues:

None

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 ensure 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 emergency planning zone (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 potassium iodide (KI), as a protective measure, based on the ORO's plan and/or procedures or projected thyroid dose compared with the established protective action guides (PAGs) for KI administration.

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:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

Outstanding Issues:
None

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 onsite and offsite 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, the 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 EOF

Outstanding Issues:

State AAC—11-99-07-03 (corrected during the Nov. 19, 2002 Peach Bottom Atomic Power Station (PBAPS) exercise)

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 (PAD) for the general public (including the recommendation for the use of KI, if that's the ORO's policy). (NUREG-0654, J.9, J.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

ORO should have the capability to make both initial and subsequent protective action decisions (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 protective action recommendations (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 potassium iodide (KI) will be used as a protective measure for the general public under offsite plans, then the ORO should demonstrate the capability to make decisions on the distribution and administration of potassium iodide (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 Sept 22 out-of-sequence evaluations)

Locations Evaluated:

Calvert County EOC

St. Mary's County EOC

Dorchester County EOC

Outstanding Issues:

None

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

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

Criterion 2.c.1 – Protective action decisions are made, as appropriate, for special population groups. (NUREG-0654, J.9, J.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 protective action guides (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.

Locations Evaluated:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

Outstanding Issues:

None

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

Sub-element 2.d – Radiological Assessment and Decision-Making for the Ingestion Exposure Pathway

Criterion 2.d.1 – Radiological consequences for the ingestion pathway are assessed and appropriate protective action decisions are made based on the ORO’s planning criteria. (NUREG-0654, I.8; J.11)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs have the means to assess the radiological consequences for the ingestion exposure pathway, relate them to the appropriate protective action guides (PAGs), and make timely, appropriate protective action decisions to mitigate exposure from the ingestion pathway.

During an accident at a nuclear power plant, a release of radioactive material may contaminate water supplies and agricultural products in the surround areas. Any such contamination would likely occur during the plume phase of the accident, and depending on the nature of the release could impact the ingestion pathway for weeks or years.

EXTENT OF PLAY

It is expected that the ORO will take precautionary actions to protect food and water supplies, or to minimize exposure to potentially contaminated water and food, in accordance with their respective plans and procedures. Often such precautionary actions are initiated by the OROs based on criteria related to the facility’s emergency classification levels (ECL). Such action may include recommendations to place milk animals on stored feed and to use protected water supplies.

The ORO should use its procedures (for example, development of a sampling plan) to assess the radiological consequences of a release on the food and water supplies. The ORO assessment should include the evaluation of the radiological analyses of representative samples of water, food, and other ingestible substances of local interest from potentially impacted areas, the characterization of the releases from the facility, and the extent of areas potentially impacted by the release. During this assessment, OROs should consider the use of agricultural and watershed data within the 50-mile emergency planning zone (EPZ). The radiological impacts on the food and water should then be compared to the appropriate ingestion PAGs contained in the ORO’s plan and/or procedures. (The plan and/or procedures may contain PAGs based on specific dose commitment criteria or based on criteria as recommended by current Food and Drug Administration guidance.) Timely and appropriate recommendations should be provided to the ORO decision-makers group for implementation decisions. As time permits, the ORO may also include a comparison of taking or not taking a given action on the resultant ingestion pathway dose commitments.

The ORO should demonstrate timely decisions to minimize radiological impacts from the ingestion pathway, based on the given assessments and other information available. Any

such decisions should be communicated and to the extent practical, coordinated with neighboring and local OROs.

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

State of Maryland Extent of Play:

Not evaluated for this exercise

EVALUATION AREA 2: PROTECTIVE ACTION DECISION-MAKING

Sub-element 2.e – Radiological Assessment and Decision-Making Concerning Relocation, Re-entry and Return

Criterion 2.e.1 – Timely, relocation, re-entry, and return decisions are made and coordinated as appropriate, based on assessments of the radiological conditions and criteria in the ORO’s plan and/or procedures. (NUREG-0654, A.1.b; I.10; M)

INTENT

The sub-element is derived from NUREG-0654, which provides that OROs have the capability to make decisions on relocation, re-entry, and return of the general public. These decisions are essential for the protection of the public from the direct long-term exposure to deposited radioactive materials from a severe accident at a commercial nuclear power plant.

EXTENT OF PLAY

Relocation: OROs should demonstrate the capability to estimate integrated dose in contaminated areas and to compare these estimates with PAGs, apply decision criteria for relocation of those individuals in the general public who have not been evacuated but where projected doses are in excess of relocation PAGs and control access to evacuated and restricted areas. Decisions are made for relocating members of the evacuated public who lived in areas that now have residual radiation levels in excess of the PAGs. Determination of areas to be restricted should be based on factors such as the mix of radionuclides in deposited materials, calculated exposure rates vs. the PAGs and field samples of vegetation and soil analyses.

Re-entry: Decisions should be made regarding the location of control points and policies regarding access and exposure control for emergency workers and members of the general public who need to temporarily enter the evacuated area to perform specific tasks or missions.

Examples of control procedures are the assignment of or checking for, direct reading and non direct-reading dosimeters for emergency workers; questions regarding the individual’s objectives and locations expected to be visited and associated time frames; availability of maps and plots of radiation exposure rates; advice on areas to avoid; and procedures for exit including: monitoring of individuals, vehicles, and equipment, decision criteria regarding decontamination; and proper disposition of emergency worker dosimeters and maintenance of emergency worker radiation exposure records.

Responsible OROs should demonstrate the capability to develop a strategy for authorized re-entry of individuals into the restricted zone, based on established decision criteria. OROs should demonstrate the capability to modify those policies for security purposes

(e.g., police patrols), for maintenance of essential services (e.g., fire protection and utilities), and for other critical functions. They should demonstrate the capability to use decision making criteria in allowing access to the restricted zone by the public for various reasons, such as to maintain property (e.g., to care for the farm animals or secure machinery for storage), or to retrieve important possessions. Coordinated policies for access and exposure control should be developed among all agencies with roles to perform in the restricted zone. OROs should demonstrate the capability to establish policies for provision of dosimetry to all individuals allowed to re-enter the restricted zone. The extent that OROs need to develop policies on re-entry will be determined by scenario events.

Return: Decisions are to be based on environmental data and political boundaries or physical/geological features, which allow identification of the boundaries of areas to which members of the general public may return. Return is permitted to the boundary of the restricted area that is based on the relocation PAG.

Other factors that the ORO should consider are, for example: conditions that permit the cancellation of the emergency classification level and the relaxation of associated restrictive measures, basing return recommendations (i.e., permitting populations that were previously evacuated to reoccupy their homes and businesses on an unrestricted basis) on measurements of radiation from ground deposition; and the capability to identify services and facilities that require restoration within a few days and to identify the procedures and resources for their restoration. Examples of these services and facilities are: medical and social services, utilities, roads, schools, and intermediate term housing for relocated persons.

State of Maryland Extent of Play:

Not evaluated for this exercise.

EVALUATION AREA 3: 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

ORO's 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 ORO's 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. ORO's 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 Annual Letter of Certification. Electronic dosimetry may be substituted for self-reading dosimeters (SRDs) at some State or local jurisdictions.

Locations Evaluated:

Calvert County EOC, Field Monitoring Team, Reception Center, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP
St. Mary's County EOC, Field Monitoring Team, Reception Center, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP
Dorchester County EOC, Field Monitoring Team, Reception Center, Emergency Worker Decon. Station, Route Alerting Team, TCP/ACP

Outstanding Issues:

11-97-24-A-07 State Sample Team "A" did not demonstrate good contamination control procedures, as they occasionally placed survey instruments and sample tools on potentially contaminated ground while samples were being taken.

EVALUATION AREA 3: 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 for the 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 radioprotective 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 potassium iodide (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 radioprotective 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.

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:

Calvert County EOC, Field Monitoring Team, Route Alerting Team, TCP/ACP
St. Mary's County EOC, Field Monitoring Team, Route Alerting Team, TCP/ACP
Dorchester County EOC, Field Monitoring Team, Route Alerting Team, TCP/ACP

Outstanding Issues:

Calvert County—11-02-14-A-01

Field Monitoring Teams did not receive instructions to take KI in accordance with the Director of the County Health Officer.

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, J.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. Some contacts with transportation providers should be actual, as negotiated in the extent of play. All actual and simulated contacts should be logged.

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.

Locations Evaluated:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

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 emergency classification level (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 during the week of September 22, 2003. There are no risk schools in Dorchester County. **This element will be evaluated as an out-of-sequence activity.**

Locations Evaluated:

Calvert County EOC, School Districts
St. Mary's County EOC, School Districts
Dorchester County EOC

Outstanding Issues:

None

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

ORO's 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. ORO's 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 ORO's 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 authority to control access.

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. **This element will be evaluated as an out-of-sequence activity at the respective County EOC's.**

Locations Evaluated:

Calvert County EOC, TCP/ACP
St. Mary's County EOC, TCP/ACP
Dorchester County EOC, TCP/ACP

Outstanding Issues:

None

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

ORO 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. **This element will be evaluated as an out-of-sequence activity at the respective County EOC's.**

Locations Evaluated:

Calvert County EOC, TCP/ACP
St. Mary's County EOC, TCP/ACP
Dorchester County EOC, TCP/ACP

Outstanding Issues:

None

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

Sub-element 3.e – Implementation of Ingestion Pathway Decisions

Criterion 3.e.1 – The ORO demonstrates the availability and appropriate use of adequate information regarding water, food supplies, milk, and agricultural production within the ingestion exposure pathway planning zone for implementation of protective actions. (NUREG-0654, J.9, 11)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to implement protective actions, based on criteria recommended by current Food and Drug Administration guidance, for the ingestion pathway emergency planning zone (IPZ), the area within an approximate 50-mile radius of the nuclear power plant. This sub-element focuses on those actions required for implementation of protective actions.

EXTENT OF PLAY

Applicable OROs should demonstrate the capability to secure and utilize current information on the locations of dairy farms, meat and poultry producers, fisheries, fruit growers, vegetable growers, grain producers, food processing plants, and water supply intake points to implement protective actions within the ingestion pathway EPZ.

ORO should use Federal resources as identified in the Federal Radiological Emergency Response Plan (FRERP), and other resources (e.g. compacts, nuclear insurers, 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:

This activity will be demonstrated at the State EOC on Oct. 24th. Ingestion Pathway Protective Action Decisions developed by the State Ingestion Pathway Coordinating Center (IPCC) and Federal Radiological Monitoring and Assessment Center (FRMAC) will be presented to the EOC representatives. The EOC will discuss and simulate initiation of the respective decisions. Contact with affected local jurisdictions will be demonstrated.

Locations Evaluated:

State EOC

Outstanding Issues:

None



EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

Sub-element 3.e – Implementation of Ingestion Pathway Decisions

Criterion 3.e.2 – Appropriate measures, strategies, and pre-printed instructional material are developed for implementing protective action decisions for contaminated water, food products, milk and agricultural production. (NUREG-0654, E.5, 7; J.9, 11)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to implement protective actions, based on criteria recommended by current Food and Drug Administration guidance, for the ingestion pathway emergency planning zone (IPZ), the area within an approximate 50-mile radius of the nuclear power plant. This sub-element focuses on those actions required for implementation of protective actions.

EXTENT OF PLAY

Development of measures and strategies for implementation of ingestion pathway zone (IPZ) protective actions should be demonstrated by formulation of protective action information for the general public and food producers and processors. This includes the capability for the rapid reproduction and distribution of appropriate reproduction-ready information and instructions to pre-determined individuals and businesses. OROs should demonstrate the capability to control, restrict or prevent distribution of contaminated food by commercial sectors. Exercise play should include demonstration of communications and coordination between organizations to implement protective actions. However, actual field play of implementation activities may be simulated. For example, communications and coordination with agencies responsible for enforcing food controls within the IPZ should be demonstrated, but actual communications with food producers and processors may be simulated.

State of Maryland Extent of Play:

This activity will be demonstrated at the State EOC on Oct. 24th. Ingestion Pathway Decisions developed by the State Ingestion Pathway Coordinating Center (IPCC) and Federal Radiological Monitoring and Assessment Center (FRMAC) will be presented to the EOC representatives. The EOC will discuss and simulate initiation of the respective decisions. Contact with affected local jurisdictions will be demonstrated. News release pertinent to the decisions will be developed at the EOC.

Locations Evaluated:

State EOC

Outstanding Issues:

None

EVALUATION AREA 3: PROTECTIVE ACTION IMPLEMENTATION

Sub-element 3.f – Implementation of Relocation, Re-entry, and Return Decisions

Criterion 3.f.1 – Decisions regarding controlled re-entry of emergency workers and relocation and return of the public are coordinated with appropriate organizations and implemented. (NUREG-0654, M.1, 3)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should demonstrate the capability to implement plans, procedures, and decisions for relocation, re-entry, and return. Implementation of these decisions is essential for the protection of the public from the direct long-term exposure to deposited radioactive materials from a severe accident at a commercial nuclear power plant.

EXTENT OF PLAY

Relocation: OROs should demonstrate the capability to coordinate and implement decisions concerning relocation of individuals, not previously evacuated, to an area where radiological contamination will not expose the general public to doses that exceed the relocation protective action guides (PAGs). OROs should also demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas that have residual radiation levels above the PAGs.

Areas of consideration should include the capability to communicate with OROs regarding timing of actions, notification of the population of the procedures for relocation, and the notification of, and advice for, evacuated individuals who will be converted to relocation status in situations where they will not be able to return to their homes due to high levels of contamination. OROs should also demonstrate the capability to communicate instructions to the public regarding relocation decisions.

Re-entry: OROs should demonstrate the capability to control re-entry and exit of individuals who need to temporarily re-enter the restricted area, to protect them from unnecessary radiation exposure and for exit of vehicles and other equipment to control the spread of contamination outside the restricted area. Monitoring and decontamination facilities will be established as appropriate.

Examples of control procedure subjects are: (1) the assignment of, or checking for, direct-reading and non-direct-reading dosimeters for emergency workers; (2) questions regarding the individuals' objectives and locations expected to be visited and associated timeframes; (3) maps and plots of radiation exposure rates; (4) advice on areas to avoid; and procedures for exit, including monitoring of individuals, vehicles, and equipment, decision criteria regarding contamination, proper disposition of emergency worker dosimeters, and maintenance of emergency worker radiation exposure records.

Return: OROs should demonstrate the capability to implement policies concerning return of members of the public to areas that were evacuated during the plume phase. OROs should demonstrate the capability to identify and prioritize services and facilities that require restoration within a few days, and to identify the procedures and resources for their restoration. Examples of these services and facilities are medical and social services, utilities, roads, schools, and intermediate term housing for relocated persons.

Communications among OROs for relocation, re-entry, and return may be simulated; however all simulated or actual contacts should be documented. These discussions may be accomplished in a group setting.

OROs should use Federal resources as identified in the Federal Radiological Emergency Response Plan (FRERP), and other resources (e.g. compacts, nuclear insurers, 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:

This activity will be demonstrated at the State EOC on Oct. 24th. Relocation, Re-entry and Return Decisions developed by the State Ingestion Pathway Coordinating Center (IPCC) and Federal Radiological Monitoring and Assessment Center (FRMAC) will be presented to the EOC representatives. The EOC will discuss and simulate initiation of the respective decisions. Contact with affected local jurisdictions will be demonstrated.

Locations Evaluated:

State EOC

Outstanding Issues:

None

EVALUATION AREA 4: FIELD MEASUREMENT AND ANALYSIS

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

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.

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.

Locations Evaluated:

Calvert County Field Monitoring Team
St. Mary's County Field Monitoring Team
Dorchester County Field Monitoring Team

Outstanding Issues:

None

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.

ORO 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. State and local teams will not measure plume centerline. At least six readings will be obtained at a minimum of one survey point location. 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.

Locations Evaluated:

Calvert County EOC
Dorchester County EOC

Outstanding Issues:

None

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/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.

ORO 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. Only the State teams will demonstrate this objective. One sample will be obtained in an area that exhibits above background ambient. Delivery of samples for additional analysis will not be demonstrated. Chain of custody procedures will be described to the evaluator.

Locations Evaluated:

Calvert County Field Monitoring Team
St. Mary's County Field Monitoring Team
Dorchester County Field Monitoring Team

Outstanding Issues:

None

EVALUATION AREA 4: FIELD MEASUREMENT AND ANALYSIS

Sub-element 4.b – Post Plume Phase Field Measurements and Sampling

Criterion 4.b.1 – The Field teams demonstrate the capability to make appropriate measurements and to collect appropriate samples (e.g., food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making. (NUREG-0654, I.8; J.11)

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to assess the actual or potential magnitude and locations of radiological hazards in the ingestion emergency planning zone (IPZ) and for relocation, re-entry and return measures.

This sub-element focuses on the collection of environmental samples for laboratory analyses that are essential for decisions on protection of the public from contaminated food and water and direct radiation from deposited materials.

EXTENT OF PLAY

The ORO field teams should demonstrate the capability to take measurements and samples, at such times and locations as directed, to enable an adequate assessment of the ingestion pathway and to support re-entry, relocation, and return decisions. When resources are available, the use of aerial surveys and in-situ gamma measurement is appropriate. All 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's plan and/or procedures.

Ingestion pathway samples should be secured from agricultural products and water. Samples in support of relocation and return should be secured from soil, vegetation, and other surfaces in areas that received radioactive ground deposition.

OROs should use Federal resources as identified in the Federal Radiological Emergency Response Plan (FRERP), and other resources (e.g. compacts, nuclear insurers, 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:

Note evaluated for this exercise.

EVALUATION AREA 4: FIELD MEASUREMENT AND ANALYSIS

Sub-element 4.c – Laboratory Operations

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to perform laboratory analyses of radioactivity in air, liquid, and environmental samples to support protective action decision-making.

EXTENT OF PLAY

The laboratory staff should demonstrate the capability to follow appropriate procedures for receiving samples, including logging of information, preventing contamination of the laboratory, preventing buildup of background radiation due to stored samples, preventing cross contamination of samples, preserving samples that may spoil (e.g., milk), and keeping track of sample identity. In addition, the laboratory staff should demonstrate the capability to prepare samples for conducting measurements.

The laboratory should be appropriately equipped to provide analyses of media, as requested, on a timely basis, of sufficient quality and sensitivity to support assessments and decisions as anticipated by the ORO's plans and procedures. The laboratory instrument calibrations should be traceable to standards provided by the National Institute of Standards and Technology. Laboratory methods used to analyze typical radionuclides released in a reactor incident should be as described in the plans and procedures. New or revised methods may be used to analyze atypical radionuclide releases (e.g. transuranics or as a result of a terrorist event) or if warranted by circumstances of the event. Analysis may require resources beyond those of the ORO.

The laboratory staff is qualified in radioanalytical techniques and contamination control procedures.

OROs should use Federal resources as identified in the Federal Radiological Emergency Response Plan (FRERP), and other resources (e.g. compacts, nuclear insurers, 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:

Not evaluated for this exercise.

EVALUATION AREA 5: EMERGENCY NOTIFICATION & PUBLIC INFORMATION

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

Criterion 5.a.1 – Activities associated with primary route 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 emergency planning zone (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.

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. Actual siren sounding and emergency alert system (EAS) demonstration will be simulated.

Locations Evaluated:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

Outstanding Issues:

None

EVALUATION AREA 5: EMERGENCY NOTIFICATION & 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 with 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

ORO's 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. One back-up route alerting route will be demonstrated in each risk county.

Locations Evaluated:

Calvert County EOC, Route Alerting Team
St. Mary's County Route Alerting Team
Dorchester County EOC, Route Alerting Team

Outstanding Issues:

None

EVALUATION AREA 5: EMERGENCY NOTIFICATION & 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 emergency planning zones (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 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.

Locations Evaluated:

Calvert County EOC
St. Mary's County EOC
Dorchester County EOC

Outstanding Issues:

None

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 met. 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:

These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. **This element will be evaluated as an out-of-sequence activity.**

Locations Evaluated:

Calvert County Reception Center, Emergency Worker Decon. Station
St. Mary's County Reception Center, Emergency Worker Decon. Station
Dorchester County Reception Center, Emergency Worker Decon. Station

Outstanding Issues:

None

EVALUATION AREA 6: SUPPORT OPERATION/FACILITIES

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:

These activities will be based on the ORO's plans and procedures and completed, as they would be in an actual emergency. **This element will be evaluated as an out-of-sequence activity.**

Locations Evaluated:

Calvert County Emergency Worker Decon. Station
St. Mary's County Emergency Worker Decon. Station
Dorchester County Emergency Worker Decon. Station

Outstanding Issues:

None

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 the American Red Cross planning guidelines. 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, J.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 (ARC) 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 criteria, 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.

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.

This element will be evaluated as an out-of-sequence activity. Actual set up of the center will not be demonstrated. Processes will be described to the evaluator during an interview at the designated location.

Locations Evaluated:

Calvert County Congregate Care Center
St. Mary's County Congregate Care Center
Dorchester County Congregate Care Center

Outstanding Issues:

Calvert County—11-02-19-P-01 The Calvert County Plan does not include Plum Point Middle or Windy Hill Elementary School.

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APPENDIX 4 EXERCISE SCENARIO

CONSTELLATION ENERGY GROUP

CALVERT CLIFFS NUCLEAR POWER PLANT OCTOBER 24, 2003 EMERGENCY EXERCISE

SP-3A GENERAL DESCRIPTION

The scenario begins with Unit 1 at 100% power, Unit 1 has been at full power for 210 days. Unit 2 is in mode 6, day 20 of a 35 day refueling outage. 13 High Pressure Safety Injection (HPSI) pump and 13 Charging pump are tagged out of service for breaker maintenance and scheme checks by the Electrical Shop and Engineering. A wiring error was discovered during 23 Auxiliary Feedwater pump breaker maintenance from a recent modification that prevents breaker operation. 23 Auxiliary Feedwater pump is tagged out of service for breaker repairs. The breaker wiring error will cause failure of all breakers to close on 11 and 12 HPSI pumps, 11 and 12 Containment Spray pumps, 11 and 14 Containment Air Coolers and 11 and 12 Low Pressure Safety Injection (LPSI) pumps. Also the Safety Injection Tank relief valves will fail and depressurize the tanks.

The Department of Homeland Security has upgraded the national threat level to Orange. The NRC has notified all East Coast U.S. Nuclear Power Plant licensees that a general threat exists due to a missing commercial aircraft. The Department of Defense has notified all East Coast licensees of routine precautionary air patrols. Patuxent River Naval Air Station is providing the patrol for Calvert Cliffs.

At scenario time 00:00, Patuxent River Naval Air Station (NAS) will call the Calvert Control Center and Calvert Cliffs Security. The NAS reports that an F-18 on patrol has gone off RADAR. The NAS reports the fighter jet might have crashed on Calvert Cliffs property as a result of engine trouble.

At scenario time 00:05, a Security patrol will observe the jet crashing into the ISFSI Protected Area doing severe damage to the ISFSI Protected Area fence and ISFSI surveillance equipment. The downed jet catches on fire in the ISFSI Protected Area. The pilot has bailed out and no one is hurt. Damage to Horizontal Storage Modules is consistent with the EPRI Aircraft Crash Study.

At scenario 00:12, the Shift Manager will declare an Unusual Event for an aircraft crash into the ISFSI Protected Area and will call for fire fighting assistance from Calvert Control Center.

At scenario time 00:15, Patuxent River Naval Air Station will call Calvert Control Center and CCNPPI Security to report the crash. The NAS will call Calvert Cliffs Security for

access to the site. Maryland Emergency Management Agency and Maryland Department of the Environment will call Calvert Cliffs Security for access to the site.

Security will establish a guard at the ISFI. Engineering and Maintenance will develop a clean up and repair plan for the ISFSI Protected Area. Coordination between CCNPPI, DOD, MEMA and MDE will be required in response to the crash and the ISFSI damage. Coordination between CCNPPI and Calvert County volunteer fire fighters will be required.

At Scenario time 00:33, an acetylene welding rig will catch fire and explode in the Unit 1, 45-foot elevation, East Electrical Penetration Room. The explosion will destroy the wiring of 11 and 13 Containment Air Cooler starters. The fire brigade will be called out for the explosion. The Control Room will send a plant operator to investigate the electrical penetrations and the Containment Air Cooler starters and will review AOP-9P, Safe Shutdown due to severe fire in Room 429 and will secure the ventilation.

Promptly, after scenario time 00:33, the Shift Manager will declare an Alert for an explosion in the Electrical Penetration Room and assemble the Emergency Response Organization.

By scenario time 01:00, the Emergency Response Organization staffing will be completed and the Site Emergency Coordinator will relieve the Control Room and Technical Support Center of interim Emergency Response Plan Implementation Procedure (ERPIP) duties. The Operational Support Center will assemble and dispatch repair teams to organize the clean up and repair of the ISFSI protected area and the Electrical Penetration room.

At scenario time 01:17, the NRC will notify Security of a site specific credible insider threat. The Site Emergency Coordinator will implement the two-person line of sight rule. CCNPPI will notify Calvert Control Center and will begin investigation of the threat.

At scenario time 02:00, a Loss of Coolant Accident (LOCA) will occur on Unit 1. The Pressurizer will empty and pressurizer pressure will decrease. The reactor and main turbine will be manually or automatically tripped and the Control Room will implement EOP-0, Reactor Trip immediate Actions. A Safety Injection Actuation Signal (SLAS) will be generated on low reactor coolant system (RCS) pressure, 11 and 12 HPSI pumps will not run due to the failure of the 4 Kv breakers. There will be concurrent mechanical damage to the 12 HPSI pump shaft. 12 Charging pump will not produce flow due to a coupling failure. The common mode failure, the wiring error which prevents breaker operation of the 13 HPSI pump, and the 23 Auxiliary Feedwater pump, will cause the 12 and 14 Containment Air Cooler, and 11 and 12 Containment Spray pumps to fail to run when they receive start signals.

At scenario time 02:15, the Site Emergency Coordinator will declare a Site Emergency for potential loss of two fission product barriers. EOP-0 safety function, RCS pressure and inventory control, will not be met due to pressurizer level, pressurizer pressure, and

subcooling. Containment environment will not be met due to containment pressure and temperature. The Control Room will implement EOP-8, Functional Recovery Procedure after EOP-5, LOCA (Loss of Coolant Accident), due to no available HPSI pumps or directly implement EOP-8, functional Recovery Procedure.

By scenario time 02:20, two intermediate safety functions will not met in EOP-5 and the Control Room will implement EOP-8, Functional Recovery Procedure.

By scenario time 02:30, Core and RCS heat removal acceptance criteria will not be met in EOP-8. At this time the Containment Equipment Hatch and Personnel Air Lock seals degrade due to high containment temperature creating a leak path directly to the environment. Steam is visible inside the Unit-1 Butler Building. High airborne radioactivity can be measured inside the Unit-1 Butler Building.

A combination of RCS leakage and failure of high-pressure safety injection will take the plant into a severe accident sequence.

By scenario time 03:00, the Technical Support center will implement the Severe Accident Management ERPIPs when the core exit thermocouples reach 1200 degrees.

By scenario time 03:20, when the core exit thermocouples have reached 1300 degrees, the Site Emergency Coordinator will declare a General Emergency for fission barrier degradation based on the loss of two barriers and a potential loss of a third barrier. The Site Emergency Coordinator will recommend evacuation of Protective Action Zone (PAZ) 1.

After scenario time 03:30, the Onsite Monitoring Team confirms high airborne activity down wind of the plant East Road.

After scenario time 04:15, the Onsite Monitoring Team and Offsite Monitoring Team Confirms loss of Containment integrity based on field samples. The Dose Assessment Office may recommend evacuation of PAZ 8.

By scenario time 04:30, the Operational Support Center will complete repair of the Containment Spray pumps and Containment Air Coolers.

By 05:00, Operations will initiate Containment Spray and Containment Air cooling in accordance with recommendations based on Severe Accident Management ERPIPs.

At scenario time 05:15, a vessel melt through will occur without a hydrogen burn and the Containment will heat momentarily to 1149 degrees at the time of a pressure spike to 107 pounds.

By scenario time 05:30, a success path to establish Containment spray and cooling will be established. Data will indicate a reduction in the radioactivity release rate. The

Containment can be cooled to ambient temperature and pressure and the release will be brought under control.

The radioactivity in this scenario will be transported down wind using controlled meteorological data. The two-mile dose will exceed EPA protective action guides as calculated with the RADDPOSE dose modeling software for thyroid. Radiation levels will be elevated out to and beyond 10 miles, but will not reach EPA protective action guides at 10 miles as calculated with the RADDPOSE dose modeling software.

CCNPPI will recommend protective actions of the public. The State and Counties will implement protective actions to reduce the exposure of the public to the accidental release of radioactive materials.

CCNPPI will determine the magnitude of the release and estimate the location of the offsite impact. CCNPPI will monitor the release with the Containment High Range Radiation Monitor and the Wide Range Noble Gas Monitor and dispatch field-monitoring teams to obtain downwind samples to define the plume.

The State and Counties will perform an independent assessment of the consequences of the accidental release of radioactive materials.

Onsite, the exercise will terminate on or before scenario time 06:00. Offsite, State and County participants will continue specific activities as needed until offsite objectives are met.

APPENDIX 5 PLANNING ISSUES

This appendix contains the Planning Issues assessed during the April 13, 2004, exercise at Calvert Cliffs Nuclear Power Plant (CCNPP). Planning Issues are issues identified in an exercise or drill that do not involve participant performance, but rather involve inadequacies in the plan or procedures. Planning Issues are required to be corrected through the revision and update of the appropriate State and local Radiological Emergency Response Plans (RERPs) and/or procedures in accordance with the following schedule:

- Within 120 days of the date of the exercise/drill: when the Planning Issue is directly related to protection of the public health and safety.
- During the annual plan review and update (reported in the Annual Letter of Certification): when the Planning Issue does not directly affect the public health and safety. However, when the date for the annual plan review and update is imminent and the responsible organization does not have sufficient time to make the necessary revisions in the plans and/or procedures, the revised portion of the plans and/or procedures should be submitted in the subsequent annual plan review and update and reported in the Annual Letter of Certification.

Any requirement for additional training of responders to radiological emergencies necessitated by the revision and update of the plans and/or procedures must be completed within the timeframes described above in order for the Planning Issue to be considered resolved.

Calvert County School District (Patuxent H.S.)

Issue No.: 11-04-3.c.2-P-01

Condition: The bus driver was not briefed, or issued potassium iodide (KI) or dosimetry in accordance with the Calvert County Public Schools – Bus Routes Standard Operating Procedures (SOPs).

Possible Cause: The Calvert County Transportation Department was not familiar with the requirement listed in the Bus Routes SOP.

Reference:

- NUREG-0654, J.10.c, d, g
- Calvert County Radiological Emergency Plan and Standard Operating Procedure Attachment #9; Board of Education Standard Operating Procedure; 5.0 Protective Actions
- Calvert County School Services; Tabs A and E
- Calvert County School Plan – Revision 1 ; Response Action – School Bus Driver

Effect: Bus drivers required to enter the 10-mile Emergency Planning Zone to evacuate children to the relocation site may not have the tools to determine their radiological exposure. Therefore, the bus drivers' exposure could go unrecorded.

Recommendation: Review and make changes, as necessary, to the basic County Plan and County Public School Plan to delineate the role of the school bus drivers.

Issue No.: 11-04-3.c.2-P-02

Condition: Patuxent High School students who are attending the Calvert Center Technical School are not accounted for during a radiological incident.

Possible Cause: There are no specific instructions for implementing protective actions for the students who attend the Career Center Technical School.

Reference: NUREG-0654, J.10.c, d, g

Effect: The health and safety of the Patuxent High School students who are attending classes at the Career Center Technical School could be compromised during a radiological emergency.

Recommendation: Develop a plan/procedure to address students with a split roster.

Issue No.: 11-04-3.c.2-P-03

Condition: There may not be adequate space at the Northern High School to accommodate school children evacuees and congregate care general population evacuees.

Possible Cause: Northern High School, with a congregate care capacity of 900 persons, has been designated to serve both as school reception center (host school) and congregate care center for general population. However, school children and general population assigned to this facility far exceeds its capacity (900 persons). Populations assigned are listed below:

Patuxent High School	1,800 students and staff
Southern Middle School	1,000 students and staff
St. Leonard Elementary School	700 students and staff

Total School Population	3,500 students and staff

Reference:

- NUREG-0654, J.10.c, d, g
- Calvert County Radiological Emergency Plan & Standard Operating Procedures
- The Calvert County Public Schools Plan
- The Patuxent High School Crisis Plan, November 2001 Risk/Host School for CCNPP Incidents.

Effect: There is a potential for congestion and overcrowding at Northern High School.

Recommendation: Verify the capacity for Northern High School (host school) to function properly as both a Host and Mass Care Facility and adjust all plans, accordingly.

St. Mary's County School District (Esperanza M.S.)

Issue No.: 11-04-3.c.2-P-04

Condition: The bus driver was not briefed, or issued potassium iodide (KI) or dosimetry in accordance with the St. Mary's Public Schools – Bus Routes Standard Operating Procedures (SOPs).

Possible Cause: The St. Mary's County Transportation Department was not familiar with the requirement listed in the Bus Routes SOP.

Reference:

- NUREG-0654, J.10.c, d, g
- St. Mary's County Plan, Tab D, Exhibit 1, Bus Drivers Action Checklist, February 2004

Effect: Bus drivers required to enter the 10-mile Emergency Planning Zone to evacuate children to the relocation site may not have the tools to determine their radiological exposure. Therefore, the bus drivers' exposure could go unrecorded.

Recommendation: Review and make changes, as necessary, to the basic County Plan and the County Public School Plan to delineate the role of the school bus drivers.