



FINAL EXERCISE REPORT

CALVERT CLIFFS NUCLEAR POWER PLANT

Licensee: Constellation Energy Group

Exercise Dates: September 11, 2001
August 21–22, 2002
September 9, 2002

Report Date: January 3, 2003

**FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION III
615 Chestnut Street
Philadelphia, Pennsylvania 19106**

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I. EXECUTIVE SUMMARY

On September 9, 2002, an exercise was conducted in the 10-mile plume exposure pathway emergency planning zone (EPZ) around the Calvert Cliffs Nuclear Power Plant by the Federal Emergency Management Agency (FEMA), Region III. The purpose of the exercise was to assess the level of State and local preparedness in responding to a radiological emergency. Out-of-sequence demonstrations of school protective action implementation were conducted on September 11, 2001, and Traffic and Access Control Points (TCPs/ACPs), as well as Reception Center—Monitoring, Decontamination, and Registration, Congregate Care, and Emergency Worker, Equipment and Vehicle—Monitoring and Decontamination activities, were conducted on August 21-22, 2002. 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 October 21, 1999, and October 26, 1999. The qualifying emergency preparedness exercise was conducted on September 19, 1985.

FEMA wishes to acknowledge the efforts of the many individuals in the State of Maryland, and the counties of Calvert, St. Mary's, Dorchester, and Anne Arundel.

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

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

- *Traffic and Access Control*: Conducted on August 21-22, 2002, in Calvert, St. Mary's, and Dorchester counties.
- *Reception Center – Monitoring, Decontamination, and Registration*: Conducted on August 21-22, 2002, in Calvert, St. Mary's, and Dorchester counties.
- *Congregate Care*: Conducted on August 21-22, 2002, in Calvert, St. Mary's, and Dorchester counties.
- *Emergency Workers, Equipment, and Vehicles – Monitoring and Decontamination*: Conducted on August 21-22, 2002, in Calvert, St. Mary's, and Dorchester counties.
- *School Interviews*: Conducted on September 11, 2001, in Calvert and St. Mary's County.

This report also includes the final evaluation of activities of the State Field Monitoring Team that were demonstrated and evaluated during the Peach Bottom Radiological Emergency Preparedness Exercise conducted on August 15, 2000.

The State and local organizations except where noted in this report demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. One Deficiency, one Area Requiring Corrective Action (ARCA), and one planning issue were identified as a result of this exercise. The Deficiency was successfully re-demonstrated during exercise activities on September 9, 2002. In addition, two prior ARCAs were not scheduled to be demonstrated.

II. INTRODUCTION

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

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

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

- Taking the lead in offsite emergency planning and in the review and evaluation of RERPs and procedures developed by State and local governments;
- Determining whether such plans and procedures can be implemented on the basis of observation and evaluation of exercises of the plans and procedures conducted by State and local governments;
- Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (44 CFR Part 354, Appendix A, September 14, 1993); and
- Coordinating the activities of the following Federal agencies with responsibilities in the radiological emergency planning process:
 - U.S. Department of Commerce,
 - U.S. Nuclear Regulatory Commission,
 - U.S. Environmental Protection Agency,
 - U.S. Department of Energy,
 - U.S. Department of Health and Human Services,
 - U.S. Department of Transportation,
 - U.S. Department of Agriculture,
 - U.S. Department of the Interior, and
 - U.S. Food and Drug Administration.

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 to FEMA Region III on August 8, 1985 and received FEMA approval, under 44 CFR 350, on the same date.

The most recent full-scale exercise at this site was conducted on October 21, 1999, and October 26, 1999. The qualifying emergency preparedness exercise was conducted on September 19, 1985.

A REP exercise was conducted on September 9, 2002, 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 Calvert Cliffs Nuclear Power Plant. The purpose of this exercise report is to present the exercise results and findings on the performance of the offsite response organizations (ORO) during a simulated radiological emergency.

The findings presented 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.

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

- NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980;
- FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991; and
- FEMA-REP-15, "Radiological Emergency Preparedness Exercise Evaluation Methodology," September 1991.

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

Section IV of this report, entitled "Exercise Evaluation and Results," presents detailed information on the demonstration of applicable exercise objectives at each jurisdiction or functional entity evaluated in a jurisdiction-based, issues-only format. This section also contains: (1) descriptions of all Deficiencies and ARCAs assessed during this exercise, recommended corrective actions, and the State and local governments' schedule of corrective actions for each identified exercise issue, and (2) descriptions of unresolved ARCAs assessed during previous exercises and the status of the OROs' efforts to resolve them.

III. EXERCISE OVERVIEW

Contained in this section are data and basic information relevant to the September 9, 2002, exercise to test the offsite emergency response capabilities in the area surrounding the Calvert Cliffs Nuclear Power Plant. This section of the exercise report includes a description of the plume 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 Emergency Planning Zone Description

The Calvert Cliffs Nuclear Power Plant (CCNPP) is located near Maryland Highway 2-4 in Calvert County, Maryland, on the west bank of the Chesapeake Bay near Lusby, Maryland. The 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 Calvert Cliffs Nuclear Power Plant exercise on September 9, 2002, and related out-of-sequence demonstrations.

FEDERAL AGENCIES

United States Coast Guard
United States Department of Agriculture
United States Navy, Patuxent River Naval Air Station
US Army Corps of Engineers

STATE OF MARYLAND

Maryland Attorney General's Office
Maryland Department of Agriculture
Maryland Department of Budget and Management
Maryland Department of Business and Economic Development
Maryland Department of the Environment
Maryland Department of Health and Mental Hygiene
Maryland Department of Housing and Community Development
Maryland Department of Natural Resources
Maryland Department of Planning
Maryland Department of Public Safety and Correctional Services
Maryland Department of State
Maryland Department of Transportation
Maryland Emergency Management Agency
Maryland Emergency Management Agency, Technical Advisory Group
Maryland Institute for Emergency Medical Services System
Maryland Military Department/National Guard
Maryland National Guard
Maryland Natural Resources Police
Maryland Office of Aging
Maryland State Department of Education
Maryland State Highway Administration
Maryland State Police
Maryland State Police – Post T
Maryland State Police – Post U
Maryland Wing Civil Air Patrol
State Fire Marshall

RISK JURISDICTIONS

CALVERT COUNTY

Calvert County Board of County Commissioners
Calvert County Board of Education
Calvert County Department of Environmental Health
Calvert County Department of General Services
Calvert County Department of Health
Calvert County Department of Natural Resources
Calvert County Department of Public Safety
Calvert County Department of Public Works, Calvert County Roads
Calvert County Department of Social Services
Calvert County Division of Emergency Management
Calvert County Farm Services Agency
Calvert County Fire-Rescue
Calvert County Highway Association
Calvert County Natural Resources Police
Calvert County Public Facilities
Calvert County Public Schools
Calvert County School District
Calvert County Sheriff's Department
Calvert County Sheriff's Police
Calvert County Transportation Department

DORCHESTER COUNTY

Dorchester County Board of County Commissioners
Dorchester County Board of Education
Dorchester County Department of Natural Resources Police
Dorchester County Department of Social Services
Dorchester County Emergency Management Agency
Dorchester County Emergency Management and Civil Defense Agency
Dorchester County Fire and Rescue
Dorchester County Health Department
Dorchester County Highway Department
Dorchester County School System
Dorchester County Sheriff's Office

ST. MARY'S COUNTY

St. Mary's County Board of County Commissioners
St. Mary's County Board of Education
St. Mary's County Department of Public Works
St. Mary's County Department of Recreation and Parks

St. Mary's County Department of Social Services
St. Mary's County Emergency Management Agency/REACT
St. Mary's County Environmental Health Department
St. Mary's County Fire Department
St. Mary's County Health Department
St. Mary's County Human Resources
St. Mary's County Rescue Squad
St. Mary's County Sheriff's Office

SUPPORT JURISDICTIONS

ANNE ARUNDEL COUNTY

Anne Arundel Emergency Management Bureau

PRIVATE/VOLUNTEER ORGANIZATIONS

American Red Cross
American Red Cross, Calvert County Chapter
Radio Amateur Civil Emergency Services (RACES)
Maryland Energy Administration
Maryland Insurance

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 September 9, 2002. Also included are times that notifications were made to the participating jurisdictions/functional entities.

TABLE 1. EXERCISE TIMELINE

DATE AND SITE: September 9, 2002 – Calvert Cliffs Nuclear Power Plant

Emergency Classification Level or Event	Time Utility Declared	Time That Notification Was Received or Action Was Taken							
		Maryland State EOC	Accident Assessment Dundalk	Accident Assessment EOF	Joint Information Center	Calvert County EOC	St. Mary's County EOC	Dorchester County EOC	
Unusual Event	0820	0825	N/A	0815	N/A	0832	0835	0833	
Alert	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Site Area Emergency	0845	0854	N/A	0845	0925	0848	0854	0852	
General Emergency	1033	1040	N/A	1033	1044	1038	1056	1041	
Simulated Radiation Release Started	1020	1040	N/A	1020	N/A	1037	1056	1041	
Simulated Radiation Release Terminated	1300	1300	N/A	1252	N/A	1252	1312	1312	
Facility Declared Operational		1030	N/A	0945	0957	0919	0934	0930	
Governor's Declaration of State of Emergency		1115	N/A	1115	1125	1115	1306	N/A	
County Declaration of State of Emergency		N/A	N/A	N/A	N/A	0905	0910	N/A	
Exercise Terminated		1406	N/A	1410	1400	1403	1409	1400	
1st A&N Decision: General Public Notification		1024	N/A	1024	1024	1024	1035	1021	
1st Siren Activation		1031	N/A	1031	1031	1031	N/A	1031	
1st EAS or EBS Message		1034	N/A	1034	1034	1034	N/A	1034	
2nd A&N Decision: Shelter - Zones 2, 4 5, 6, and 7 Evacuate - Zones 1, 3, and 8		1059	N/A	1059	1059	1059	1059	1059	
2nd Siren Activation									
2nd EAS or EBS Message		1109	N/A	1109	1109	1109	1109	1109	
KI Administration - Decision to take KI		1130	N/A	1128	1145	1109**	1021**	1112**	
KI Administration - Decision not to take KI		N/A	N/A	N/A	N/A	N/A	N/A	N/A	

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IV. EXERCISE EVALUATION AND RESULTS

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities, which participated in the September 9, 2002, exercise to test the offsite emergency response capabilities of State and local governments in the 10-mile EPZ surrounding the Calvert Cliffs Nuclear Power Plant.

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

A. Summary Results of Exercise Evaluation

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

M – Met (No Deficiency or ARCAs assessed and no unresolved ARCAs from prior exercises)

D – Deficiency assessed

A – ARCA(s) assessed or unresolved ARCA(s) from prior exercise(s)

N – Not Demonstrated (Reason explained in Subsection B)

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TABLE 2. SUMMARY OF RESULTS OF EXERCISE EVALUATION

DATE AND SITE: September 11, 2001, August 21 and 22, 2002, and September 9, 2002 – Calvert Cliffs Nuclear Power Plant

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B. Status of Jurisdictions Evaluated

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

- **Met** – Listing of the demonstrated exercise objectives 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 objectives 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 Actions** – Listing of the demonstrated exercise objectives under which one or more ARCAs were assessed during the current exercise or ARCAs assessed during prior exercises remain unresolved. Included is a description of the ARCAs assessed during this exercise and the recommended corrective action to be demonstrated before or during the next biennial exercise.
- **Not Demonstrated** – Listing of the exercise objectives which were not demonstrated as scheduled during this exercise and the reason they were not demonstrated.
- **Prior ARCAs – Resolved** – Descriptions of ARCAs assessed during previous exercises that were resolved in this exercise and the corrective actions demonstrated.
- **Prior ARCAs – Unresolved** – Descriptions of ARCAs assessed during prior exercises, which were not resolved in this exercise. Included is the reason the ARCA remains unresolved and recommended corrective actions to be demonstrated before or during the next biennial exercise.

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

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

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

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

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

- **Plant Site Identifier** – A two-digit number corresponding to the Utility Billable Plant Site Codes.
- **Exercise Year** – The last two digits of the year the exercise was conducted.
- **Objective Number** – A two-digit number corresponding to the objective numbers in FEMA-REP-14.
- **Issue Classification Identifier** – (D = Deficiency, A = ARCA). Only Deficiencies and ARCAs are included in exercise reports.
- **Exercise Issue Identification Number** – A separate two (or three) digit indexing number assigned to each issue identified in the exercise.

1. STATE OF MARYLAND

1.1 State Emergency Operations Center

- a. **MET:** Objectives 1, 2, 3, 4, 9, 10, 12, 13, 14, and 23
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAS – RESOLVED:**

Issue No.: 11-99-12-A-01

Description: Two of the press releases developed and disseminated by the Maryland State Emergency Operations Center (EOC) Public Information Officers (PIO) contained errors. Press Release #5 concerned the protective action decision (PAD) to evacuate Zones 1, 2, 3, 4, and 6 and to shelter-in-place in Zones 5, 7, and 8. Zone 8 is a part of Dorchester County that was ordered to shelter-in-place. However, at the bottom of page 3 of the press release, it indicates that “Evacuees from Dorchester County should report to the Reception Center...at: Maple Elementary School....” This error probably occurred because a pre-scripted release was used and the above-cited section should have been deleted before it was printed, approved, and released. Press Release #9, *Additional Precautionary Measures Recommended for Farmers*, did not accurately reflect the PAD, which was for livestock within the 50-mile EPZ (Zones J, K, L, M, N, P, Q, and R) to be sheltered and placed on stored feed and water. However, the press release did not indicate this, but instead discussed radiation and decontamination measures. (NUREG-0654, E.7 and G.4.a)

Corrective Action Demonstrated: Five press releases were developed and disseminated by the Maryland State EOC PIO. All five press releases contained accurate information, were clear, and used understandable language. The contents of the messages were consistent with the PADs made by the decision makers. They all contained up-to-date information.

Issue No.: 11-97-13-A-21

Description: The extent-of-play agreement requires rumor control to receive approximately 12 calls per hour; however, only three or four calls per hour were received. Two individuals should staff the rumor control function per

the extent-of-play agreement. In addition, the rumor control phone was not answered several times during the exercise. (NUREG-0654, N.1.a)

Corrective Action Demonstrated: Twelve telephone calls per hour were received by the State Rumor Control Staff. A minimum of two staff personnel were taking calls throughout the exercise period (Site Area Emergency and General Emergency), and all calls were answered.

Issue No.: 11-97-13-A-31

Description: The Rumor Control function was not fully demonstrated in accordance with the extent-of-play agreement. The average number of calls handled per hour was 4.29 calls per person (15 calls in 105 minutes). The extent-of-play agreement stated that a minimum of six calls per hour per person would be received. (NUREG-0654, G.4.b, c)

Corrective Action Demonstrated: In accordance with the extent-of-play agreement, the required number of calls was received by the Rumor Control staff. The two staff members demonstrated 12 calls per hour.

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.2 News Media Center

a. **MET:** Objective 1, 2, 4, and 12

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:** NONE

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.3 Field Monitoring Team A

a. **MET:** Objectives 4, 5, 6, 8, and 14

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAS – RESOLVED:**

Issue No.: 11-99-08-A-04 (at Peach Bottom 2000)

Description: The air sampling pump was not checked by Field Monitoring Team (FMT)-A for proper operation prior to deployment in accordance with Section III.B.4.a of their procedures. (NUREG-0654, H.10)

Corrective Action Demonstrated: The air sampling pump was checked by FMT-A prior to deployment to the field.

f. **PRIOR ARCAs – UNRESOLVED:** NONE

1.4 **Field Monitoring Team B**

a. **MET:** Objectives 4, 5, 6, 8, and 14

b. **DEFICIENCY:** NONE

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

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-06-A-05

Description: The Field Monitoring Team (FMT)-B did not keep the detector probes enclosed in plastic as a protective measure as required by FEMA-REP-14. (NUREG-0654, I.7)

Corrective Action Demonstrated: Thin plastic bags were wrapped around probes and instruments during measurements.

Issue No.: 11-99-08-A-06 (at Peach Bottom 2002)

Description: FMT-B did not check the MS-2/SPA-3 counting system or air pump prior to deployment. A source check was not performed in accordance with the procedures (Emergency Procedure 302, Revision 6, Section B and Attachment 8). In addition, the FMT did not follow their procedures (EP-302, revision 6, section E) for collecting an air sample. The team collected a two-minute air sample, drawing only four cubic feet of air through the sample media. In addition, reproducible geometry was not used when radioiodine and particulate measurements were made. (NUREG-0654, H.10 and I.9)

Corrective Action Demonstrated: FMT-B checked the MS-2/SPA-3 counting system and air pump prior to deployment and completed a source check of the instrument. When asked to take an air sample, the team collected a 2.8-minute air sample drawing 10 cubic feet. Reproducible geometry was used when radioiodine and particulate measurements were made.

f. **PRIOR ARCAs – UNRESOLVED:** NONE

2. RISK JURISDICTIONS

2.1 Calvert County

2.1.1 County Emergency Operations Center

a. **MET:** Objectives 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 15, 16, and 19

b. **DEFICIENCY:** NONE

c. **AREAS REQUIRING CORRECTIVE ACTION:** Objective 14

Issue No.: 11-02-14-A-01

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)

Recommendation: The Radiological Officer (RO) should perform all the actions listed in the General Emergency checklist for the RO position. Field teams should be notified according to their procedures.

Schedule of Corrective Actions: Training will be conducted to ensure the RO completes all actions on his checklist.

d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-03-A-07

Description: The Sheriff's representative failed to inform the route alerting team in the field that a release from the plant was taking place. This caused the route alerting team to inform the residents of information that was not

current. The route alerting team had been advising the residents that a release was possible. (NUREG-0654, A.2.a and J.10.c)

Corrective Action Demonstrated: The Calvert County Sheriff's Action Log indicates that he was informed of the airborne radioactivity release. The Sheriff's Emergency Operations Center checklist directs the Sheriff to relay any radiological information to all field personnel. This item was initialed as being completed by the Sheriff's representative at 1035.

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

2.1.2 Field Monitoring Team

- a. **MET:** Objectives 4, 5, 6, and 14
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.3 Reception Center/Mass Care (Anne Arundel – Southern High School)

- a. **MET:** Objectives 5, 18, and 19
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.4 Emergency Worker Decontamination Station (Calvert County Landfill)

- a. **MET:** Objectives 5 and 22
- b. **DEFICIENCY:** NONE

- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-22-A-08

Description: The personnel monitor at the Calvert County Emergency Worker Decontamination Station did not follow his procedure in performing thyroid screenings in accordance with the Calvert County Radiological Emergency Plan and Standard Operating Procedures, Attachment 4-2, Section 3.2. The beta shield window was open when thyroid screenings were demonstrated. (NUREG-0634, K.5.b)

Corrective Action Demonstrated: Personnel monitors conducted thyroid screenings correctly with beta shield CLOSED as per Calvert County procedure.

Issue No.: 11-99-22-A-09

Description: After decontamination, according to County procedure, a person would be re-monitored, out-of-doors, while wearing a Tyvek suit. Such a procedure has the following faults. Re-monitoring on the stairs out-of-doors, while wearing a Tyvek suit, could lead to discomfort in inclement weather. In addition, using this procedure could underestimate the extent of beta contamination, which would be attenuated by the Tyvek suit, and could lead to contamination of the passageway if a person needs to be re-decontaminated.

Corrective Action Demonstrated: A new facility was used to monitor emergency workers indoors. The decontamination demonstration included the use of a disposable step pad at the exit point of the shower stall before monitoring was conducted. A diagram/flowchart was posted at this facility to show how emergency workers are monitored.

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

2.1.5 Route Alerting Team

- a. **MET:** Objectives 4, 5, 10, and 14
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**

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

2.1.6 Traffic and Access Control

- a. **MET:** Objectives 4, 5, and 17
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.7 Joint Information Center

- a. **MET:** Objectives 2, 4, and 12
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.1.8 School District (Mill Creek Middle School)

- a. **MET:** Objective 16
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE

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

2.1.9 School District (Appeal Elementary School)

- a. **MET:** Objective 16
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2 St. Mary's County

2.2.1 County Emergency Operations Center

- a. **MET:** Objectives 1, 2, 3, 4, 5, 9, 11, 12, 13, 14, 15, and 16
- b. **DEFICIENCY:** Objective 10

Issue No.: 11-02-10-D-01

Description: The first alert and notification (A&N) sequence was not conducted because of miscommunication within the Emergency Operations Center. (NUREG-0654, E.6)

Corrective Action Demonstrated: At 1056, the County Emergency Management Director participated in a conference call for the coordination of a second A&N sequence. At 1059, a decision was made to activate sirens and the Emergency Alert System at 1109 and 1112, respectively. The second A&N sequence was successfully demonstrated.

- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE

e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-03-A-10

Description: A management system for tracking internal and external messages did not exist within the St. Mary's County Emergency Operations Center (EOC). Because of this, the TDD and rebroadcast of emergency alert system messages did not occur. (NUREG-0654, A.1.d and A.2.a)

Corrective Action Demonstrated: St. Mary's County EOC personnel have designed and implemented an electronic tracking system for internal and external messages.

Issue No.: 11-99-10-A-11

Description: The 911 Center TDD System was not used (simulated) during the third alert and notification (A&N) sequence. Consequently, the hearing-impaired individuals living inside and outside the emergency planning zone, but still in St. Mary's County, were not notified to evacuate (if they live north of the intersection of Routes 4 and 5) or to shelter-in-place (if they live south of the intersection of Routes 4 and 5 intersection) during the third A&N sequence. (NUREG-0654, J.10.d)

Corrective Action Demonstrated: The 911 Center TDD System was used to make an actual call and the message was transmitted. Additionally, the response of the other party was recorded.

Issue No.: 11-99-11-A-12

Description: The St. Mary's County-generated emergency alert system (EAS) messages and press announcements did not contain specific features (e.g., numbers, date, times, etc.) that indicate the effective time of the message, what number in the sequence of messages that applies to a particular message, and if and when the message was communicated to the public. (NUREG-0654, E.5 and E.7)

Corrective Action Demonstrated: Calvert and St. Mary's counties use the same EAS radio station. Calvert County sent the EAS message to the radio station on behalf of both counties according to their procedures. The EAS messages sent by Calvert County contained all the appropriate information. The press announcements were adequately prepared, and documentation was generated that indicated the times the announcements were transmitted to the Joint Information Center and media.

Issue No.: 11-99-12-A-14

Description: The media briefings in the St. Mary's County Emergency Operations Center (EOC) did not include all appropriate information related to the emergency situation or action needed to protect the public until prompted by the evaluators playing the role of mock media. (NUREG-0654, E.7 and G.4.a)

Corrective Action Demonstrated: The briefing provided sufficient information related to the emergency situation and the protective actions to be taken by the public in St. Mary's County.

Issue No.: 11-99-12-A-15

Description: Inaccurate information was presented during media briefings conducted at the St. Mary's County Emergency Operations Center (EOC) relating to a Protective Action Decision affecting people at the Patuxent Naval Air Station (PAXNAS). Specifically, the person conducting the briefing advised that personnel had been granted liberal leave after the decision had been announced to shelter these same people. The PAXNAS representative in the EOC subsequently stated that personnel had followed the sheltering instructions. (NUREG-0654, G.4.a)

Corrective Action Demonstrated: No contradictory information related to the PAXNAS was presented during the media briefing. The St. Mary's County officials participating in the media briefing noted that the Naval Air Station has its own response plan, and close contact with the base is assured by the presence of a PAXNAS liaison in the St. Mary's County EOC during the emergency response.

Issue No.: 11-99-14-A-16

Description: The St. Mary's County Health Officer's radiological briefing to emergency workers was lacking information concerning potassium iodide (KI), who should not take KI, and its possible side effects.

Corrective Action Demonstrated: The St. Mary's County Health Officer's radiological briefing included who should take KI, reasons for taking KI, dosages, the time period within which KI should be taken, and possible side effects.

Issue No.: 11-99-11-A-13

Description: The St. Mary's County Emergency Operations Center's message logs do not indicate that instructions were given to the emergency

alert system (EAS) station to rebroadcast the EAS messages, as required by the Public Information Officer (PIO) implementing procedure. (NUREG-0654, E.5)

Corrective Action Demonstrated: The PIO's implementing procedures reflected that the EAS station was contacted to rebroadcast the EAS message.

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

2.2.2 Field Monitoring Team

- a. **MET:** Objectives 4, 5, 6, and 14
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-06-A-17

Description: A radioactive check source was not available to properly check the operational response of the survey instrument used by the St. Mary's County Field Monitoring Team in accordance with FEMA-REP-14. (NUREG-0654, H.10)

Corrective Action Demonstrated: The assistant radiological officer battery checked and source checked each survey meter with a source. Each survey meter passed the battery check and gave a proper response when held to the source in accordance with FEMA-REP-14.

Issue No.: 11-99-06-A-18

Description: There was not an equipment inventory list available in the St. Mary's County Radiological Emergency Response Plan (RERP) concerning the need to inventory equipment prior to deployment to the field in accordance with FEMA-REP-14. (NUREG-0654, H.10)

Corrective Action Demonstrated: The St. Mary's County RERP was revised to include an inventory sheet for the Field Monitoring Team.

Issue No.: 11-99-06-A-19

Description: The St. Mary's County RERP requires that open and closed readings be made at three inches and six feet instead of three inches and waist high (approximately three feet) in accordance with FEMA-REP-14. (NUREG-0654, I.7 and I.8)

Corrective Action Demonstrated: The St. Mary's Radiological Emergency Response Plan, dated July 2001, was revised to indicate readings are to be taken at three inches and three feet.

2.2.3 Reception Center/Mass Care/Emergency Worker Decontamination Center (Mechanicsville FD 01)

- a. **MET:** Objectives 5, 18, 19, and 22
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.4 Route Alerting Team

- a. **MET:** Objectives 4, 5, 10, and 14
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.5 Traffic and Access Control

- a. **MET:** Objectives 4, 5, and 17
- b. **DEFICIENCY:** NONE

- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-97-05/14-A-28

Description: The St. Mary's County Emergency Operations Center (EOC) staff, including the Sheriff and Maryland State Police Barrack Commander, did not instruct their Access Control Point (ACP) personnel to obtain their direct reading dosimeters (DRDs), thermoluminescent dosimeters (TLDs), radiation exposure record cards, and potassium iodide (simulated) prior to their dispatch to the ACPs at Routes 235 and 245 and Routes 4 and 235. (Page 5-2, Attachment 5, St. Mary's County Sheriff Department Procedure.) The extent-of-play agreement required that a number of emergency workers at their field locations have appropriate dosimetry. (NUREG-0654, H.10, J.10.e, J.10.f, and K.3.a)

Corrective Action Demonstrated: The St. Mary's EOC staff conducted a radiological briefing covering exposure limits, radiological hazards, and radiological equipment (TLD, DRD, survey equipment, etc.). Equipment was issued in accordance with St. Mary's County Radiation Exposure Control Procedures.

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

2.2.6 School District (Town Creek Elementary School)

- a. **MET:** Objective 16
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.2.7 School District (Green Holly School)

- a. **MET:** Objective 16
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.3 Dorchester County

2.3.1 County Emergency Operations Center

- a. **MET:** Objectives 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, and 15
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:**

Issue No.: 11-99-14-P-01

Description: No provision was made for documenting ingestion of potassium iodide (KI). (NUREG-0654, J.10.e)

Corrective Action Demonstrated: All emergency workers dispatched from the Dorchester County Emergency Operations Center were issued a Radiation Exposure Record Dosimetry – KI Report Form that included a POTASSIUM IODIDE (KI) section. This section included spaces to document the amount, time, and date of KI ingestion.

Issue No.: 11-99-11-P-02

Description: The Dorchester County Standard Operating Procedures (SOP), Attachment 5, Tab A, identifies only one radio station (WSCL) as the local emergency alert system (EAS) station. WSCL was not included at all in the preset fax list of media outlets during the exercise; therefore, WSCL never

received the EAS messages. However, radio station WCEM was identified as an EAS station in Maryland Emergency Management Agency (MEMA) news releases during the exercise and in various public information materials, and the station was provided with all EAS messages. (NUREG-0654, E.6 and E.7)

Corrective Action Demonstrated: Attachment 5, Tab A of the SOP was revised and a current list of EAS radio and television stations, along with their fax and voice telephone numbers, is maintained by the Public Information Officer (PIO) and programmed into the PIO fax machine and computer.

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

2.3.2 Field Monitoring Team

- a. **MET:** Objectives 4, 5, 6, and 14
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.3.3 Reception Center/Mass Care/Emergency Worker Decontamination Center

- a. **MET:** Objectives 5, 18, 19, and 22
- b. **DEFICIENCY:** NONE
- c. **AREAS REQUIRING CORRECTIVE ACTION:** NONE
- d. **NOT DEMONSTRATED:** NONE
- e. **PRIOR ARCAs – RESOLVED:** NONE
- f. **PRIOR ARCAs – UNRESOLVED:** NONE

2.3.4 Route Alerting Team

- a. **MET:** Objectives 4, 5, 10, and 14

- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs – RESOLVED: NONE**
- f. **PRIOR ARCAs – UNRESOLVED: NONE**

2.3.5 Traffic and Access Control

- a. **MET: Objectives 4, 5, and 17**
- b. **DEFICIENCY: NONE**
- c. **AREAS REQUIRING CORRECTIVE ACTION: NONE**
- d. **NOT DEMONSTRATED: NONE**
- e. **PRIOR ARCAs – RESOLVED: NONE**
- f. **PRIOR ARCAs – UNRESOLVED: NONE**

APPENDIX 1 ACRONYMS AND ABBREVIATIONS

The following is a list of the acronyms and abbreviations that were used in this report.

ACC	Accident Assessment Center
ACP	Access Control Point
ADV	Atmospheric Dump Valve
ARC-CC	American Red Cross – Calvert County Chapter
ARCA	Area Requiring Corrective Action
A&N	Alert and Notification
CCNPP	Calvert Cliffs Nuclear Power Plant
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CFR	Code of Federal Regulations
CVCS	Chemical and Volume Control System
DNB	Departure from Nucleate Boiling
DRD	Direct-Reading Dosimeter
EAL	Emergency Action Level
EAS	Emergency Alert System
ECL	Emergency Classification Level
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	U. S. Environmental Protection Agency
EPZ	Emergency Planning Zone
ERPI	Emergency Response Implementing Procedures
FEMA	Federal Emergency Management Agency
FMT	Field Monitoring Team
HPSI	High Pressure Safety Injection
HSM	Horizontal Storage Module
I&C	Instrument & Controls
ICF	ICF Consulting, Inc.
ISFSI	Independent Spent Fuel Storage Installation
KI	Potassium Iodide
LHGR	Linear Heat Generation Rate
MEMA	Maryland Emergency Management Agency

NRC NUREG-0654	U.S. Nuclear Regulatory Commission 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
PAR	Protective Action Recommendation
PAXNAS	Patuxent Naval Air Station
PIO	Public Information Officer
PSIA	Pounds per Square Inch Atmosphere
RAC	Regional Assistance Committee
RACES	Radio Amateur Civil Emergency Services
RCP	Reactor Coolant Pump
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
RMS	Radiation Monitoring System
RO	Radiological Officer
R/hr	Roentgen(s) per hour
SDC	Shutdown Cooling
SIAS	Safety Injection Actuation Signal
SOP	Standard Operating Procedure
TCP	Traffic Control Point
TDD	Telephone Device for the Deaf
TLD	Thermoluminescent Dosimeter
TSC	Technical Support Center
USDA	United States Department of Agriculture

**APPENDIX 2
EXERCISE EVALUATORS AND TEAM LEADERS**

The following is a list of the personnel who evaluated the Calvert Cliffs Nuclear Power Plant exercise on September 9, 2002, and out-of-sequence activities on August 21-22, 2002. An asterisk following their organization name indicates evaluator Team Leaders. The organization each evaluator represents is indicated by the following abbreviations:

FEMA	Federal Emergency Management Agency
USDA	U.S. Department of Agriculture
EPA	U.S. Environmental Protection Agency
NRC	U.S. Nuclear Regulatory Commission
ICF	ICF Consulting, Incorporated

<u>POSITION</u>	<u>NAME</u>	<u>ORGANIZATION</u>
Regional Assistance Committee Chairperson	D. Hammons	FEMA
Project Officer	Y. Porter	FEMA

Plume Exposure Pathway Exercise (September 9, 2002)

<u>EVALUATION SITE</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
STATE OF MARYLAND		
State Emergency Operations Center (EOC)	J. Price	FEMA*
	A. Lookabaugh	ICF
	R. Marks	ICF
Joint Information Center Accident Assessment – EOF	D. Joyce	FEMA
	R. Trojanowski	NRC

RISK JURISDICTIONS

Calvert County

Calvert County EOC	R. Helo	FEMA*
	P. Carlson	ICF
	T. Green	ICF
Field Monitoring Team	L. Thomas	USDA
Route Alerting Team	R. Shapiro	FEMA
Mass Care Center	M. Geer	ICF
Joint Information Center	L. Ploener	FEMA

Out-of-Sequence Activities (August 22, 2002)

<u>EVALUATION SITE</u>	<u>EVALUATOR</u>	<u>ORGANIZATION</u>
Dorchester County		
Reception Center, Mass Care Emergency Worker Decontamination Station	K. Keyes	FEMA
Traffic and Access Control	K. Keyes	FEMA
Calvert County		
Reception/Mass Care Center (Anne Arundel)	R. Helo	FEMA

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**APPENDIX 3
EXTENT-OF-PLAY AGREEMENT**

CALVEX 2001

**Objectives
and
Extent of Play**

Maryland Emergency Management Agency

Calvert County Emergency Management Agency

Dorchester County Emergency Management Agency

St. Mary's County Emergency Management Agency

Calvert Cliffs Nuclear Power Plant, Inc.

**State of Maryland
Calvert Cliffs Nuclear Power Plant**

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CALVEX 2001

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Introduction

The purpose of this document is to establish the exercise objectives and extent of play parameters expected to be demonstrated during the CALVEX 2001, Calvert Cliffs Nuclear Power Plant Radiological Emergency Preparedness Exercise.

These objectives have been developed through reviews of past exercises, associated plans and procedures, the proposed scenario, applicable FEMA guidance documents, and discussions with appropriate State, local, and FEMA representatives. The objectives were revised on June 5, 2002, to reflect the postponement of CALVEX 2001 from September 25, 2001, to September 9, 2002.

Certain activities may be re-demonstrated by the participants during the exercise if the evaluator determines that activity to be unsatisfactory. Re-demonstration criteria are annotated under the extent-of-play for applicable objectives in *Italics*.

All demonstrations will be conducted according to plans and procedures except as noted in the specific exercise objective and associated extent-of-play agreement.

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**Attachment 1
CALVEX 2001
Objectives and Extent of Play
Out-of-Sequence Activities**

Calvert County

Objective 17: Traffic and Access Control*, **

Objective 18: Reception Center – Monitoring, Decontamination, and Registration*

Objective 19: Congregate Care (Anne Arundel County)

Objective 22: Emergency Workers, Equipment, and Vehicles – Monitoring and
Decontamination*

St. Mary's County

Objective 17: Traffic and Access Control*, **

Objective 18: Reception Center – Monitoring, Decontamination, and Registration*

Objective 19: Congregate Care

Objective 22: Emergency Workers, Equipment, and Vehicles – Monitoring and
Decontamination*

Dorchester County

Objective 17: Traffic and Access Control*, **

Objective 18: Reception Center – Monitoring, Decontamination, and Registration*

Objective 19: Congregate Care

Objective 22: Emergency Workers, Equipment, and Vehicles – Monitoring and
Decontamination*

*Includes evaluation of Objective 5: Emergency Worker Exposure Control

**Includes evaluation of Objective 4: Communications

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Objective 4: COMMUNICATIONS

Demonstrate the capability to communicate with all appropriate emergency personnel at facilities and in the field.

Expected Demonstration:

Communication procedures and equipment will be demonstrated in accordance with plans for all participating State and local jurisdictions. Evaluation of communications with appropriate personnel will be demonstrated by the transmission and receipt of exercise messages. Backup communications will be available and functioning during the exercise but will only be demonstrated if primary systems fail. Communication equipment for the out-of-sequence activities should be demonstrated during scheduled evaluations.

Prior Issues:

None

Objective 5: EMERGENCY WORKER EXPOSURE CONTROL

Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.

Expected Demonstration:

Emergency worker exposure control will be demonstrated as it would in an actual emergency. Actual direct reading dosimeters (DRDs) and thermoluminescent dosimeters (TLDs) will be used. DRDs and TLDs will be distributed to emergency workers who are required to have them at each location. Electrical leakage test records will be inspected during the exercise. Radiation exposure limits and/or turn back values may be obtained through interviews with the Health Officer and emergency workers. Procedures to monitor and record dosimeter readings and manage radiological exposures will be demonstrated by emergency workers in accordance with appropriate plans. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

11-97-05/14-A-28 St. Mary's (EOC rep did not instruct TCP/ACP personnel to obtain DRD, TLD, KI, etc.)

Objective 17: TRAFFIC AND ACCESS CONTROL

Demonstrate the organizational capability and resources necessary to control evacuation traffic flow and to control access to evacuated and sheltered areas.

Expected Demonstration:

Calvert County - The requirement for establishing *all scenario related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - The requirement for establishing *all scenario related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - The requirement for establishing *all scenario related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

None

Objective 18: RECEPTION CENTER - MONITORING, DECONTAMINATION AND REGISTRATION

Demonstrate the adequacy of procedures, facilities, equipment, and personnel for the radiological monitoring, decontamination and registration of evacuees.

Expected Demonstration:

Calvert County (Anne Arundel) - Monitoring and decontamination will be demonstrated at one reception center (Southern High School). Facilities will be set up at the initial monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - Monitoring and decontamination will be demonstrated at one reception center (Maple Elementary School). Facilities will be set up at the initial monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - Monitoring and decontamination will be demonstrated at one reception center (Mechanicsville Volunteer Fire Department). Facilities will be set up at the initial monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the*

FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.

Prior Issues:

None

Objective 19: CONGREGATE CARE

Demonstrate the adequacy of facilities, equipment, supplies, personnel, and procedures for congregate care of evacuees.

Expected Demonstration:

Calvert County - N/A. (Note: Anne Arundel County will set up and demonstrate congregate care at Southern High School.)

Dorchester County - This objective will be demonstrated by interview in accordance with the plans at Cambridge South Dorchester High School. Actual set up of the facility will not be demonstrated. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - This objective will be demonstrated by interview in accordance with the plans at Leonard Hall Drill Hall. Actual set up of the facility will not be demonstrated. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

None

**Objective 22: EMERGENCY WORKERS, EQUIPMENT, AND VEHICLES -
MONITORING AND DECONTAMINATION**

Demonstrate the adequacy of procedures for the monitoring and decontamination of emergency workers, equipment, and vehicles.

Expected Demonstration:

Calvert County - Emergency worker, equipment, and vehicles monitoring and decontamination will be demonstrated at the Calvert County Landfill. Staffing includes a manager and a monitoring and decontamination team. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - Emergency worker, equipment, and vehicles monitoring and decontamination will be demonstrated at the Reception Center. Staffing includes a manager and a monitoring and decontamination team. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - Emergency worker, equipment, and vehicles monitoring and decontamination will be demonstrated at the Reception Center. Staffing includes a manager and a monitoring and decontamination team. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

11-99-22-A-08	Calvert (No thyroid screening performed)
11-99-22-A-09	Calvert (Emergency worker SOP placement – move indoors)

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Attachment 2
CALVEX 2001
Objectives and Extent-of-Play

GROUP A OBJECTIVES

Objective 1: MOBILIZATION OF EMERGENCY PERSONNEL

Demonstrate the capability to alert and fully mobilize personnel for both emergency facilities and field operations. Demonstrate the capability to activate and staff emergency facilities for emergency operations.

Expected Demonstration:

Mobilization of emergency personnel will be demonstrated in accordance with plans and procedures. All activities will be demonstrated as they would in an actual emergency. State and local plans will be utilized to alert, notify, and mobilize emergency personnel, in accordance with declaration of emergency classification levels.–There will be no pre-positioning for the exercise at any locations.

Prior Issues:

None

Objective 2: FACILITIES - EQUIPMENT, DISPLAYS, AND WORK ENVIRONMENT

Demonstrate the adequacy of facilities, equipment, displays and other materials to support emergency operations.

Expected Demonstration:

Facilities, equipment, and displays will be demonstrated in accordance with plans for all participating State and local jurisdictions.

Prior Issues:

None

Objective 3: DIRECTION AND CONTROL

Demonstrate the capability to direct and control emergency operations.

Expected Demonstration:

Direction and control will be demonstrated in accordance with plans for all participating State and local jurisdictions. Maryland Department of the Environment personnel will provide a control cell at the Emergency Operations Facility to simulate participation by the Secretary of the Environment and key personnel. Issue 11-99-03-A-02 will be evaluated during the Peach Bottom exercise scheduled for November 2002.

Prior Issues:

11-99-03-A-02	State (AAC, no ECL PAR information posted)
11-99-03-A-07	Calvert (Route Alert)
11-99-03-A-10	St. Mary's (EOC message tracking)

Objective 4: COMMUNICATIONS

Demonstrate the capability to communicate with all appropriate emergency personnel at facilities and in the field.

Expected Demonstration:

Communication procedures and equipment will be demonstrated in accordance with plans for all participating State and local jurisdictions. Evaluation of communications with appropriate personnel will be demonstrated by the transmission and receipt of exercise messages. Backup communications will be available and functioning during the exercise but will only be demonstrated if primary systems fail. Communication equipment for the out-of-sequence activities should be demonstrated during scheduled evaluations.

Prior Issues:

None

Objective 5: EMERGENCY WORKER EXPOSURE CONTROL

Demonstrate the capability to continuously monitor and control radiation exposure to emergency workers.

Expected Demonstration:

Emergency worker exposure control will be demonstrated as it would in an actual emergency. Actual direct reading dosimeters (DRDs) and thermoluminescent dosimeters (TLDs) will be used. DRDs and TLDs will be distributed to emergency workers who are required to have them at each location. Electrical leakage test records are retained with the annual letter of certification documents and will not be inspected during the exercise. Radiation exposure limits and/or turn back values may be obtained through interviews with the Health Officer and emergency workers. Procedures to monitor and record dosimeter readings and manage radiological exposures will be demonstrated by emergency workers in accordance with appropriate plans. Issue 11-97-05-A-02 will be demonstrated during the scheduled 2003 ingestion pathway exercise. Maryland Department of the Environment field teams will be otherwise evaluated during the Peach Bottom exercise scheduled for November 2002. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

- | | |
|-----------------|--|
| 11-97-05-A-02 | State (State sampling team "A" should demonstrate proper dosimetry) |
| 11-97-5/14-A-28 | St. Mary's (EOC rep did not instruct TCP/ACP personnel to obtain DRD, TLD, KI, etc.) |

Objective 6: FIELD RADIOLOGICAL MONITORING - AMBIENT RADIATION MONITORING

Demonstrate the appropriate use of equipment and procedures for determining field radiation measurements.

Expected Demonstration:

State - Maryland Department of the Environment personnel will provide a control cell at the EOF to simulate participation by the Field Team Leader and to coordinate data with County monitoring teams. Prior issues were resolved during PEACHBEX-00.

Calvert - Ambient radiological monitoring will be demonstrated as it would in an actual emergency. Calvert County will field one monitoring team. At least six monitoring points for each Field Monitoring Team will be demonstrated. Equipment and inventory lists of equipment will be available for evaluation. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester - Ambient radiological monitoring will be demonstrated as it would in an actual emergency. Dorchester County will field one monitoring team. At least six monitoring points for each Field Monitoring Team will be demonstrated. Equipment and inventory lists of equipment will be available for evaluation. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's - Ambient radiological monitoring will be demonstrated as it would in an actual emergency. St. Mary's County will field one monitoring team. At least six monitoring points for each Field Monitoring Team will be demonstrated. Equipment and inventory lists of equipment will be available for evaluation. *During the demonstration of the objective the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

11-99-06-A-05	State (Field Team) (Resolved during PBEX 00)
11-99-06-A-17	St. Mary's (Field Team did not source check meters)
11-99-06-A-18	St. Mary's (Inventory list not available)
11-99-06-A-19	St. Mary's (Field Team plan needs change from 6' to 3' on form)

Objective 7: PLUME DOSE PROJECTION

Demonstrate the capability to develop dose projections and protective action recommendations regarding evacuation and sheltering.

Expected Demonstration:

State - Maryland Department of the Environment personnel will provide a control cell at the EOF to simulate participation by the Accident Assessment Center. Issue 11-99-03-A-03 will be evaluated during the Peach Bottom exercise scheduled for November 2002.

Calvert County - N/A

Dorchester County - N/A

St. Mary's County - N/A

Prior Issues:

11-99-07-A-03	State (AAC) (will be corrected during PEACHBEX 02)
11-99-07-A-02	State (AAC) (will be corrected during PEACHBEX 02)

**Objective 8: FIELD RADIOLOGICAL MONITORING - AIRBORNE
RADIOIODINE AND PARTICULATE ACTIVITY MONITORING**

Demonstrate the appropriate use of equipment and procedures for the measurement of airborne radioiodine concentrations as low as 10^{-7} (0.0000001) microcuries per cubic centimeter in the presence of noble gas and obtain samples of particulate activity in the airborne plume.

Expected Demonstration:

State - Maryland Department of the Environment personnel will provide a control cell at the EOF to simulate participation by the Field Team Leader and to coordinate data with County monitoring teams. Prior issues were resolved during PEACHBEX-00.

Calvert County - N/A

Dorchester County - N/A

St. Mary's County - N/A

Prior Issues:

11-99-08-A-04	State (Field Team) (Resolved During PBEX 00)
11-99-08-A-06	State (Field Team) (Resolved During PBEX 00)

Objective 9: PLUME PROTECTIVE ACTION DECISION MAKING

Demonstrate the capability to make timely protective action decisions (PAD).

Expected Demonstration:

State - Maryland Department of the Environment personnel will provide a control cell at the EOF to simulate participation by the Secretary of the Environment and key personnel. Counties have the responsibility to independently assess protective actions for their portions of the EPZ and have the authority to independently implement a PAD or expand the Secretary's PAD.

Calvert County - In accordance with the plan.

Dorchester County - In accordance with the plan.

St. Mary's County - In accordance with plans.

Prior Issues:

None

Objective 10: ALERT AND NOTIFICATION

Demonstrate the capability to promptly alert and notify the public within the 10-mile plume pathway emergency planning zone (EPZ) and disseminate instructional messages to the public on the basis of decisions by appropriate State or local officials.

Expected Demonstration:

State - The 15-minute capability will be evaluated during the initial sequence when it becomes necessary to inform the public. The 15-minute clock will begin when the State and Counties agree on a Protective Action and the Secretary, Maryland Department of the Environment (to be played by controller personnel) issues a Protective Action Order. Preparation of an appropriate EAS message, with information pertinent to the scenario events will be demonstrated. Siren and EAS activation will be simulated, but procedures will be demonstrated up to the point of siren and EAS activation. Contact with one EAS station will be demonstrated. At least two Alert and Notification sequences will be demonstrated. Primary Alert and Notification is via the siren system. Back up route alerting is used in the event of a siren failure. Back up route alerting procedures will be described to the evaluator. One back up route will be demonstrated in each County. The State EOC does not demonstrate siren or EAS activation.

Calvert County - In accordance with the plans and as stated in the above extent-of-play. The back up route will be: Zone 5, Scientist Cliffs Gate "C" and "D."

Dorchester County - In accordance with the plans and as stated in the above extent-of-play. The back up route alert will be the Taylor's Island perimeter.

St. Mary's County - In accordance with the plans and as stated in the above extent-of-play. The back up route alert will be Zone 7, Joy Chapel Road.

Prior Issues:

11-99-10-A-11 St. Mary's (TDD message not delivered)

Objective 11: PUBLIC INSTRUCTIONS AND EMERGENCY INFORMATION

Demonstrate the capability to coordinate the formulation and dissemination of accurate information and instructions to the public.

Expected Demonstration:

State - N/A

Calvert County - EAS messages that contain appropriate information and instructions will be prepared to inform the public of protective actions, including updates. Follow-up news releases may be used to expand or clarify EAS messages.

Dorchester County - EAS messages that contain appropriate information and instructions will be prepared to inform the public of protective actions, including updates. Follow-up news releases may be used to expand or clarify EAS messages.

St. Mary's County - EAS messages that contain appropriate information and instructions will be prepared to inform the public of protective actions, including updates. Follow-up news releases may be used to expand or clarify EAS messages.

Prior Issues:

11-99-11-A-12	St. Mary's and EAS message and press releases not numbered)
11-99-11-A-13	St. Mary's (EOC log did not indicate rebroadcast of messages per procedure)
11-99-11-P-2	

Objective 12: EMERGENCY INFORMATION – MEDIA

Demonstrate the capability to coordinate the development and dissemination of clear, accurate, and timely information to the news media.

Expected Demonstration:

State - Media briefings will be conducted at the Calvert Cliffs Joint Information Center at the St. John Vianney Parish Center in Prince Frederick, Maryland. Press releases will be generated at the EOC.

Calvert County - Media briefings and press releases will be demonstrated at the Joint Information News Center in Prince Frederick.

Dorchester County - Media briefings and press releases will be demonstrated at the EOC.

St. Mary's County - Media briefings and press releases will be demonstrated at the EOC or County Commissioners briefing room.

Prior Issues:

- | | |
|---------------|---|
| 11-99-12-A-01 | State (Discrepancies in press release regarding County information) |
| 11-99-12-A-14 | St. Mary's (Media brief did not include information about protective actions) |
| 11-99-12-A-15 | St. Mary's (Media brief had inaccurate information regarding PAXNAS protective actions) |

Objective 13: EMERGENCY INFORMATION - RUMOR CONTROL

Demonstrate the capability to establish and operate rumor control in a coordinated and timely manner.

Expected Demonstration:

State - Rumor control will be conducted at the EOC by at least two persons. Each rumor control person will receive a minimum of six calls per hour during emergency phase (Site Area and General Emergency). Equipment for monitoring news broadcasts will be available but will not be operated during the exercise.

Calvert County - Rumor control will be conducted at the EOC by at least two persons. Each rumor control person will receive a minimum of six calls per hour during the emergency phase (Site Area and General Emergency). Equipment for monitoring news broadcasts will be available but will not be operated during the exercise.

Dorchester County - Rumor control will be conducted at the EOC by at least two persons. Each rumor control person will receive a minimum of six calls per hour during the emergency phase (Site Area and General Emergency). Equipment for monitoring news broadcasts will be available but will not be operated during the exercise.

St. Mary's County - Rumor control will be conducted at the EOC by at least two persons. Each rumor control person will receive a minimum of six calls per hour during the emergency phase (Site Area and General Emergency). Equipment for monitoring news broadcasts will be available but will not be operated during the exercise.

Prior Issues:

11-97-13-A-21	Not enough rumor calls to St. Mary's County
11-97-13-A-31	Not enough rumor calls to Dorchester County

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GROUP B OBJECTIVES

Objective 14: IMPLEMENTATION OF PROTECTIVE ACTIONS - USE OF POTASSIUM IODIDE FOR EMERGENCY WORKERS, INSTITUTIONALIZED INDIVIDUALS, AND THE GENERAL PUBLIC.

Demonstrate the capability and resources to implement potassium iodide protective actions for emergency workers, institutionalized individuals, and, if the State plan specifies, the general public.

Expected Demonstration:

The appropriate State or County health officials may decide to authorize the use of potassium iodide (KI) by emergency workers if appropriate. Distribution of KI will be demonstrated with simulated KI. If a decision is made for emergency workers to ingest KI, then it will be administratively discussed during the plume phase exercise for the emergency workers that participated in the out-of-sequence evaluations. There are no institutionalized persons in the Calvert Cliffs EPZ. Supplies of KI may be inspected before or after the exercise at the storage locations. Sealed boxes will not be opened. Inventory lists will be available. The Maryland plan does not call for the distribution of KI to the general public.

State - In accordance with the plan and previous expected demonstration. Maryland Department of the Environment participation in this process will be simulated by a control cell at the EOF.

Calvert County - In accordance with the plan and previous expected demonstration.

Dorchester County - In accordance with the plan and previous expected demonstration.

St. Mary's County - In accordance with the plan and previous expected demonstration.

Prior Issues:

11-99-14-A-16	St. Mary's (RO did not include instructions for KI to emergency workers)
11-97-5/14-A-28	St. Mary's (EOC rep did not instruct TCP/ACP personnel to obtain DRD, TLD, KI, etc.)

Objective 15: IMPLEMENTATION OF PROTECTIVE ACTIONS - SPECIAL POPULATIONS

Demonstrate the capabilities and resources necessary to implement appropriate protective actions for special populations.

Expected Demonstration:

State - N/A

Calvert County - Lists of special populations will be available. Procedures will be described to demonstrate movement of special populations. Calls to transportation providers will be made until sufficient resources are met. Actual vehicles will not be dispatched.

Dorchester County - Lists of special populations will be available. Procedures will be described to demonstrate movement of special populations. Calls to transportation providers will be made until sufficient resources are met. Actual vehicles will not be dispatched.

St. Mary's County - Lists of special populations will be available. Procedures will be described to demonstrate movement of special populations. Calls to transportation providers will be made until sufficient resources are met. Actual vehicles will not be dispatched.

Prior Issues:

None

Objective 16: IMPLEMENTATION OF PROTECTIVE ACTIONS – SCHOOLS

Demonstrate the capability and resources necessary to implement protective actions for school children within the plume pathway emergency planning zone (EPZ).

Expected Demonstration: [This objective will be demonstrated as an out-of-sequence activity.](#)

Calvert County - Completed September 11, 2001.

St. Mary's County - Completed September 11, 2001.

Dorchester County - There are no schools within the 10-mile emergency planning zone in Dorchester County.

Prior Issues:

None

Objective 17: TRAFFIC AND ACCESS CONTROL

Demonstrate the organizational capability and resources necessary to control evacuation traffic flow and to control access to evacuated and sheltered areas.

Expected Demonstration: This objective will be demonstrated as an out-of-sequence activity.

State - N/A

Calvert County - The requirement for establishing *all scenario-related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - The requirement for establishing *all scenario-related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - The requirement for establishing *all scenario-related traffic and access control points for the evacuated or sheltered area will be discussed administratively at the EOC during the plume phase of the exercise.* One TCP/ACP will actually be demonstrated at a pre-determined location. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

None

Objective 18: RECEPTION CENTER - MONITORING, DECONTAMINATION AND REGISTRATION

Demonstrate the adequacy of procedures, facilities, equipment, and personnel for the radiological monitoring, decontamination and registration of evacuees.

Expected Demonstration: This objective will be demonstrated as an out-of-sequence activity.

State - N/A

Calvert County - The capability to determine which reception center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Monitoring and decontamination will be demonstrated at one reception center (Anne Arundel- Southern High School). Facilities will be set up at the initial monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - The capability to determine which reception center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Monitoring and decontamination will be demonstrated at one reception center (Maple Elementary School). Facilities will be set up at the initial monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - The capability to determine which reception center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Monitoring and decontamination will be demonstrated at one reception center (Mechanicsville Volunteer Fire Department). Facilities will be set up at the initial

monitoring point and decontamination area. Complete set up of the facility will be described to the evaluator. Coverings in hallways will not be installed. Facilities will be staffed by at least one-third of the monitoring and decontamination teams required by the plan. At least six evacuees will be monitored. One person will be contaminated above screening limits. Decontamination will be demonstrated by interviews with appropriate individuals. Interviews should include actions involved if the contaminated person cannot be successfully decontaminated at the facility. Registration will be demonstrated at the mass care center. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

None

Objective 19: CONGREGATE CARE

Demonstrate the adequacy of facilities, equipment, supplies, personnel, and procedures for congregate care of evacuees.

Expected Demonstration: This objective will be demonstrated as an out-of-sequence activity in St. Mary's and Dorchester County.

State - N/A

Calvert County - The capability to determine which congregate care center(s) to be activated will be administratively discussed during the September 9th plume phase exercise at Windy Hill Middle School. This objective will be demonstrated by interview in accordance with the plans. Actual set up of the facility will not be demonstrated. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - The capability to determine which congregate care center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. This objective will be demonstrated by interview in accordance with the plans during the September 11 out-of sequence drill at Cambridge South Dorchester High School. Actual set up of the facility will not be demonstrated. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - The capability to determine which congregate care center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. This objective will be demonstrated by interview in accordance with the plans during the September 11-12 out-of-sequence drill at Leonard Hall Drill Hall. Actual set up of the facility will not be demonstrated. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

None

Objective 20: MEDICAL SERVICES – TRANSPORTATION

Demonstrate the adequacy of vehicles, equipment, procedures, and personnel for transporting contaminated, injured, or exposed individuals.

Expected Demonstration: This objective will be demonstrated as a separate drill.

Objective 21: MEDICAL SERVICES – FACILITIES

Demonstrate the adequacy of the equipment, procedures, supplies, and personnel of medical facilities responsible for treatment of contaminated, injured, or exposed individuals.

Expected Demonstration: This objective will be demonstrated as a separate drill.

Objective 22: EMERGENCY WORKERS, EQUIPMENT, AND VEHICLES - MONITORING AND DECONTAMINATION

Demonstrate the adequacy of procedures for the monitoring and decontamination of emergency workers, equipment, and vehicles.

Expected Demonstration: This objective will be demonstrated as an out-of-sequence activity.

State - N/A

Calvert County - The capability to determine which emergency worker decontamination center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Emergency worker, equipment, and vehicle monitoring and decontamination are located at the Calvert County Landfill. Staffing includes a manager and a monitoring and decontamination team. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Dorchester County - The capability to determine which emergency worker decontamination center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Emergency worker monitoring and decontamination is co-located with the Reception Center and the evacuee monitoring and decontamination center. Staffing includes a manager and a monitoring and decontamination team. Emergency equipment, and vehicles monitoring and decontamination will be demonstrated across the street from the reception center. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

St. Mary's County - The capability to determine which emergency worker decontamination center(s) to be activated will be administratively discussed during the September 9th plume phase exercise. Emergency worker, equipment, and vehicle monitoring and decontamination are co-located with the Reception Center and the evacuee monitoring and decontamination center. Staffing includes a manager and a monitoring and decontamination team. At least one vehicle will be simulated contaminated. Decontamination of the vehicle will be demonstrated through interviews with the appropriate personnel. *During the demonstration of the objective, the FEMA evaluator will have the participants re-demonstrate an activity that is determined to be not satisfactorily demonstrated.*

Prior Issues:

11-99-22-A-08	Calvert (No thyroid screening performed)
11-99-22-A-09	Calvert (Emergency worker SOP placement – move indoors)

Objective 23: SUPPLEMENTARY ASSISTANCE (FEDERAL/OTHER)

Demonstrate the capability to identify the need for external assistance and to request such assistance from Federal or other support organizations.

Expected Demonstration:

The State will demonstrate requesting Federal assistance in accordance with plans. Actual notification of the Federal agencies will be made, however, Federal participation will not be demonstrated. Maryland Department of the Environment requests for radiological assistance will be simulated by a control cell at the EOF.

Prior Issues:

None

Group C Objectives

None

Prior Issues:

None

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APPENDIX 4 EXERCISE SCENARIO SYNOPSIS

SP-4 GENERAL DESCRIPTION

The scenario begins with Unit 1 at 100 percent power. Unit 2 is in Mode 6 with a fuel shuffle complete. At turnover, the Loose Parts Monitor is in alarm. 13 High Pressure Safety Injection (HPSI) pump is tagged out of service to replace the inboard mechanical seal. The 13 HPSI pump and other components that are out service do not affect the outcome of the scenario.

At scenario time 00:00, a vehicle enters the site through the main gate, shows a badge and proceeds to the Independent Spent Fuel Storage Installation (ISFSI). The driver crashes through the ISFSI Protected Area gate and comes to rest against a Horizontal Storage Module (HSM). The driver of the vehicle flees into the woods. Security will respond and notify the Control Room. Security discovers that the suspect is carrying incendiary material (thermite) in the vehicle.

By scenario time 00:11, the Shift Manager will declare an Unusual Event for EAL, TU1. "Security reports the following on-site event: confirmed intrusion into the ISFSI Protected Area."

At scenario time 00:13, a pressurizer pressure protection channel fails low due to the loss of the power supply for the 1-PT-102C transmitter. Operations will review the Technical Specifications action for placing the bistable in bypass and will call Instrument & Controls (I&C) for interim maintenance.

At scenario time 00:18, the 11B Reactor Coolant Pump (RCP) rotor locks. The Activity Monitor (1-RR-202) alarms off scale high for gross activity. About five percent of the total core fuel pins fail due to departure from nucleate boiling (DNB) causing localized damage to the fuel in Quadrant 2. The reactor fails to trip automatically on low flow. The manual trip button fails. Operations will trip the reactor via EOP-0, "Post Trip Immediate Actions," "alternate actions," by deenergizing the Control Element Drive Mechanism (CEDM) Motor Generator Sets.

By scenario time 00:19, the reactor trips and 11 Atmospheric Dump Valve (ADV) opens and sticks in the full open position. Three Control Element Assemblies (CEAs) in the damaged quadrant fail to insert causing an additional five percent fuel failure due to the linear heat generation rate (LHGR) and DNB. Fuel failure totals ten percent of the core.

By scenario time 00:26, Operations will dispatch an operator to manually isolate the ADV to bring the excess steam demand under control. The operator will report that the ADV manual isolation valve has been tampered with and the valve can not be operated. Dose rates in the area of the ADV manual isolation valve and the ADV are elevated due to increased radioactivity in the steam system due to the failed fuel.

SP-4 GENERAL DESCRIPTION, CONTINUED

By scenario time 00:30, Operations will call Mechanical Maintenance to evaluate and expedite repair of the ADV manual isolation valve and notify Security of the suspected tampering.

By scenario time 00:36, Operations will exit EOP-0, "Post Trip Immediate Actions" and implement EOP-4, "Excess Steam Demand" and then the Shift Manager will evaluate the Emergency Response Implementing Procedures (ERIP). Operations will evaluate the alarm manual for the high Activity Monitor alarm and call Chemistry to validate the Radiation Monitoring System (RMS) reading with an RCS sample. Tampering (sabotage) will be confirmed in the main steam penetration room (an area of concern for safe shutdown).

By scenario time 00:39, the Shift Manager will declare a Site Emergency for EAL TS1, "Security reports the following event in an area of concern for safe shutdown: confirmed tampering (sabotage)."

At scenario time 00:41, Operations will start HPSI and block Safety Injection Actuation Signal (SIAS). The 11 HPSI pump fails to start due to a failed breaker (152-1108). Operations will dispatch an operator to investigate the 11 HPSI pump and will call Electrical Maintenance to swap breakers to restore HPSI. Mechanical Maintenance will expedite repair and restoration of 13 HPSI to service. Operations will start 12 HPSI pump.

By scenario time 00:47, Chemistry will report that dose rates in the sample room are 1,650 milliRoentgen per hour (mR/h). The Shift Manager will review ERIP 3.0, "Fission Barrier Reference Table," "Fuel Clad Barrier," "SEC Judgment," and recognize that the fuel clad barrier is lost based on "Degraded ability to monitor barrier."

By scenario time 01:09, the Emergency Response Organization will be staffed and the Control Room will be relieved of interim ERIP duties.

At scenario time 01:55, two tubes in 11 Steam Generator rupture. The leak rate exceeds the Chemical and Volume Control System (CVCS) capacity. Operations will exit EOP-4, "Excess Steam Demand," and enter EOP-8, "Functional Recovery Procedure."

By scenario time 02:10, the Site Emergency Coordinator will declare a General Emergency for EAL, BG1, "Loss of two barriers and potential loss of a third barrier." The Dose Assessment Office will project that the offsite dose will exceed Protective Action Guides beyond the site boundary, based on evaluation of the readings from the Main Steam System Radiation Monitor. The Site Emergency Coordinator will recommend evacuation of Protective Action Zone 1.

SP-4 GENERAL DESCRIPTION, CONTINUED

At scenario time 02:30, law enforcement authorities apprehend the driver of the vehicle that has crashed into the ISFSI Protected Area. The law enforcement authorities notify Security that the suspect has confessed that he has tampered with the ADV manual isolation valve. Security will provide the Operational Support Center with information that will explain the tampering problem and will lead to the restoration of the ADV manual isolation valve function.

By scenario time 03:30, Operations will begin the line up to put the plant on Shutdown Cooling (SDC).

By scenario time 04:00, Operations will initiate SDC when the RCS is below 300 Pounds per Square Inch Atmosphere (PSIA) and 300 degrees. The Technical Support Center (TSC) will estimate that the fuel damage is between five and 10 percent based on radiological analysis. The TSC will classify the core damage as NRC Fuel Damage Category #2 based on evaluation of the Core Damage Assessment ERIPs.

At scenario time 05:00, Mechanical Maintenance repairs the ADV manual isolation valve. Operations will close the ADV manual isolation valve terminating the release of radioactive steam.

The time line of this scenario provides estimated event times. Activities in this scenario are performed live, in real time, on the Plant Control Room Simulator. Participant actions determine the actual timing of the events.

The Dose Assessment Office will assess downwind radioactivity transport, using prepared meteorological data and meteorological forecasts.

Calvert Cliffs Nuclear Power Plant (CCNPP) will recommend protective actions for the public. The State and Counties will implement protective actions to reduce the exposure of the public to the accidental release of radioactive material.

CCNPP will determine the magnitude of the release and estimate the location of the offsite impact. CCNPP will monitor the release with the Main Steam System Radiation Monitor and dispatch field teams to obtain downwind samples to define the location of the plume.

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

Onsite, the exercise will terminate at scenario time 06:00, or earlier, when the onsite objectives are met.

Offsite, the exercise will continue specific activities until the offsite objectives are met.

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APPENDIX 5 PLANNING ISSUES

This appendix contains the description and status of the Planning Issue that was assessed during the Calvert Cliffs Nuclear Power Plant.

Issue No.: 11-02-19-P-01

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)

Recommendation: The plan should be modified to include the correct list. Any modifications should be reviewed by the ARC-CC prior to implementation.

Schedule of Corrective Action: The Calvert County plan will be revised to include the correct list of mass care centers.

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APPENDIX 6 PRIOR ISSUES NOT SCHEDULED TO BE DEMONSTRATED

This appendix contains the description and status of ARCAs that were assessed during prior exercises at CCNPP. They were assessed either at jurisdiction or functional entities exempt from demonstration at this exercise or for ingestion exposure pathway objectives not scheduled for demonstration during this exercise.

PRIOR ISSUES AT JURISDICTION OR FUNCTIONAL ENTITIES NOT SCHEDULED TO BE DEMONSTRATED

Accident Assessment (State EOF)

Issue No.: 11-99-03-A-02

Description: The Dose Assessment staff at the Emergency Operations Facility (EOF) were not kept informed on a timely basis of changing plant and emergency conditions, nor of Protective Action Recommendations (PAR) and Protective Action Decisions (PAD) being considered or implemented. The radio communicator for the Field Monitoring Teams (FMT) did not inform the FMTs of the General Emergency declaration, release conditions and magnitude, when the plume was expected to reach them, and PADs being implemented, etc. The radio communicator also failed to provide the directive to ingest potassium iodide to FMT-B and verify when taken. (NUREG-0654, A.1.d., A.2.a., and J.10.f.)

Reason ARCA Unresolved: The Dose Assessment staff was not scheduled to participate in the September 9, 2002, plume exposure pathway exercise.

Recommendation: Dose Assessment staff should demonstrate their capabilities during the Peach Bottom Atomic Power Station exercise scheduled for November 19, 2002.

Schedule of Corrective Action: This activity was successfully demonstrated during the November 19, 2002 Peach Bottom Exercise.

Issue No.: 11-99-07-A-03

Description: The Dose Assessment staff was unable to relate field measurement radioiodine data to a projected thyroid dose commitment or to the appropriate Protective Action Guide. The current procedure was not used for the manual calculation and difficulty in performing the calculations resulted in apparent projections that severely underestimated the doses. When the calculations were performed using the RASCAL computer program, improperly converted input data were entered, resulting in apparent doses six orders of magnitude low. (NUREG-0654, I.10.)

Reason ARCA Unresolved: The Dose Assessment staff was not scheduled to participate in the September 9, 2002, plume exposure pathway exercise.

Recommendation: Dose Assessment staff should demonstrate their capabilities during the Peach Bottom Atomic Power Station exercise scheduled for November 19, 2002.

Schedule of Corrective Action: This activity was successfully demonstrated during the November 19, 2002 Peach Bottom Exercise.

PRIOR ISSUES FOR INGESTION EXPOSURE PATHWAY OBJECTIVES

State Sampling Team

Issue No.: 11-97-05-A-02

Description: Dosimetry devices were issued to emergency workers in accordance with the plan and procedures. The high-range dosimeters had a range of either 0-100 R or 0-200 R. Therefore, individuals could not read the 1 R exposure limit at the following locations:

- Calvert County Reception Center
- Emergency Worker Decontamination Center
- Traffic and Access Control Points (TCP/ACP)
- St. Mary's Field Monitoring Team (FMT)
- State FMT and Sampling Team A (NUREG-0654, K.3.b and K.4)

Reason ARCA Unresolved: The State sampling teams were not scheduled to demonstrate Objective 24 during the 1999 exercise.

Recommendation: State sampling teams should demonstrate their capabilities during the next ingestion exercise.

Issue No.: 11-97-24-A-07

Description: Sampling Team A did not demonstrate good contamination control procedures, as they occasionally placed their survey meter and sampling tools on potentially contaminated ground while samples were being taken. (NUREG-0654, I.8 and J.11)

Reason ARCA Unresolved: The State sampling teams were not scheduled to demonstrate Objective 24 during the 1999 exercise.

Recommendation: State sampling teams should demonstrate their capabilities during the next ingestion exercise.

Issue No.: CCX91-35R

Description: A soil sample was collected from an area covered with soybean debris that was first removed before IPS Team A acquired the sample. (Objective 24; NUREG-0654, I.8)

Reason ARCA Unresolved: The state sampling teams were not scheduled to demonstrate Objective 24 during the 1999 exercise.

Recommendation: State sampling teams should demonstrate their capabilities during the next ingestion exercise.

Washington D.C. EOC

Issue No.: CCX91-36R

Description: The Emergency Broadcast System (EBS) message referenced that the exercise was a test for the city's agencies to practice their skills at responding to "hazardous chemicals" rather than to a "General Emergency" at CCNPP. (Objective 11; NUREG-0654, E.5 and G.4.b)

Reason ARCA Unresolved: The Washington D.C. EOC was not scheduled to demonstrate objective 11 during the 1997 exercise.

Recommendation: The Washington D.C. EOC should demonstrate Objective 11 during the next ingestion exposure pathway exercise.

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