



**FEMA**

JUN 02 2011

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

To Whom It May Concern:

Enclosed is the After Action Report/Improvement Plan for the Limerick Generating Station (LGS) Ingestion Radiological Emergency Preparedness Exercise that was held on March 08-10, 2011.

There were no deficiencies identified during the exercise. Three Areas Requiring Corrective Action (ARCAs) were identified; two were immediately re-demonstrated successfully and one other was re-demonstrated successfully on April 21, 2011. Three ARCAs from a previous Peach Bottom Atomic power Station (PBAPS) exercise were successfully re-demonstrated. Two new planning issues were identified and have been resolved.

Based on the results of the exercise, the offsite radiological emergency response plans and procedures for the Commonwealth of Pennsylvania, and the affected local jurisdictions, site-specific to the Limerick Generating Station 50-Mile Emergency Planning Zone, were adequately demonstrated and there is reasonable assurance that the plans are adequate and can be implemented, as demonstrated in the exercise.

If you have any questions, please contact Michael E. Shuler, Sr. at (215) 931-5526.

Sincerely,

A handwritten signature in black ink, appearing to read "MaryAnn Tierney".

MaryAnn Tierney  
Regional Administrator

Enclosure

AK45  
MRR



Limerick Generating Station

# After Action Report/ Improvement Plan

Exercise Date - March 08, 2011

Radiological Emergency Preparedness (REP) Program



**FEMA**

*Published June 03, 2011*

This page is intentionally blank.

---

# Limerick Generating Station After Action Report/Improvement Plan

*Published June 03, 2011*

## Contents

Executive Summary	4
Section 1: Exercise Overview	6
1.1 Exercise Details	6
1.2 Exercise Planning Team Leadership	6
1.3 Participating Organizations	12
Section 2: Exercise Design Summary	15
2.1 Exercise Purpose and Design	15
2.2 Exercise Objectives, Capabilities and Activities	19
2.3 Scenario Summary	20
Section 3: Analysis of Capabilities	23
3.1 Exercise Evaluation and Results	23
3.2 Summary Results of Exercise Evaluation	23
3.3 Criteria Evaluation Summaries	27
3.3.1 Maryland Jurisdictions	27
3.3.1.1 Maryland Emergency Operations Center	27
3.3.2 Risk Jurisdictions	27
3.3.2.1 Cecil County Emergency Operations Center (I)	27
3.3.3 Pennsylvania Jurisdictions	27
3.3.3.1 Pennsylvania Emergency Operations Center	27
3.3.3.2 Pennsylvania Joint Information Center	28
3.3.3.3 Pennsylvania Accident Assessment Center, State Emergency Operations Center-Bureau of Radiation Protection	28
3.3.3.4 PA State Laboratory	29
3.3.3.5 PA State Field Sampling Team A, South East Region	30
3.3.3.6 PA State Field Sampling Team B, South East Region	33
3.3.4 Risk Jurisdictions	34

---

3.3.4.1 Berks County Emergency Operations Center (I)	35
3.3.4.2 Bucks County Emergency Operations Center (I)	35
3.3.4.3 Carbon County Emergency Operations Center (I)	35
3.3.4.4 Chester County Emergency Operations Center (I)	35
3.3.4.5 Delaware County Emergency Operations Center (I)	36
3.3.4.6 Lancaster County Emergency Operations Center (I)	37
3.3.4.7 Lebanon County Emergency Operations Center (I)	38
3.3.4.8 Lehigh County Emergency Operations Center (I)	38
3.3.4.9 Monroe County Emergency Operations Center (I)	38
3.3.4.10 Montgomery County Emergency Operations Center (I)	38
3.3.4.11 Northampton County Emergency Operations Center (I)	39
3.3.4.12 Philadelphia City/County Emergency Operations Center (I)	39
3.3.4.13 Schuylkill County Emergency Operations Center (I)	39
3.3.4.14 York County Emergency Operations Center (I)	40
Section 4: Conclusion	42
Appendix A: Exercise Timeline	43
Appendix B: Exercise Evaluators and Team Leaders	44
Appendix C: Acronyms and Abbreviations	46
Appendix D: Exercise Plan	48



---

## EXECUTIVE SUMMARY

During the week of March 7, 2011, an evaluated Post Plume Ingestion Exercise was conducted for the 50-mile Ingestion Exposure Pathway, Emergency Planning Zone (EPZ) around the Limerick Generating Station (LGS) by the Federal Emergency Management Agency (FEMA), Region III. Out of sequence baseline evaluations were conducted for three facilities within the 50 mile ingestion zone on January 26, 2011, and February 22, 2011. The last FEMA evaluated full-scale exercise at this site was conducted on November 16, 2009.

The purpose of the Limerick Ingestion Exposure Pathway exercise was to assess the State and local offsite response organizations preparedness in responding to a radiological emergency. The exercise was held in accordance with FEMA's policies and guidance concerning the exercising of State and local Radiological Emergency Response Plans (RERP) and procedures.

FEMA wishes to acknowledge the efforts of the many individuals in the Commonwealth of Pennsylvania; their risk jurisdictions: Berks, Chester, and Montgomery Counties; the ingestion jurisdictions of Bucks, Carbon, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Northampton, Philadelphia, Schuylkill, and York Counties; State of Maryland; and Cecil County (MD) who were evaluated during this exercise.

Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still others have willingly sought this responsibility as volunteers providing vital emergency services twenty four (24) hours a day to the communities in which they live. Cooperation and teamwork of all the participants was observed during this exercise.

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

- Facility baseline evaluation conducted for Philadelphia County Emergency Operations Center on January 26, 2011.
- Facility baseline evaluation conducted for Delaware and Northampton County Emergency Operations Centers on February 22, 2011.

The Commonwealth of Pennsylvania, State of Maryland, and their respective local organizations,

---

demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. There were no Deficiencies, although three (3) Areas Requiring Corrective Action (ARCAs) were identified as a result of this exercise. Two of the ARCAs were successfully re-demonstrated during the exercise. There were three (3) ARCAs from a previous Peach Bottom Atomic Power Station (PBAPS) ingestion exercise that were successfully redemonstrated during this exercise. Two (2) new planning issues were identified.

---

## **SECTION 1: EXERCISE OVERVIEW**

### **1.1 Exercise Details**

**Exercise Name**

Limerick Generating Station

**Type of Exercise**

Ingestion

**Exercise Date**

March 08, 2011

**Program**

Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

**Scenario Type**

Radiological Emergency

### **1.2 Exercise Planning Team Leadership**

Michael Shuler, Sr.

Project Officer/Site Specialist

Department of Homeland Security/FEMA

Technological Hazards Program Specialist

One Independence Mall, 6th Floor

615 Chestnut Street

Philadelphia, Pennsylvania, 19106

215-931-5526

michael.shuler@dhs.gov

Alan Brinser

Exercise Supervisor

Pennsylvania Emergency Management Agency

Emergency Management Specialist

2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2217  
abrinser@state.pa.us

William Wagner  
Exercise Planning Team  
Department of Environmental Protection  
Bureau of Radiation Protection, Section Chief  
Rachel Carson State Office Building  
400 Market Street  
Harrisburg, Pennsylvania, 17101  
717-783-6003  
wwagner@state.pa.us

Martin Vyeniolo  
Technical Reviewer  
Department of Homeland Security/FEMA  
Technological Hazards Specialist  
One Independence Mall  
615 Chestnut Street  
Philadelphia, Pennsylvania, 19106  
215-931-5670  
martin.vyeniolo@dhs.gov

Steve Flickinger  
Exercise Planning Team  
Cecil County Department of Emergency Services  
Emergency Planner  
107 Chesapeake Boulevard  
Suite 108  
Elkton, Maryland, 21921  
410-392-2037

steve.flickinger@ccdps.org

Jesse Wells  
Planning Coordination  
Pennsylvania Emergency Management Agency  
Emergency Management Specialist  
2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2190  
jewells@state.ps.us

Henry Tamanini  
Planning Coordination  
Pennsylvania Emergency Management Agency  
Chief, Technological Hazards Division  
2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2723  
hetamanini@state.pa.us

Jeffrey Dean  
Off-Site EP Coordination  
Exelon Nuclear  
Off-Site EP Coordinator  
298 Longview Road  
Royersford, Pennsylvania, 19468  
610-718-2022  
jeffrey.dean@exeloncorp.com

John Price  
Alternate Site Specialist  
Department of Homeland Security/FEMA  
Senior Technological Hazards Program Specialist

---

One Independence Mall  
615 Chestnut Street  
Philadelphia, Pennsylvania, 19106  
215-931-5570  
john.price@dhs.gov

Victor Wilson, Sr.  
Exercise Planning Team  
Pennsylvania Emergency Management Agency  
Emergency Management Specialist  
2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2136  
vicwilson@state.pa.us

Derek Ruhl  
Exercise Planning Team  
Pennsylvania Department of Agriculture  
Emergency Preparedness & Safety Coordinator  
2301 North Cameron Street  
Harrisburg, Pennsylvania, 17110  
717-783-3577  
druhl@state.pa.us

Frederick Frey  
Exercise Planning Team  
Maryland Emergency Management Agency  
Agency Planner  
5401 Rue Saint Lo Drive  
Reisterstown, Maryland, 21136  
410-517-3613  
ffrey@mema.state.md.us

Kevin Anderson  
Exercise Planning Team  
Department of Environmental Protection  
Water Supply Representative  
Rachel Carson State Office Building  
400 Market Street  
Harrisburg, Pennsylvania, 17101  
717-783-9764  
kanderson@state.pa.us

David Williams  
Exercise Planning Team  
Pennsylvania Emergency Management Agency, Eastern Area  
Emergency Management Specialist  
3560 Old Route 22  
Hamburg Center  
Hamburg, Pennsylvania, 19526  
610-562-3014  
davidwi@state.pa.us

Ruth Miller  
Exercise Planning Team  
Pennsylvania Emergency Management Agency  
Deputy, Press Secretary  
2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2161  
ruthmiller@state.pa.us

Aaron Rhone  
Logistics Support  
Pennsylvania Emergency Management Agency  
Emergency Management Specialist

---

2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2714  
arhone@state.pa.us

Steve Kiouttis  
Exercise Planning Team  
Pennsylvania Emergency Management Agency  
Geographic Information System, Coordinator  
2605 Interstate Drive  
Harrisburg, Pennsylvania, 17110  
717-651-2226  
skiouttis@state.pa.us

James Barnhart  
Exercise Planning Team  
Department of Environmental Protection  
Radiation Health Physicist II, BRP  
Rachel Carson State Office Building  
400 Market Street  
Harrisburg, Pennsylvania, 17101  
717-772-0178  
jbarnhart@state.pa.us

Gerald Hovath  
Exercise Planning Team  
Department of Environmental Protection  
Radiation Health Physicist II, BRP  
Rachel Carson State Office Building  
400 Market Street  
Harrisburg, Pennsylvania, 17101  
717-783-5919  
ghovath@state.pa.us

## 1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Limerick Generating Station exercise:

### State Jurisdictions

Pennsylvania Emergency Management Agency  
Pennsylvania Department of Health  
Pennsylvania State Cooperative Extension  
Pennsylvania Bureau of Radiation Protection  
Pennsylvania Department of Environmental Protection, Bureau of Laboratories  
Pennsylvania Department of Environmental Protection  
Pennsylvania Department of Agriculture  
Pennsylvania Office of Administration (Geospatial Technologies Bureau)  
Pennsylvania Department of Aging  
Pennsylvania Department of Banking  
Pennsylvania Office of Attorney General  
Pennsylvania Department of Community and Economic Development  
Pennsylvania Department of Education  
Pennsylvania Department of Insurance  
Pennsylvania Department of Labor and Industry  
Pennsylvania Department of Public Welfare  
Pennsylvania Department of Revenue  
Pennsylvania Department of Transportation  
Pennsylvania Public Utility Commission  
Pennsylvania Department of Corrections  
Pennsylvania Department of General Services  
Pennsylvania Department of Military and Veteran Affairs  
Pennsylvania Fish and Boat Commission  
Pennsylvania Game Commission  
Pennsylvania Liquor Control Board  
Pennsylvania Office of General Counsel  
Pennsylvania State Police  
Pennsylvania Turnpike Commission  
Human Relations Commission

## PENNVEST

### Risk Jurisdictions

- Berks County Department of Emergency Services
- Berks County Geospatial Information Systems
- Berks County Penn State Cooperative Extension
- Berks County Commissioners Office
- Chester County Department of Emergency Services
- Chester County Penn State Cooperative Extension
- Montgomery County Department of Public Safety
- Montgomery County Penn State Cooperative Extension

### Support Jurisdictions

- Bucks County Emergency Management Agency
- Bucks County Penn State Cooperative Extension
- Carbon County Emergency Management Agency
- Carbon County Penn State Cooperative Extension
- Maryland Emergency Management Agency
- Maryland Department of the Environment
- Cecil County Emergency Management Agency (Maryland)
- Delaware County Emergency Services Department
- Delaware County Penn State Cooperative Extension
- Harford County Department of Emergency Operations (Maryland)
- Lancaster County Emergency Management Agency
- Lancaster County Penn State Cooperative Extension
- Lebanon County Emergency Management Agency
- Lebanon County Penn State Cooperative Extension
- Lehigh County Office of Emergency Management
- Lehigh County Penn State Cooperative Extension
- Monroe County Office of Emergency Management
- Monroe County Penn State Cooperative Extension
- Northampton County Emergency Management Services
- Northampton County Penn State Cooperative Extension
- City of Philadelphia Office of Emergency Management
- Philadelphia County Penn State Cooperative Extension
- Schuylkill County Emergency Management Agency

**Schuylkill County Penn State Cooperative Extension**

**York County Office of Emergency Management**

**York County Penn State Cooperative Extension**

**Private Organizations**

**American Red Cross**

**Millersville University**

**Federal Jurisdictions**

**US Department of Agriculture, Farm Service Agency (USDA)**

**Federal Radiological Monitoring and Assessment Center (FRMAC)**

**Nuclear Regulatory Commission (NRC)**

---

## **SECTION 2: EXERCISE DESIGN SUMMARY**

### **2.1 Exercise Purpose and Design**

On December 7, 1979, the President directed the Federal Emergency Management Agency (FEMA) to assume the lead responsibility for all off-site nuclear planning and response.

FEMA's activities were conducted pursuant to 44 Code of Federal Regulations (CFR) Parts 350, 351 and 352. These regulations are a key element in the Radiological Emergency Preparedness (REP) Program that was established following the Three Mile Island Nuclear Station accident in March 1979.

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

- A. Taking the lead in offsite emergency planning and in the review and evaluation of Radiological Emergency Response Plans (RERPs) and procedures developed by State and local governments;
- B. 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;
- C. Responding to requests by the U.S. Nuclear Regulatory Commission (NRC) pursuant to the Memorandum of Understanding between the NRC and FEMA dated June 17, 1993 (Federal Register, Vol. 58, No. 176, September 14, 1993); and
- D. 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 Region III Radiological Assistance Committee (RAC), which is chaired by FEMA. A REP Post-Plume Ingestion Exercise was conducted March 8th 9th and 10th, 2011, 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 Limerick Generating Station (LGS). The purpose of this exercise report is to present the exercise results and findings on the performance of the off-site response organizations (OROs) 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 FEMA Headquarters. These reports are provided to the NRC and participating States. State and local governments utilize the findings contained in these reports for the purposes of planning, training, and improving emergency response capabilities.

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

- A. 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;
- B. FEMA Guidance Memoranda MS-1, "Medical Services," November 1986;
- C. FEMA-REP-14, "Radiological Emergency Preparedness Exercise Manual," September 1991;
- D. 66 FR 47546, "FEMA Radiological Emergency Preparedness: Alert and Notification," September 12, 2001; and
- E. 67 FR 20580, "FEMA Radiological Emergency Preparedness: Exercise Evaluation

---

Methodology,” April 25, 2002.

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

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

Section 3 of this report, entitled "Analysis of Capabilities", presents detailed "Exercise Evaluation and Results" information on the demonstration for each jurisdiction or functional entity evaluated in a jurisdiction-based, issue-only format (Criteria Evaluation Summaries).

Section 4, "Conclusion", is a description of the Region's overall assessment of the capabilities of the participating organizations. It also presents information on planning issues (both new planning issues identified during this exercise and resolved planning issues identified during previous exercises):

This section also contains:

(1) descriptions of all Deficiencies and Areas Requiring Corrective Action (ARCAs) assessed during this exercise, recommended corrective actions, and the Tribal, State, and local governments' schedule of corrective actions for each identified exercise issue and

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

The final section of the report is comprised of the appendices, which present the following supplementary information: Improvement Plan, Exercise Timeline, Exercise Evaluators and Team Leaders, Acronyms and Abbreviations, and Exercise Plan.

Contained in this section is a basic description of the plume pathway emergency planning zone (EPZ).

Exelon Nuclear's Limerick Generating Station (LGS) is located in southeastern Pennsylvania on

the Schuylkill River about 1.7 miles southeast of Pottstown Borough. The river passes through the site, separating the western portion, which is in East Coventry Township in Chester County, from the eastern portion, which is in Limerick and Lower Pottsgrove Townships in Montgomery County. The plant is owned and operated by Exelon Nuclear. Two boiling water reactors each generate an electrical output of 1,050 megawatts (MW). Unit 1 was issued a full-power license in August 1985; commercial operations began in February 1986. Unit 2 was issued a full-power license in August 1989 with commercial operations beginning in January 1990.

The site encompasses 595 acres and is divided into three (3) parts. The principal portion, where the major operating equipment and buildings are located, is on the east bank of the Schuylkill River. This portion is separated from the second segment, where the cooling water intake is located, near the main line of the Reading Railroad. The third portion lies on the west bank of the river, adjacent to Conrail railroad tracks. The site coordinates are approximately 40°13'27"N and 75°35'15"W.

The minimum exclusion distance for the LGS is 2,500 feet from the center of each reactor. The utility owns all the land within the exclusion area. No private residences are located within the exclusion area; however, some farming may be permitted.

There are 165 sirens installed to cover the 10-mile plume exposure pathway EPZ. These sirens are activated three (3) minutes before the Emergency Alert System (EAS) messages issued by the Commonwealth of Pennsylvania are broadcast.

Soils in this area are of the Reaville-Penn-Klinesville Association and are characteristic of rolling uplands. They are underlain by sedimentary rocks of the Brunswick Formation, consisting mostly of red shale with some fine-grained sandstone interbedding.

The normal pool elevation of the Schuylkill River in this area is 200 feet above mean sea level (msl). The topography of the area is hilly, with elevations ranging from 100-300 feet above msl within five (5) miles of the site. The plant is approximately 217 feet above msl.

The climate in this area is dominated by prevailing westerly winds that produce humid, continental-type weather characterized by warm summers and moderately cold winters. Montgomery County is the warmest part of Pennsylvania, with an average annual temperature of 57°F. Annual precipitation is approximately 42 inches. The area in the immediate vicinity of the

plant is made up mostly of agricultural and other open land. The Pottstown Borough in Montgomery County is the nearest community and has a population of 21,859 based on the 2000 Census. The nearest major population center (more than 25,000 people) is Philadelphia that lies 25 miles to the southeast of the site.

Two major industries employ a total of 850 persons within two (2) miles of the plant. Two small airfields are also located nearby. A small private airfield is about one (1) mile to the northeast, but its runway is oriented so that the flight path does not pass over the plant. The Pottstown Municipal Airport is 4.3 miles northwest of the site. The LGS does not lie in the approach pattern for this airport.

No major thoroughfares are located in the immediate vicinity of the plant. The main line of the Reading Railroad runs along the north bank of the Schuylkill River and traverses the site about 500 feet from the plant.

## 2.2 Exercise Objectives, Capabilities and Activities

Limerick Generating Station 2011 Post Plume Ingestion Exposure Pathway exercise was a Functional Exercise (FE) evaluated by the Federal Emergency Management Agency designed to demonstrate the capabilities of State and local emergency management agencies to technically assess the extent of the radiological impact from a release, develop Protective Action Recommendations (PAR), implement Protective Action Decisions (PADs), and protect the health, lives, and property of the citizens residing within the 50 mile Emergency Planning Zone.

To demonstrate the ability to communicate between multiple levels of government and provide timely, accurate, and sufficiently detailed information to the public, the emergency management agency's use a variety of resources including radios, telephones, the Internet, the media, the Emergency Alert System (EAS), and the utility Alert and Notification System sirens (ANS). Several of these communications resources were employed and evaluated.

An essential capability of the Radiological Emergency Preparedness Program (REPP) relative to an ingestion exercise is to evaluate Relocation, Re-entry, and Return as necessary, and provide guidance for embargoing food and milk products. Temporary care and shelter to displaced residents from the EPZ and the ability of the support counties to mobilize personnel and resources to establish reception, monitoring and decontamination, and mass care centers was not

demonstrated in this exercise.

## 2.3 Scenario Summary

A serious accidental release of radioactive material occurred at the Limerick Generating Station (LGS) Unit 1 located near Pottstown, PA in Montgomery County early on the morning of Sunday, March 6, 2011. Unit 2 was operating at 100 % power.

Offsite Response Organizations (ORO) responded to the event in accordance with existing plans. Several Protective Action Decisions (PADs) were made during the Plume Exposure Phase of the accident. At 0718 the Governor of the Commonwealth ordered the evacuation of the population residing within the 10 mile Plume Exposure Pathway, Emergency Planning Zone (EPZ) which covers portions of Berks, Chester, and Montgomery Counties.

A release of radioactive material from the nuclear facility began at 0700 and lasted for about 3 hours. The evacuation of the entire Plume Exposure Pathway EPZ in Pennsylvania was completed in about 9 hours, around 1600 hours. The Governor also recommended the ingestion of Potassium Iodide (KI) for thyroid protection for Special Populations, Emergency Workers and the general public as well.

Prior to the release, the Department of Agriculture and the Department of Environmental Protection (DEP)/ Bureau of Radiation Protection (BRP) recommended that dairy animals within the 10 miles EPZ be sheltered, and placed on stored feed and protected water supplies. At 1720 this recommendation was extended to the entire 50 miles Ingestion Exposure Zone EPZ. Additional protective actions that were taken included:

- The closing of the Pennsylvania Turnpike,
- The closing of all food processing facilities in the 50 mile Ingestion Exposure Pathway, and
- Sheltering in place at the State Correctional Institute (SCI) at Graterford.

Travel restrictions on the Pennsylvania Turnpike were lifted with sheltering continuing to be enforced at SCI Graterford with continuous monitoring. The Ingestion Exposure Pathway EPZ included all or part of 14 Pennsylvania Counties as well as portions of States of Maryland, Delaware, and New Jersey.

On Sunday March 6, 2011 at 0724, the Governors of the affected states declared a State of Emergency. DEP/BRP requested preliminary Federal assistance from the US Department of Energy Radiological Assistance Program (RAP) team from the Brookhaven National Laboratory. Assets from the Federal Monitoring and Assessment Center (FRMAC) were also requested. DOE/RAP team began to arrive around 1200 and the FRMAC arrived at 1700 to verify the edge of the footprint and collect samples to determine the isotopic mix of the release. The Federal radiological assessment agencies were based out of the Naval Air Station Joint Reserve Base in Willow Grove Pennsylvania. This also served as the Incident Command Center for DEP/BRP.

The US Department of Energy aerial monitoring aircraft took preliminary radiological reading from ground deposition. The combination of the aerial radiological assessment and environmental sampling was conducted on March 7th and 8th to determine the "Restricted Zone" (RZ). The dose rate at the outer edge of the Restricted Zone was initially 1 mR/hr. The projected dose for the first year was 500 mR. The dose rate at site boundary was initially measured to be several hundred mR/hr.

The counties verified the complete evacuation of the Restricted Zone on March 8, 2011, authorizing temporary access to the Restricted Zone through Controlled Entry Points (CEPs). Emergency Workers, police and firefighters entered the Restricted Zone to perform tasks associated with official duties. Residents of the Restricted Zone were required to re-enter at pre designated CEPs for the purpose of retrieving valuables and attending to their property such as livestock.

Federal and State radiation specialists developed a preliminary monitoring program for the 50 mile Ingestion Exposure Pathway EPZ which included the Plume Exposure Pathway EPZ providing ongoing assessment of changes in conditions, determining potential radiation exposure to the general population assessing contamination levels and changes in milk, water, commodities, and assess the efficacy of cleanup operations.

The Bureau of Radiation Protection and the Maryland Department of the Environmental Protection after evaluating the survey result made Protective Action Recommendations (PARs) to the State Recovery Task Force (SRTF). The State Recovery Task Force further evaluated the Protective Action Recommendations and as appropriate made Ingestion Phase PARs into PADs which govern return, re-entry, relocation.

Zones A, B, and C were designated as the Restricted Zone. Re-entry into the Restricted Zone

---

required all individuals to receive a radiological briefing and be escorted by a Health Physics/Physicist. All entries into the Restricted Zone were expected to utilize the "As Low As Reasonable Achievable" (ALARA) concept which limits the stay time based on established exposure limits. Zones D and E, which were beyond Zone C were contaminated at levels higher than natural background, but can be released for unrestricted use:

Surface drinking water inside zone A was not suitable for consumption. Enclosed and well water was not affected. Milk produced in zones A through D was not suitable for consumption or fresh market. Vegetables grown in zones A through D were also not suitable for consumption. The Bureau of Radiation Protection also recommended closing commercial food processors in zones A through D. Also recommended was the embargoing of meat, honey, game, and other consumables, pending ongoing analysis.

The airborne release potentially contaminated portions of the Schuylkill River. The nearest domestic water intake was from Pickering Creek. Sampling teams were sent to sample the intake and finished water supplies at this location. The evacuated and sheltered in place populations were concerned about returning to their communities, impact on their property and possession, and long and short term health risks due to exposure and ingestion of depleted radioactive material.

---

## SECTION 3: ANALYSIS OF CAPABILITIES

### 3.1 Exercise Evaluation and Results

Contained in this section are the results and findings of the evaluations of all jurisdictions and locations that participated in the March 8th, 9th, and 10th, 2011, Ingestion Exposure Pathway EPZ Radiological Emergency Preparedness (REP) Exercise. The exercise was conducted to demonstrate the ability of State and local government to protect the health and safety of the public in the 50 mile Emergency Planning Zone surrounding the Limerick Generating Station.

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

The Maryland State Emergency Operations Center (EOC) was evaluated in a previous ingestion exercise in October 2009 with the Calvert Cliff Nuclear Generating Station. Their participation in this exercise was not observed or evaluated; therefore the Maryland SEOC criteria appears in this report as "Not Demonstrated".

### 3.2 Summary Results of Exercise Evaluation

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

(D) Deficiency: 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.

(A) Area Requiring Corrective Action (ARCA): an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact

public health and safety.

(P) Plan Issue: an observed or identified inadequacy in the ORO's emergency plan or implementing procedures, rather than in the ORO's performance. Plan Issues are not exercise issues and are required to be corrected through the revision of the appropriate plans or procedures during the next annual plan review and update, submitted for FEMA review, and reported in the State Annual Letter of Certification.

(N) Not Demonstrated: term applied to the status of a REP exercise Evaluation Area Criterion indicating that the ORO, for a justifiable reason, did not demonstrate the Evaluation Area Criterion, as required in the extent-of-play agreement or at the two -year or six-year interval required in the FEMA REP Program Manual.

(M) Met: status of a REP exercise Evaluation Area Criterion indicating that the participating ORO demonstrated all demonstration criteria for the Evaluation Area Criterion to the level required in the extent of-of-play agreement with no Deficiencies or ARCAs assessed in the current exercise and no unresolved prior ARCAs.

**Table 3.1 - Summary of Exercise Evaluation (2 pages)**

		PA EOC	PA JIC	PA AAC SEOC-BRP	PA SLAB	PA SFST A SER	PA SFST B SER	BrCo EOC (I)	BkCo EOC (I)	CaCo EOC (I)	CC EOC (I)	DeCo EOC (I)
DATE: 2011-03-08 SITE: Limerick Generating Station, PA M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated												
<b>Emergency Operations Management</b>												
<b>Mobilization</b>												
<b>Facilities</b>	1a1	M						M	M	M	M	M
<b>Direction and Control</b>	1b1											M
<b>Communications Equipment</b>	1c1	M						M	M	M	M	M
<b>Equip &amp; Supplies to support operations</b>	1d1					M	M					M
<b>Protective Action Decision Making</b>	1e1	M		M	M	M	M	M	M	M	M	M
<b>Emergency Worker Exposure Control</b>	2a1											
<b>Radiological Assessment and PARs</b>	2b1											
<b>Decisions for the Plume Phase -PADs</b>	2b2											
<b>PADs for protection of special populations</b>	2c1											
<b>Rad Assessment and Decision making for the Ingestion Exposure Pathway</b>	2d1	M		M								
<b>Rad Assessment and Decision making concerning Relocation, Reentry, and Return</b>	2e1	M		M								
<b>Protective Action Implementation</b>												
<b>Implementation of emergency worker exposure control</b>	3a1					M	M	M	M	M	M	M
<b>Implementation of KI decision</b>	3b1											
<b>Implementation of protective actions for special populations - EOCs</b>	3c1											
<b>Implementation of protective actions for Schools</b>	3c2											
<b>Implementation of traffic and access control</b>	3d1	M						M			M	
<b>Impediments to evacuation are identified and resolved</b>	3d2											
<b>Implementation of ingestion pathway decisions - availability/use of info</b>	3e1	M						M	M	M	M	M
<b>Materials for Ingestion Pathway PADs are available</b>	3e2	M						M	M	M	M	M
<b>Implementation of relocation, re-entry, and return decisions.</b>	3f1	M						M	M	M	M	M
<b>Field Measurement and Analysis</b>												
<b>Adequate Equipment for Plume Phase Field Measurements</b>	4a1											
<b>Field Teams obtain sufficient information</b>	4a2											
<b>Field Teams Manage Sample Collection Appropriately</b>	4a3											
<b>Post plume phase field measurements and sampling</b>	4b1					M	M					
<b>Laboratory operations</b>	4c1			M								
<b>Emergency Notification and Public Info</b>												
<b>Activation of the prompt alert and notification system</b>	5a1											
<b>Activation of the prompt alert and notification system - Fast Breaker</b>	5a2											
<b>Activation of prompt alert and notification system-Excptn Areas/Bkup RA</b>	5a3											
<b>Emergency information and instructions for the public and the media</b>	5b1		M					M	M	M	M	M
<b>Support Operations/Facilities</b>												
<b>Mon/decon of evacuees and emergency workers, and registration of evacuees</b>	6a1					M	M					
<b>Mon/decon of emergency worker equipment</b>	6b1					M	M					
<b>Temporary care of evacuees</b>	6c1											
<b>Transportation and treatment of contaminated injured individuals</b>	6d1											

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

DATE: 2011-03-08 SITE: Limerick Generating Station, PA M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		LaCo EOC (I)	LeCo EOC (I)	LhCo EOC (I)	MoCo EOC (I)	MC EOC (I)	NhCo EOC (I)	PhCo EOC (I)	ScCo EOC (I)	YCo EOC (I)	MD EOC	CeCo EOC (I)
<b>Emergency Operations Management</b>												
Mobilization	1a1	M	M	M	M	M	M	M	M	M	N	M
Facilities	1b1						M	M				
Direction and Control	1c1	M	M	M	M	M	M	M	M	M	N	M
Communications Equipment	1d1						M	M			N	
Equip & Supplies to support operations	1e1	M	M	M	M	M	M	M	M	M	N	M
<b>Protective Action Decision Making</b>												
Emergency Worker Exposure Control	2a1											
Radiological Assessment and PARs	2b1											
Decisions for the Plume Phase -PADs	2b2											
PADs for protection of special populations	2c1											
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1										N	
Rad Assessment and Decision making concerning Relocation, Reentry, and Return	2e1											
<b>Protective Action Implementation</b>												
Implementation of emergency worker exposure control	3a1	M	M	M	M	M	M	M	M	M		M
Implementation of KI decision	3b1											
Implementation of protective actions for special populations - EOC's	3c1											
Implementation of protective actions for Schools	3c2											
Implementation of traffic and access control	3d1					M					N	
Impediments to evacuation are identified and resolved	3d2											
Implementation of ingestion pathway decisions - availability/use of info	3e1	M	M	M	M	M	M	M	M	M	N	M
Materials for Ingestion Pathway PADs are available	3e2	M	M	M	M	M	M	M	M	M	N	M
Implementation of relocation, re-entry, and return decisions.	3f1	M	M	M	M	M	M	M	M	M	N	M
<b>Field Measurement and Analysis</b>												
Adequate Equipment for Plume Phase Field Measurements	4a1											
Field Teams obtain sufficient information	4a2											
Field Teams Manage Sample Collection Appropriately	4a3											
Post plume phase field measurements and sampling	4b1											
Laboratory operations	4c1											
<b>Emergency Notification and Public Info</b>												
Activation of the prompt alert and notification system	5a1											
Activation of the prompt alert and notification system - Fast Breaker	5a2											
Activation of prompt alert and notification system-Excpin Areas/Bkup RA	5a3											
Emergency information and instructions for the public and the media	5b1	M	M	M	M	M	M	M	M	M		M
<b>Support Operations/Facilities</b>												
Mon/decon of evacuees and emergency workers, and registration of evacuees	6a1											
Mon/decon of emergency worker equipment	6b1											
Temporary care of evacuees	6c1											
Transportation and treatment of contaminated injured individuals	6d1											

---

## 3.3 Criteria Evaluation Summaries

### 3.3.1 Maryland Jurisdictions

#### 3.3.1.1 Maryland Emergency Operations Center

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

### 3.3.2 Risk Jurisdictions

#### 3.3.2.1 Cecil County Emergency Operations Center (I)

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

### 3.3.3 Pennsylvania Jurisdictions

#### 3.3.3.1 Pennsylvania Emergency Operations Center

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

---

### 3.3.3.2 Pennsylvania Joint Information Center

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

### 3.3.3.3 Pennsylvania Accident Assessment Center, State Emergency Operations Center-Bureau of Radiation Protection

- a. MET: 1.e.1, 2.d.1, 2.e.1.
- b. AREAS REQUIRING CORRECTIVE ACTION: 2.d.1.

ISSUE NO.: 35-11-2d1-A-03

**CRITERION:** Radiological consequences for the ingestion pathway are assessed and appropriate protective action decisions are made based on the ORO planning criteria.

**CONDITION:** While briefing the assessment group on Protective Action Recommendations (PAR) from the Pennsylvania Department of Agriculture (PDA), the PDA representative incorrectly stated that the ingestion pathway area with low level radioactive contamination had "no contamination." He should have described the area as having low level radioactive contamination below protective action guidelines, adding information regarding food controls.

**POSSIBLE CAUSE:** During development of ingestion (food product) PARs, the PDA utilized a different radioactive material deposition map than was used during the presentation of PARs to a larger assessment group. Additionally, the PDA presenter had limited experience in formulating and presenting ingestion pathway PARs. It is noted that the PAR documented on the PDA's PAR Record Form correctly identified the area in question as having, "some contamination."

**REFERENCE:** NUREG 0654, J.11

**EFFECT:** PDA assessment personnel could present the incorrect information to

decision makers regarding recommended food controls. If the oversight in characterizing the area with low level contamination were not discovered prior to a decision being made, appropriate information may not be put out to the public regarding controls for ingestion of foodstuffs from areas with low level contamination (but below the FDA PAGs).

**CORRECTIVE ACTION DEMONSTRATED:** The lead exercise controller was consulted and a timeout was called for discussion and retraining. After the PDA reviewed their recommendation and consulted with the Bureau of Radiation Protection (BRP), the information regarding the affected downwind area with low level contamination was correctly presented to the assessment group. The re-demonstration included presentation of amplifying information regarding what to do prior to consuming food products from the area with low level radioactive contamination (e.g. washing fruits, scrubbing vegetables, removal of outer leaves, etc).

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

#### 3.3.3.4 PA State Laboratory

- a. MET: 1.e.1, 4.c.1.
- b. AREAS REQUIRING CORRECTIVE ACTION: 4.c.1.

ISSUE NO.: 35-11-4c1-A-01

**CRITERION:** Laboratory is capable of performing required radiological analyses to support PADs

**CONDITION:** The sample receipt area displayed inadequate contamination control measures at the onset of the laboratory exercise. The staff was attempting to determine if the out packaging of the samples was contaminated by survey with an instrument with a pancake detector. One of the samples was labeled 5.40 mR/hr, due to the level of radiation from this and other samples, determination of packaging

contamination was not possible.

**POSSIBLE CAUSE:** Inadequate training; multiple instructors for staff training with different methods for contamination surveys; improvement needed in sample receipt procedure.

**REFERENCE:** NUREG-0654, C.3; J.11

**EFFECT:** Cross contamination of samples could have occurred requiring extensive decontamination of sample packaging and sample receipt area.

**CORRECTIVE ACTION DEMONSTRATED:** The Evaluator discussed the issue with the controller. The controller stopped the exercise and then provided clear and precise training. The sample receipt staff then monitored the sample exterior packaging correctly by segregating the samples, taking smears on the exterior of the packages and surveying the smear in an area of low background. The exercise then continued without further issues, and this item was re-demonstrated successfully.

c. **DEFICIENCY:** None

d. **PLAN ISSUES:** None

e. **NOT DEMONSTRATED:** None

f. **PRIOR ISSUES - RESOLVED:** None

g. **PRIOR ISSUES - UNRESOLVED:** None

### 3.3.3.5 PA State Field Sampling Team A, South East Region

a. **MET:** 1.d.1, 1.e.1, 3.a.1, 4.b.1, 6.a.1, 6.b.1.

b. **AREAS REQUIRING CORRECTIVE ACTION:** 4.b.1.

**ISSUE NO.:** 35-11-4b1-A-02

**CRITERION:** Field teams demonstrate the capability to make appropriate measurements and to collect appropriate samples (e.g., food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making. (NUREG-0654, I.8., J.11)

**CONDITION:** The field teams did not demonstrate the capability to make

appropriate measurements and to collect appropriate samples (e.g., food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making. Field Sampling Team A failed to monitor radiation exposure levels en route to sampling location and prior to exiting vehicle at the sampling location. Team members performed pre-operational and response checks on all instruments, then returned them to the instrumentation container in the back of the truck (in the "on" configuration). When prodded by the evaluator by a question concerning the background exposure reading, a team member recovered an ADM 300 from the back of the truck, noted the background reading and retained the instrument in the cab.

The instrument was not referenced during the approximate 30 minute ride to the sampling location. The controller's scenario directed an increase from measured background to 200 mR/hr en route. This was not detected by the field sampling team.

There was a radiation survey instrument with an external probe installed in the vehicle. However, it was not operationally checked nor noted en route. It also alarmed several times due to a bad connection.

Upon arrival at the sampling location, Field Sampling Team A exited the vehicle and spent several minutes walking around and preparing to sample. Team members did not identify the increased background radiation level until they were preparing paperwork for the sample.

**POSSIBLE CAUSE:** Unfamiliarity with field monitoring, BRP-ER-A-6.01 and field sampling procedures, BRP-ER-A-8.02

**REFERENCE:** NUREG-0654, II.J.10, BRP Procedure BRP-ER-A-6.01, BRP Procedure BRP-ER-A-8.02

**EFFECT:** Potential contamination and avoidable radiation exposure to field sampling team personnel.

**CORRECTIVE ACTION DEMONSTRATED:** On April 21, 2011 this item was correctly re-demonstrated. Field Team Alpha consisting of a Pennsylvania Department of Environment Protection – Bureau of Radiation Protection and (PA-

---

DEP BRP) and a Pennsylvania Department of Agriculture (PDA) served as sample team members. All staff received a radiological briefing prior to departure. The instrument that was built into the Field Sampling vehicle was not used as the hand held instrumentation was in service at all times. At 0925 on April 21, 2011 the team departed for the sampling location and were told to locate an area with a dose rate of 400 – 500 uR/hr. During transit the team monitored the dose rate meter the entire time. This meter was fed data from the Virtual Plume scenario program. Upon locating an area of 472 uR/hr. The teams simulated donning protective gear, exited the vehicle with the dose rate meter and performed an extensive survey of the area. This satisfied the re-demonstration criteria and the exercise was terminated at 1015 hours. All activities were based on the plan and procedures and completed as they would have been in an actual emergency except as noted in the extent of play agreement.

- c. DEFICIENCY: None
- d. PLAN ISSUES: 3.a.1.

ISSUE NO.: 35-11-3a1-P-01

CRITERION: OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers IAW plans and procedures. Emergency workers periodically and at the end of each mission read and record dosimeter reading. (NUREG-0654, K.3)

CONDITION: The plan does not adequately address the type of dosimetry required for all field sampling team members. One field sampling member per team did not wear a form of permanent record dosimetry. Two field teams (PA State Field Teams A and B) were dispatched during the exercise to collect milk, vegetation, water, and soil samples. The teams were comprised of two Pennsylvania Department of Environmental Protection, (DEP) Bureau of Radiation Protection (BRP) health physicists and one water supply specialist and one agricultural specialist. BRP health physicist wore job issued personal record dosimetry. Other personnel did not wear and were not issued dosimetry other than direct reading dosimeters issued at the beginning of the exercise prior to commencing field activities.

**POSSIBLE CAUSE:** Some field team members were not issued Permanent Record Dosimeters. The procedure addresses the use of dosimetry but does not define the dosimetry requirements to include a Permanent Record Dosimeter.

**REFERENCE:** NUREG-0654, K.3.a,b, BRP-ER-A-8.02

**EFFECT:** No means of permanent exposure record keeping of response personnel.

**CORRECTIVE ACTION DEMONSTRATED:** Procedure BRP-ER-A-8.02 "Environmental Sampling Procedure, was revised April 2011 to require all members of the Field Sampling Teams to have a Permanent Record Dosimeter (PRD). This is contained in Section 1, Item B – Field Team Equipment "Permanent Record Dosimeter (TLD or other PRD as required by FRMAC) if sampling team member does not already have one assigned." and in Section 5 "BRP Field Sampling Procedures" under item 4 – "Note 1: All sampling team members MUST have a PRD".

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

#### **3.3.3.6 PA State Field Sampling Team B, South East Region**

- a. MET: 1.d.1, 1.e.1, 3.a.1, 4.b.1, 6.a.1, 6.b.1.
- b. AREAS REQUIRING CORRECTIVE ACTION: None
- c. DEFICIENCY: None
- d. PLAN ISSUES: 3.a.1.

**ISSUE NO.:** 35-11-3a1-P-02

**CRITERION:** OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers IAW plans and procedures. Emergency workers periodically and at the end of each mission read and record dosimeter reading. (NUREG-0654, K.3)

**CONDITION:** The plan does not adequately address the type of dosimetry required

---

for all field sampling team members. One field sampling member per team did not wear a form of permanent record dosimetry. Two field teams (PA State Field Teams A and B) were dispatched during the exercise to collect milk, vegetation, water, and soil samples. The teams were comprised of two Pennsylvania Department of Environmental Protection (DEP) Bureau of Radiation Protection (BRP) health physicists and one water supply specialist and one agricultural specialist. BRP health physicist wore job issued personal record dosimetry. Other personnel did not wear and were not issued dosimetry other than direct reading dosimeters issued at the beginning of the exercise prior to commencing field activities.

POSSIBLE CAUSE: Some field team members were not issued Permanent Record Dosimeters. The procedure addresses the use of dosimetry but does not define the dosimetry requirements to include a Permanent Record Dosimeter.

REFERENCE: NUREG-0654, K.3.a,b, BRP-ER-A-8.02

EFFECT: No means of permanent exposure record keeping of response personnel

CORRECTIVE ACTION DEMONSTRATED: Procedure BRP-ER-A-8.02 "Environmental Sampling Procedure, was revised April 2011 to require all members of the Field Sampling Teams to have a Permanent Record Dosimeter (PRD). This is contained in Section 1, Item B – Field Team Equipment "Permanent Record Dosimeter (TLD or other PRD as required by FRMAC) if sampling team member does not already have one assigned." and in Section 5 "BRP Field Sampling Procedures" under item 4 – "Note 1: All sampling team members MUST have a PRD".

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

---

### 3.3.4 Risk Jurisdictions

#### 3.3.4.1 Berks County Emergency Operations Center (I)

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

#### 3.3.4.2 Bucks County Emergency Operations Center (I)

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

#### 3.3.4.3 Carbon County Emergency Operations Center (I)

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

#### 3.3.4.4 Chester County Emergency Operations Center (I)

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

---

f. PRIOR ISSUES - RESOLVED: 3.e.1.

ISSUE NO.: 46-98-3e1-A-02

ISSUE: Chester County officials did not simulate contacting the Chester Water Authority to close off, or coordinate the closing of, county's water intake (#123004), which is in the Susquehanna River in Lancaster County near the PBAPS. This surface water intake was located in Zone A (i.e., the Restricted Zone defined by the Commonwealth of Pennsylvania).

CORRECTIVE ACTION DEMONSTRATED: Chester County EOC successfully redemonstrated this criterion during an IPX Table Top Exercise on March 9, 2011. Per exercise message number 02-29 (water intakes), the Chester County EOC successfully re-demonstrated the availability and appropriate use of adequate information concerning water intakes within the ingestion exposure pathway planning zone for implementation of protective actions (3.e.1).

The EOC coordinated with the local water supplier for the PA Department of Environmental Protection to close the affected water intake, which was required per the ingestion exercise. The County Public Information Officer developed a press release to disseminate information to the public once the EOC verified with Aqua PA the the intake was closed. The EOC also interfaced with its adjacent counties, Philadelphia County and Delaware County, concerning the impact on the availability of drinking water. These activities were demonstrated through interview.

g. PRIOR ISSUES - UNRESOLVED: None

**3.3.4.5 Delaware County Emergency Operations Center (E)**

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

---

### 3.3.4.6 Lancaster County Emergency Operations Center (I)

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

ISSUE NO.: 46-98-5b1-A-03

ISSUE: The press release did not describe the procedures according to the Lancaster County plans, Appendix 16, Annex E.VI.C, 19, a.5., for the return of evacuees. Also, it failed to identify known landmarks and geographical boundaries or to identify protective action measures for milk and other food products.

CORRECTIVE ACTION DEMONSTRATED: During the Limerick Generating Station (LGS) tabletop exercise conducted on March 9, 2011, Lancaster County issued Press Release #2 that included information regarding the geographical boundaries (roads) that defined the borders within Lancaster County where food products were being controlled. This press release also included protective measures for milk, livestock, agricultural products and other foods in the impacted area.

Press release #2 did not describe procedures for the return of evacuees. Lancaster County is outside of the 10-mile plume Emergency Planning Zone and did not have any evacuated areas; therefore, there were no returning evacuees to provide information for. Pennsylvania Emergency Management Agency PR-1 provided information for return of evacuees outside of the restricted zone. This press release stated that evacuated individuals who do not live in the restricted zone were permitted to return to their homes or businesses and resume normal indoor or outdoor activities. Additionally, the current Lancaster Radiological Emergency Response Procedure, dated April 2010, addresses information for return of evacuees, but it is intended for use when Lancaster County responds as a risk county to an incident at Three Mile Island or Peach Bottom Nuclear Generating Station. The Lancaster County Emergency Management Coordinator indicated that he would provide information to returning evacuees when responding to an event at Peach Bottom or

---

Three Mile Island, but was not applicable for Limerick Generating Station.

g. PRIOR ISSUES - UNRESOLVED: None

**3.3.4.7 Lebanon County Emergency Operations Center (I)**

a. MET: 1.a.1, 1.c.1, 1.e.1, 3.a.1, 3.e.1, 3.e.2, 3.f.1, 5.b.1.

b. AREAS REQUIRING CORRECTIVE ACTION: None

c. DEFICIENCY: None

d. PLAN ISSUES: None

e. NOT DEMONSTRATED: None

f. PRIOR ISSUES - RESOLVED: None

g. PRIOR ISSUES - UNRESOLVED: None

**3.3.4.8 Lehigh County Emergency Operations Center (I)**

a. MET: 1.a.1, 1.c.1, 1.e.1, 3.a.1, 3.e.1, 3.e.2, 3.f.1, 5.b.1.

b. AREAS REQUIRING CORRECTIVE ACTION: None

c. DEFICIENCY: None

d. PLAN ISSUES: None

e. NOT DEMONSTRATED: None

f. PRIOR ISSUES - RESOLVED: None

g. PRIOR ISSUES - UNRESOLVED: None

**3.3.4.9 Monroe County Emergency Operations Center (I)**

a. MET: 1.a.1, 1.c.1, 1.e.1, 3.a.1, 3.e.1, 3.e.2, 3.f.1, 5.b.1.

b. AREAS REQUIRING CORRECTIVE ACTION: None

c. DEFICIENCY: None

d. PLAN ISSUES: None

e. NOT DEMONSTRATED: None

f. PRIOR ISSUES - RESOLVED: None

g. PRIOR ISSUES - UNRESOLVED: None

---

**3.3.4.10 Montgomery County Emergency Operations Center (I)**

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

**3.3.4.11 Northampton County Emergency Operations Center (I)**

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

**3.3.4.12 Philadelphia City/County Emergency Operations Center (I)**

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

**3.3.4.13 Schuylkill County Emergency Operations Center (I)**

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

---

#### 3.3.4.14 York County Emergency Operations Center (I)

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

ISSUE NO.: 46-98-5b1-A-04

ISSUE: The lead-in scenario for the Ingestion Pathway Exercise, Day 2, indicated that milk and agricultural products within the “footprint” in Area E were unsuitable for consumption. However, the media map advisory, which was prepared and released by York County, stated that “Print D represents the area in which agricultural products, including milk and crops, are unsuitable for consumption or market sale.”

CORRECTIVE ACTION DEMONSTRATED: During the Limerick Generating Station Ingestion Tabletop Exercise conducted on March 9, 2011, York County responded to a message inject Protective Action Decision (PAD) for fresh fluid milk samples collected from Areas A through D, which were determined to be in excess of Protective Action Guidelines (PAGs). After discussion between the York County Coordinator, Bureau of Radiation Protection, and Department of Agriculture, the York County staff identified the appropriate dairy producers and explained the procedures for notification. The York County Public Information Officer prepared and released Press Release #1 prohibiting dairy farmers in the effected municipalities of Peach Bottom Township, Lower Chanceford Township, and Chanceford Township from shipping milk. Additional information relayed within the press release included information from the Pennsylvania Department of Agriculture advising milk products not be consumed, milk currently stored at farms in the effected municipalities must be dumped into manure storage or a depression such as a swimming pool, old trench, or silo to prevent run-off, and included the halting of food and milk processing within these jurisdictions.

---

**g. PRIOR ISSUES - UNRESOLVED: None**

## **SECTION 4: CONCLUSION**

The Commonwealth of Pennsylvania, State of Maryland, and local jurisdictions except where noted in this report, demonstrated knowledge of their Radiological Emergency Response Plans (RERP) and procedures during the Limerick Generating Station, Ingestion Exposure Pathway Exercise and adequately implemented them.

The Limerick Generating Station 2011 Ingestion Exposure Pathway exercise evaluation included fifteen (15) Counties, Bureau of laboratories, two (2) Field Monitoring teams, and more than forty (40) State Agencies. Twenty five (25) Federal Emergency Management Agency (FEMA) evaluators provided analyses of 156 evaluation criteria. These analyses resulted in a determination of three(3) Areas Requiring Corrective Action (ARCA) of which all were successfully re-demonstrated. In addition, two (2) new Planning Issues were assessed and resolved. There were 3 ARCAs from the previous 1998 Peach Bottom Atomic Power Station (PBAPS) Ingestion Exposure Pathway exercise were also successfully re-demonstrated and resolved.

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

---

## APPENDIX A: EXERCISE TIMELINE

A table indicating the times associated with key events and activities is not part of this Ingestion, Exposure Pathway exercise. A chronology of events and activities are part of the scenario which contained the Injects and Master Scenario Events List (MSEL).

---

## **APPENDIX B: EXERCISE EVALUATORS AND TEAM LEADERS**

The following is the list of Evaluators and Team Leaders for the Limerick Generating Station 2011 Post Plume Ingestion Exercise evaluated on March 8, 9, and 10 and 6, 2011. The following constitutes the managing staff for the Exercise Evaluation:

- Darrell Hammons, DHS, Radiological Assistance Committee Chairman
- Michael E. Shuler, Sr., DHS, Exercise Evaluation Program Manager and Site Specialist
- John Price, DHS, Team Leader, County Day
- Martin Vyenielo, DHS, Team Leader, Technical Assessment, Field Sampling, Laboratory
- Richard Kinard, DHS, Team Leader, State Recovery Task Force

Also, the following personnel evaluated locations as representatives of the Radiological Assistance Committee:

- James Ostaszewski, US Department of Transportation, Federal Aviation Administration
- Marcos Aquino, US Environmental Protection Agency
- Roger Kowieski, ICF Consulting

Additional evaluation assistance was provided by the following Radiological Emergency Preparedness Program personnel:

Miriam Weston, DHS/ Federal Emergency Management Agency, Region II  
Nan Calhoun, DHS/ Federal Emergency Management Agency, Region VI  
Brian Hasemann, DHS/ Federal Emergency Management Agency, HQ  
Linda Gee, DHS/ Federal Emergency Management Agency, Region VI  
Steve Marshall, DHS/ Federal Emergency Management Agency, HQ  
John Arszulowicz, DHS/ Federal Emergency Management Agency, HQ  
Ken Wierman, DHS/ Federal Emergency Management Agency, HQ  
Lisa Hamilton, DHS/ Federal Emergency Management Agency, HQ  
David Jeremy, DHS/ Federal Emergency Management Agency, HQ  
Kaori Flores, DHS/ Federal Emergency Management Agency, HQ  
Harry Nash, DHS/ Federal Emergency Management Agency, HQ  
LaShawn Halsey, DHS/ Federal Emergency Management Agency, HQ  
Michael Howe, DHS/ Federal Emergency Management Agency, HQ

Unclassified  
Radiological Emergency Preparedness Program (REP)

After Action Report/Improvement Plan

Limerick Generating Station

**DATE: 2011-03-08, SITE: Limerick Generating Station, PA**

LOCATION	EVALUATOR	AGENCY
Pennsylvania Emergency Operations Center	Barton Freeman Richard Kinard Tina Lai Thomas Robert Neff Joseph Suders	FEMA RIII FEMA RIII FEMA RIII FEMA RIII FEMA RIII
Pennsylvania Joint Information Center	Robert Neff	FEMA RIII
Pennsylvania Accident Assessment Center, State Emergency Operations Center-Bureau of Radiation Protection	Marcy Campbell Tina Lai Thomas Daniel Lerch	ICF FEMA RIII FEMA RIII
PA State Laboratory	Robert Neff *Martin Vyenielo	FEMA RIII FEMA RIII
PA State Field Sampling Team A, South East Region	Michael Howe	FEMA HQ
PA State Field Sampling Team B, South East Region	Marcos Aquino	EPA RIII
Maryland Emergency Operations Center	Administrative Evaluator	
Berks County Emergency Operations Center (I)	James Ostaszewski	DOT/FAA
Bucks County Emergency Operations Center (I)	Nan Calhoun	FEMA RVI
Carbon County Emergency Operations Center (I)	Lisa Hamilton	FEMA HQ
Chester County Emergency Operations Center (I)	Daniel Lerch	FEMA RIII
Delaware County Emergency Operations Center (I)	Barton Freeman Michael Shuler	FEMA RIII FEMA RIII
Lancaster County Emergency Operations Center (I)	Marcy Campbell	ICF
Lebanon County Emergency Operations Center (I)	Kaori Flores	FEMA HQ
Lehigh County Emergency Operations Center (I)	Steve Marshall	FEMA HQ
Monroe County Emergency Operations Center (I)	Brian Hasemann	FEMA RII
Montgomery County Emergency Operations Center (I)	Miriam Weston	FEMA RII
Northampton County Emergency Operations Center (I)	John Arszulowicz *Michael Shuler	FEMA HQ FEMA RIII
Philadelphia City/County Emergency Operations Center (I)	Michael Shuler Kenneth Wierman	FEMA RIII FEMA HQ
Schuylkill County Emergency Operations Center (I)	Linda Gee	FEMA RVI
York County Emergency Operations Center (I)	Joseph Suders	FEMA RIII
Cecil County Emergency Operations Center (I)	David Jeremy	FEMA HQ
* Team Leader		

## APPENDIX C: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
ACP	Access Control Points
AEA	Agricultural Extension Agent
ANI	American Nuclear Insurers
AO	Agriculture Officer
ARCA	Area Requiring Corrective Action
CAD	Computer Aided Dispatcher
CCEOC	Cecil County Emergency Operations Center
CEB	County Emergency Board
CEO	Chief Executive Officer
CEP	Controlled Entry Point
CES	Cooperative Extension Service
DIL	Derived Intervention Level
DRD	Direct Reading Dosimeter
EAS	Emergency Alerting System
ECL	Emergency Classification Level
EMA	Emergency Management Agency
EMC	Emergency Management Coordinator
EMD	Emergency Management Director
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
EPLO	Emergency Preparedness Liaison Officer
EPZ	Emergency Protection Zone
EW	Emergency Workers
FAA	Federal Aviation Authority
FCC	Fire Communications Center
FEMA	Federal Emergency Management Agency
FHA	Farmers Home Administration
GIS	Geographical Information System
HP	Health Physicist
HS	Human Services
ICS	Incident Command System
IPE	Ingestion Pathway Exercise

IPZ	Ingestion Pathway Zone
JIC	Joint Information Center
LEMA	Lebanon Emergency Management Agency
LGS	Limerick Generating Station
MCEMA	Monroe County Emergency Management Agency
MDE	Maryland Department Environment
MEMA	Maryland Emergency Management Agency
MPS	Municipal Planner Specialist
MSEL	Master Scenario Events List
NRC	Nuclear Regulatory Commission
NWS	National Weather Service
OSL	Optically Stimulated Luminescence
PAD	Protective Action Decision
PAG	Protective Action Guidelines
PAM	Preferential Assessment Map
PAR	Protective Action Recommendation
PBAPS	Peach Bottom Atomic Power Station
PEMA	Pennsylvania Emergency Management Agency
PEMARS	Pennsylvania Emergency Management Agency Radio System
PF	Protection Factor
PIO	Public Information Officer
PR	Press Releases
PRD	Permanent Record Dosimeters
PSAP	Public Safety Answer Point
PSP	Pennsylvania State Police
REP	Radiological Emergency Plan
RERP	Radiological Emergency Response Plan
RO	Radiological Officer
RSAN	Roam Secure Alert Notification
RSO	Radiation Safety Officer
SCS	Soil Conservation Service
SEOC	State Emergency Operations Center
SEVAN	State Emergency Voice Activation Network
SRTF	State Recovery Task Force
TCP	Traffic Control Points
UPS	Uninterruptable Power Supply
VTC	Video Teleconference Conference

---

## APPENDIX D: EXERCISE PLAN

The enclosed Exercise Plan was created as an overall tool for facilitation and implementation of the Limerick Generating Station 2011 Post Plume Ingestion Exercise and to integrate the concepts and policies of the Homeland Security Exercise Evaluation Program with the Radiological Emergency Preparedness Program Exercise Methodology.

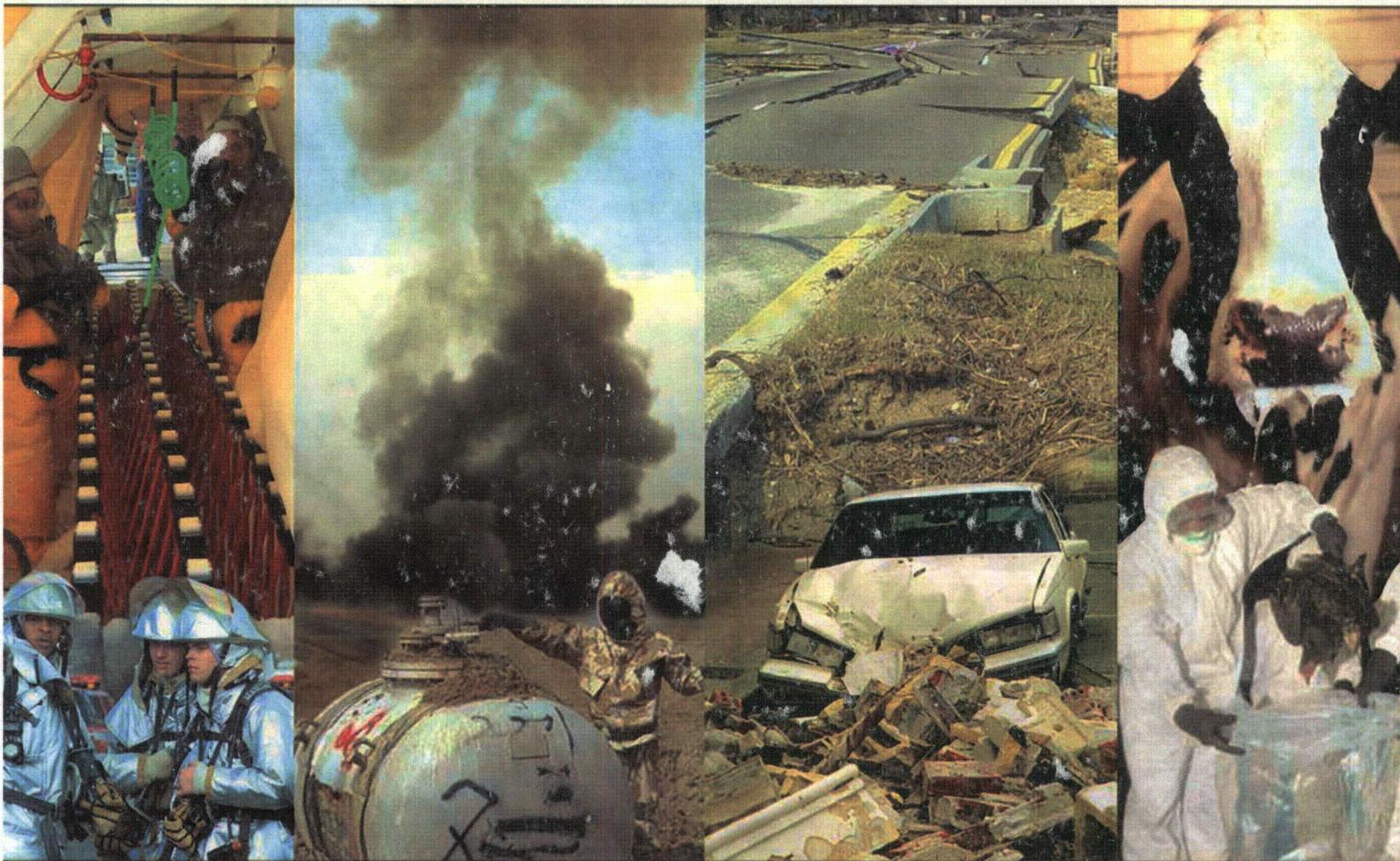
The Exercise Plan was originally drafted and published by the Pennsylvania Emergency Agency (PEMA) as an independent document and is annexed here. The Limerick Generating Station Extent of Play was negotiated and agreed upon by FEMA Region III, Pennsylvania Emergency Management Agency (PEMA), and the office of emergency management of the Risk and Support Counties. It is included as an Appendix of the Exercise Plan.

NATIONAL EXERCISE PROGRAM

# Exercise Plan

[2011 LIMERICK GENERATING STATION]  
FEMA EVALUATED REP EXERCISE

U.S. DEPARTMENT OF HOMELAND SECURITY



Exercise Date: 3/8-10/2011



FEMA

## Preface

The 2011 Limerick Generating Station Post Plume Ingestion Exercise Evaluated Functional Exercise (FE) is sponsored by the Federal Emergency Management Agency (FEMA) and the Pennsylvania Emergency Management Agency (PEMA). This Exercise Plan (ExPlan) was produced with input, advice, and assistance from the Exercise Planning Team (EPT), which followed the guidance set forth in the Federal Emergency Management Agency, Homeland Security Exercise and Evaluation Program (HSEEP).

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

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

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

---

## HANDLING INSTRUCTIONS

1. The title of this document is the *2011 Limerick Generating Station Ingestion Exercise Plan (ExPlan)*.
2. The information gathered in this ExPlan is *For Official Use Only (FOUO)* and should be handled as sensitive information not to be disclosed. This document should be safeguarded, handled, transmitted, and stored in accordance with appropriate security directives. Reproduction of this document, in whole or in part, without prior approval from the Exercise Planning Director is prohibited.
3. At a minimum, the attached materials will be disseminated only on a need-to-know basis and when unattended, will be stored in a locked container or area offering sufficient protection against theft, compromise, inadvertent access, and unauthorized disclosure.
4. For more information, please consult the following points of contact (POCs):

Federal POC(s):

Michael Shuler, Sr.  
Technological Hazards Program Specialist  
Federal Emergency Management Agency  
615 Chestnut Street  
Philadelphia, Pa 19106-4404  
215-931-5526  
[michael.shuler@dhs.gov](mailto:michael.shuler@dhs.gov)

PEMA POC(s):

Jesse Wells  
Emergency Management Specialist  
Pennsylvania Emergency Management Agency  
2605 Interstate Drive  
Harrisburg, Pa. 17110  
717-651-2190  
[jewells@state.pa.us](mailto:jewells@state.pa.us)

PEMA POC(s):

Alan Brinser  
Emergency Management Specialist  
Pennsylvania Emergency Management Agency  
2605 Interstate Drive  
Harrisburg, Pa. 17110  
717-651-2217  
[abrinser@state.pa.us](mailto:abrinser@state.pa.us)

MEMA POC

Fred Frey

Agency Planner

Maryland Emergency Management Agency

5401 Rue Saint Lo Drive

Reisterstown, MD 21136

410-517-3613

[ffrey@mema.state.md.us](mailto:ffrey@mema.state.md.us)

Cecil County POC

Steve Flickinger

Emergency Planner

Cecil County Department of Public Safety

107 Chesapeake Boulevard, Suite 108

Elkton, Maryland 21921

410-392-2037

[steve.flickinger@ccdps.org](mailto:steve.flickinger@ccdps.org)

---

## TABLE OF CONTENTS

<b>1. Exercise Plan .....</b>	<b>48</b>
<b>2. LIMERICK GENERATING STATION FEMA EVALUATED REP EXERCISE .....</b>	<b>48</b>
<b>3. U.S. DEPARTMENT OF HOMELAND SECURITY .....</b>	<b>48</b>
<b>4. Preface .....</b>	<b>49</b>
<b>5. Handling Instructions .....</b>	<b>50</b>
<b>6. General Information .....</b>	<b>54</b>
Introduction .....	54
Confidentiality .....	54
Purpose .....	54
Target Capabilities .....	55
Exercise Objectives .....	55
Outstanding Issues .....	56
<b>7. Chapter 2: Exercise Logistics .....</b>	<b>57</b>
Exercise Summary .....	57
General.....	57
Assumptions.....	57
Exercise Participants.....	58
Exercise Tools .....	59
Controller and Evaluator Handbook .....	59
Master Scenario Events List .....	59
Exercise Implementation.....	60
Exercise Play.....	60
Exercise Rules.....	60
Safety Requirements .....	60
General.....	60
Exercise Setup.....	61
Accident Reporting and Real Emergencies .....	61
Site Access.....	62
Security .....	62
Observer Coordination.....	62
Parking and Directions.....	62
Restroom Facilities .....	62
Exercise Identification .....	62
Communications Plan .....	62
Exercise Start, Suspension, and Termination Instructions.....	62
Player Communication.....	63

---

Player Briefing .....	63
Public Affairs .....	63
<b>8. Chapter 3: Player Guidelines .....</b>	<b>64</b>
Exercise Staff .....	64
Exercise Director .....	64
Trusted Agents .....	64
Lead Controller .....	64
Controllers.....	64
Lead Evaluator .....	65
Evaluators .....	65
Player Instructions .....	65
Before the Exercise .....	65
During the Exercise.....	65
Following the Exercise .....	66
Simulation Guidelines .....	66
<b>9. Chapter 4: Evaluation and Post-Exercise Activities .....</b>	<b>67</b>
Exercise Documentation .....	67
Exercise Evaluation Guides .....	67
Debriefing .....	67
After Action Report.....	67
After Action Conference and Improvement Plan .....	67
After Action Conference.....	68
Improvement Plan.....	68
<b>10. Appendix A: Exercise Schedule .....</b>	<b>69</b>
<b>11. Appendix B: Extent of Play Information.....</b>	<b>70</b>

---

## CHAPTER 1: GENERAL INFORMATION

### Introduction

The 2011 Limerick Generating Station Post Plume Ingestion Exercise is a functional exercise (FE) designed to establish a learning environment for players to exercise emergency response plans, policies, and procedures as they pertain to Nuclear Power Plant accidents. A FE is a complex event that requires detailed planning. To conduct an effective exercise, subject matter experts (SMEs) and local representatives from numerous agencies have taken part in the planning process and will take part in exercise conduct and evaluation.

This Exercise Plan (ExPlan) was produced at the direction of the Federal Emergency Management Agency and the Pennsylvania Emergency Management Agency with the input, advice, and assistance of the Exercise Planning Team. The 2011 Limerick Generating Station Ingestion Exercise is evidence of the growing partnership between State and local jurisdictions for response to the threats our Nation and communities face.

### Confidentiality

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

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

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

### Purpose

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

The objective of the Federal Emergency Management Agency and the Pennsylvania Emergency Management Agency is to demonstrate reasonable assurance that the public can be protected during a nuclear power plant emergency.

---

## Target Capabilities

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

The capabilities listed below have been selected by the Exercise Planning Team (EPT) from the priority capabilities identified in Pennsylvania Multi-Year TEP and the FEMA Interim Radiological Emergency Preparedness Program Manual (August 2002), Exercise Evaluation Criteria. These capabilities provide the foundation for development of the exercise objectives and scenario, as the purpose of this exercise is to measure and validate performance of these capabilities and their associated critical tasks.

- Communications
- Emergency Operations Center Management
- Responder Safety and Health
- Public Safety and Security Response
- WMD/HazMat Response and Decontamination
- Citizen Evacuation and Shelter-In-Place
- Emergency Public Information and Warning
- Mass Care (Sheltering, Feeding, and Related Services)

## Exercise Objectives

The Emergency Preparedness Evaluation Areas – the elements and sub-elements – for this exercise are those that are required to be demonstrated in every ingestion (post plume) exercise, as required by 67 FR 20580 (April 25, 2002) and the *Interim REP Program Manual (August 2002)*. Appendix B Extent of Play shows the emergency preparedness elements that are required to be demonstrated in the 2011 Limerick Generating Station Ingestion Exercise, along with the level of demonstration that will be displayed in the exercise (i.e., fully demonstrated, limited demonstration, simulated, out-of-sequence interviews, not demonstrated).

The objective of this exercise is to demonstrate reasonable assurance that the health and safety of the public can be protected, through successful demonstration of tasks identified in Appendix B.

## Outstanding Issues

There are three "Areas Requiring Corrective Action" (ARCAs) that must be addressed as a result of the FEMA-evaluated ingestion-phase exercise at Peach Bottom Atomic Power Station in 1998.

ARCA issue numbers:

Ref. No.	OLD NUMBER	FACILITY EVALUATED	NEW CRITERIA
1	46-98-27-A-02	Chester Co. EOC – Ingestion Exercise	3.e.1
2	46-98-29-A-03	Lancaster Co. EOC – Ingestion Exercise	5.b.1
3	46-98-27-A-04	York Co. EOC – Ingestion Exercise	5.b.1

---

## CHAPTER 2: EXERCISE LOGISTICS

### Exercise Summary

#### General

The 2011 Limerick Generating Station Ingestion Exercise is designed to establish a learning environment for players to exercise their plans and procedures for responding to an incident at a nuclear power plant. The 2011 Limerick Generating Station Ingestion Exercise will be conducted on March 8, 9, & 10, 2011. The exercise schedule will be as follows:

March 08 – Technical Assessment Staff Functional Exercise

March 09 – County Functional Exercise

March 10 – State Recovery Task Force Functional Exercise

Exercise play on each day is scheduled from 0800 to 1500 hours. The exercise may conclude when the Lead Controller in consultation with FEMA determines that the exercise objectives have been met.

#### Assumptions

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

- The exercise will be evaluated against the REPP criteria. Elements outside the scope of the REP criteria will not be evaluated.
- This exercise will be conducted in a no-fault learning environment wherein systems and processes, not individuals, will be evaluated.
- Exercise simulation will be realistic and plausible, containing sufficient detail from which to respond.
- Exercise players will react to the information and situations as they are presented. They will make decisions and represent actions that they would take in a real event.
- Exercise rules of engagement will include guidelines for exercise play within the constructs and constraints of the exercise environment.

#### Constructs and Constraints

Constructs are exercise devices designed to enhance or improve exercise realism. Alternatively, constraints are exercise limitations that may detract from exercise realism. Constraints may be the inadvertent result of a faulty construct or may pertain to financial and staffing issues.

Although there are a number of constructs and constraints (also known as exercise artificialities) for any exercise, the Exercise Planning Team recognizes and accepts the following as necessary:

- Players will utilize communication methods designed specifically for this exercise.
- A variety of injects will be used during this exercise. Controllers may utilize written exercise messages, video recordings, audio recordings, and simulated phone calls to drive the exercise.
- Certain simulations are allowed.

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

### Exercise Participants

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

- *Players.* Players are agency personnel who have an active role in responding to the simulated emergency and perform their regular roles and responsibilities during the exercise. Players initiate actions that will respond to and mitigate the simulated emergency.
- *Controllers.* Controllers set up and operate the exercise site; plan and manage exercise play; act in the roles of response individuals and agencies not playing in the exercise. Controllers direct the pace of exercise play and routinely include members from the exercise planning team. They provide key data to players and may prompt or initiate certain player actions to ensure exercise continuity.
- *Simulators.* Simulators are control staff personnel who role-play as nonparticipating organizations or individuals. They most often operate out of the Simulation Cell (SimCell), but may occasionally have face-to-face contact with players. Simulators function semi-independently under the supervision of the Lead Controller, enacting roles (e.g., as media reporters or next of kin) in accordance with instructions provided in the Master Scenario Events List (MSEL). All simulators are ultimately accountable to the Lead Controller. For this exercise, the SimCell will be restricted to the Rumor Control Function.
- *Evaluators.* Evaluators are chosen to evaluate and provide feedback on a designated functional area of the exercise. They are chosen based on their expertise in the functional area(s) they have been assigned to review during the exercise and their familiarity with local emergency response procedures. Evaluators assess and document players' performance against established emergency plans and exercise evaluation criteria, in accordance with HSEEP standards and within the bounds of REP Program guidance and regulations. They are typically chosen from amongst planning committee members or the agencies/organizations that are participating in the exercise. FEMA evaluators are members of the FEMA Headquarters, Regions II, III, and VI REP Program staff.

---

representatives of the Radiological Assistance Committee, and contractors. FEMA Evaluators will not serve as Controllers.

- *Actors.* Actors are exercise participants who act or simulate specific roles during exercise play. They are typically volunteers who have been recruited to play the role of victims or other bystanders.
- *Observers.* Observers visit or view selected segments of the exercise. Observers do not play in the exercise, and do not perform any control or evaluation functions. Observers will view the exercise from a designated observation area and will be asked to remain within the observation area during the exercise. PEMA observers will be present at selected locations as assigned by the Lead Controller. PEMA observers will receive an observer briefing prior to the day of the exercise. Any V.I.P.s or other visitors will be handled by each agency or location (Municipal EOC, County EOC, etc.) according to that agency's policies and procedures.
- *Media Personnel.* Some media personnel may be present as observers pending approval by the Exercise Director in coordination with the PEMA Press Office. Media interaction may also be simulated by Actors at the Joint Information Center during the simulated press briefing to enhance realism and meet related exercise objectives.
- *Support Staff.* Exercise support staff includes individuals who are assigned administrative and logistical support tasks during the exercise (i.e. registration, catering, etc).

## Exercise Tools

### Controller and Evaluator Handbooks

The 2011 Limerick Generating Station Ingestion Exercise Controller and Evaluator Handbooks are designed to help exercise Controllers and Evaluators conduct and evaluate an effective exercise. These Handbooks also enable Controllers and Evaluators to understand their roles and responsibilities in exercise execution and evaluation. Should a Player, Observer, or media representative find an unattended Handbook, it should be provided to the nearest Controller or Evaluator.

### Master Scenario Events List

The Master Scenario Events List (MSEL) outlines benchmarks, as well as injects that drive exercise play. It also details realistic input to the exercise players as well as information expected to emanate from simulated organizations (i.e., those nonparticipating organizations, agencies, and individuals who would usually respond to the situation). An inject will include several items of information, such as inject time, intended recipient, responsible controller, inject type, a short description of the event, and the expected player action.

For the 2011 Limerick Generating Station Ingestion Exercise the MSEL will be used for primary exercise play. Most of the exercise will be conducted in large meeting rooms utilizing injects and demonstrating decision making information gathering, coordination among agencies, and critical

thinking. There will be some field play involving Bureau of Radiation Protection (BRP) and Pa. Department of Environmental Protection (PaDEP) field teams who will be taking samples of soil, water, milk, etc. and the PaDEP Laboratory.

## Exercise Implementation

### Exercise Play

Exercise play will begin at approximately 0900 hours with a lead in scenario that will provide a framework for exercise play. Play will proceed according to the events outlined in the MSEL, in accordance with established plans and procedures. The exercise will conclude upon the completion of operations and attainment of the exercise objectives, as determined by the Lead Controller after consultation with FEMA.

### Exercise Rules

The following are the general rules that govern exercise play:

- Real-world emergency actions take priority over exercise actions.
- Exercise participants will comply with real-world response procedures, unless otherwise directed by control staff.
- All field communications (written, radio, telephone, etc.) made during the exercise will begin and end with the phrase, "This is a drill."
- Communications during the discussion based portion of the exercise will be a combination of written responses and telephone conversations on designated lines.

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

## Safety Requirements

### General

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

- An exercise Safety Controller will be identified and be responsible for participant safety.
- All exercise controllers, evaluators, and staff will serve as safety observers while the exercise activities are underway. Any safety concerns must be immediately reported to the Safety Controller.

- Participants will be responsible for their own and each other's safety during the exercise. It is the responsibility of all persons associated with the exercise to stop play if, in their opinion, a real safety problem exists. Once the problem is corrected, exercise play can be restarted.
- All organizations will comply with their respective environmental, health, and safety plans and procedures, as well as the appropriate Federal, State, and local environmental health and safety regulations.

### **Exercise Setup**

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

### **Accident Reporting and Real Emergencies**

- Anyone observing a participant who is seriously ill or injured will provide aid within their training, call the County 911 Center for additional aid or enlist the aid of another person to call, and advise the nearest controller. Anyone calling County 911 will use the phrase "this is not a drill" prior to explaining the injury or illness.
- The controller who is made aware of a real emergency will contact the County 911 center (if this call has not already been made) and request the appropriate aid. The controller will use the phrase "this is not a drill" prior to explaining the injury or illness.
- The controller will then contact the Lead Controller and Exercise Director with the following information:
  - Venue/function
  - Location within the venue/function
  - Condition of injured parties
  - Requirements for medical aid, fire suppression, rescue, or security resources.
- If the nature of the emergency requires a suspension of the exercise at the venue/function, all exercise activities at that facility will immediately cease. Exercise play may resume at that venue/function once the emergency situation has been addressed.
- Exercise play at other venue/functions should not cease if one venue/function has declared a "Real-World Emergency" unless they are reliant on the affected venue.
- If a real emergency occurs that affects the entire exercise, the exercise may be suspended or terminated at the discretion of the Exercise Director and Lead Controller. The notification will be made from the State Emergency Operations Center. The Lead Controller will notify the SimCell by phone.

## **Site Access**

### **Security**

Exercise play for the 2011 Limerick Generating Station Ingestion Exercise will be conducted at numerous sites with varying degrees of security requirements. The Limerick Generating Station will control entry to the Utility and the Emergency Operations Facility. Security at State, County, and Municipal Emergency Operations Centers will be conducted according to their individual security procedures. Individual Site Controllers will be in charge of entry into their respective exercise sites. To prevent confusion and interruption of the exercise, access to the exercise sites and the SimCell will be limited to exercise participants and approved Observers only. Players should advise their venue's controller or evaluator if an unauthorized person is present. Each organization should follow its internal security procedures, augmented as necessary to comply with exercise requirements.

### **Observer Coordination**

Each organization with observers will coordinate with the Exercise Director for access to the exercise site. Names of observers must be submitted 30 days prior to the exercise. PEMA Observers are exercise participants (not players) and will be assigned by the Lead Controller. Non-Participant Observers (V.I.P.s, visitors, etc.) will be escorted to an observation area for orientation and conduct of the exercise. All non-participant observers will be asked to remain within the designated observation area during the exercise. The Site Controller will be present to explain the exercise program and answer questions for the observers during the exercise.

### **Parking and Directions**

Directions to each venue area are available from the Lead Controller. Parking will be controlled according to existing policy at each individual location.

### **Restroom Facilities**

Restroom facilities will be available at each venue.

### **Exercise Identification**

Exercise participants will display their existing organizational identification badges.

## **Communications Plan**

### **Exercise Start, Suspension, and Termination Instructions**

The exercises on March 8, 9, & 10, 2011 are scheduled to run for 0800 to 1500 hours or until the Lead Controller after consultation with FEMA and the Utility determine that the exercise objectives have been met. The Lead Controller will announce the exercise suspension or termination through the State Emergency Operations Center.

**All spoken and written communication will start and end with the statement, "THIS IS A DRILL."**

### **Player Communication**

Players will use routine, in-place agency communication systems. Additional communication assets may be made available as the exercise progresses. All exercise communication over primary dispatch channels will cease immediately if a real world emergency is announced. Communications concerning a real world emergency will be preceded by the phrase "This is not drill". In no instance will exercise communication interfere with real-world emergency communications. Exercise communication over these channels will recommence when authorized by the Exercise Director after he is advised by County 911 that it is safe to do so. Each venue will coordinate its own internal communication networks and channels.

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

### **Player Briefing**

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

### **Public Affairs**

Joint Information Centers will be established at both the Utility Emergency Operations Facility and the State Emergency Operations Center. Actors will play the role of reporters and (simulated **not publicly broadcast**) "public briefings" will be given as they would for a real incident. The briefings will be available for viewing at the County EOCs.

Any participation by the actual media will be coordinated through the Exercise Director in conjunction with the PEMA Public Information Office.

---

## CHAPTER 3: PLAYER GUIDELINES

### Exercise Staff

#### Exercise Director

The Exercise Director has the overall responsibility for planning, coordinating, and overseeing all exercise functions. The Exercise Director for the 2011 Limerick Generating Station Ingestion Exercise is the Radiological Emergency Preparedness Regional Assistance Committee Chair. The Exercise Director has delegated the following responsibilities to other team members:

The FEMA Region III Site Specialist for the Limerick Generating Station has authority to make determinations concerning evaluation issues and re-demonstrations, and,

The PEMA Planner for the Limerick Generating Station has responsibility to organize and lead the Exercise Planning Team.

#### Trusted Agents

Trusted agents are exercise planners and participants who are responsible for developing the Scenario and the Master Scenario Events List (MSEL). These documents are restricted and are not available to the rest of the Exercise Planning Team, Players, or other Participants. The trusted agents for the 2011 Limerick Generating Station Ingestion Exercise include the Exercise Director, Lead Controller, Bureau of Radiation Protection (BRP) Representative, and the FEMA Technological Hazards Program Specialist.

#### Lead Controller

The Lead Controller also functions as a Trusted Agent. As such he is involved in developing the Master Scenario Events List and is privy to the scenario used at the Utility to generate exercise play. The Lead Controller is responsible for scheduling controllers at the "Out of Sequence" components of the exercise and the 2011 Limerick Generating Electric Station Ingestion Exercise. The Lead Controller monitors exercise progress and coordinates decisions regarding deviations or significant changes to the scenario caused by unexpected developments during play. The Lead Controller monitors actions by individual Controllers and ensures they implement all designated and modified actions at the appropriate time. The Lead Controller will be the PEMA REP Training Program Manager.

#### Controllers

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

Trusted Agent from the Utility will act as the Controller at the Utility Site during the Plume exercise and the BRP Trusted Agent will act as Controller for the BRP Field Teams.

### **Lead Evaluator**

The Lead Evaluator is responsible for the overall evaluation of the 2011 Limerick Generating Station Ingestion Exercise. The Lead Evaluator monitors exercise progress and stays in contact with the Lead Controller regarding changes to the exercise during play. The Lead Evaluator monitors actions of individual Evaluators and ensures they are tracking progress of the players in accordance with the Overview of Play. The Lead Evaluator debriefs the evaluators after the exercise and oversees the entire evaluation and After Action process. The Lead Evaluator will be the FEMA Region III REP Site Specialist.

### **Evaluators**

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

### **Player instructions**

#### **Before the Exercise**

- Review the appropriate emergency plans, procedures, and exercise support documents.
- Arrive at the exercise location as instructed. Wear appropriate uniform/identification badge.
- If you gain knowledge of the scenario before the exercise, notify a controller so that appropriate actions can be taken to ensure a valid evaluation.
- Read your Player Information Handout, which includes information on exercise safety.
- Please sign in.
- Bureau of Radiation Protection Field Monitoring Teams will be briefed by the BRP Field Team Coordinator.

#### **During the Exercise**

- Respond to the exercise events and information as if the emergency were real, unless otherwise directed by an exercise controller.
- Controllers will only give you information they are specifically directed to disseminate. You are expected to obtain other necessary information through existing emergency information channels.

- 
- Do not engage in personal conversations with controllers, evaluators, observers, or media personnel while the exercise is in progress. If you are asked an exercise-related question, give a short, concise answer. If you are busy and cannot immediately respond, indicate so, but report back with an answer at the earliest time possible.
  - If you do not understand the scope of the exercise or if you are uncertain about an organization's or agency's participation in an exercise, ask a controller.
  - Parts of the scenario may seem implausible. Recognize that the exercise has objectives to satisfy and may require the incorporation of unrealistic aspects. Note that every effort has been made by the trusted agents to balance realism with safety and the creation of an effective learning and evaluation environment.
  - All exercise communication will begin and end with the phrase "This is a drill". This is a precaution taken so anyone overhearing the conversation will not mistake the exercise play for a real-world emergency.
  - When communicating with the SimCell, identify the organization, agency, office, and/or individual with which you want to speak.
  - Verbalize out loud when taking an action. This will ensure that evaluators are made aware of critical actions as they occur.
  - Maintain a log of your activities. Many times, this log may include documentation of activities missed by a controller or evaluator.

### **Following the Exercise**

- At the end of the exercise at your facility, participate in a debriefing with the controllers and evaluators.
- Provide all rosters, sign in sheets, logs, messages, notes or materials generated from the exercise to your controller or evaluator for review and inclusion in the AAR.
- Bureau of Radiation Protection Field Monitoring Teams will be debriefed immediately following the exercise by the BRP Coordinator.

### **Simulation Guidelines**

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

If a real emergency occurs during the exercise, the exercise at your respective venue may be suspended or terminated at the discretion of the controller(s) at each venue. If a real emergency occurs, provide assistance up to the level of your training, call 911 and use the phrase "This is not drill" and ask for the appropriate assistance, and notify the nearest Controller and Evaluator.

## CHAPTER 4: EVALUATION AND POST-EXERCISE ACTIVITIES

### Exercise Documentation

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

### Exercise Evaluation Guides

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

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

### Debriefing

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

### After Action Report

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

### After Action Conference and Improvement Plan

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

## After Action Conference

The After Action Conference (AAC), scheduled for April 18, 2011 at 1000 hours, is a forum for jurisdiction officials to hear the results of the evaluation analysis, validate the findings and recommendations in the draft AAR, and begin development of the IP. The After Action Conference can be conducted via a conference call.

## Improvement Plan

The IP identifies how recommendations will be addressed, including what actions will be taken, who is responsible, and the timeline for completion. It is created by key stakeholders from the 2011 Limerick Generating Station Ingestion Exercise participating agency officials during the AAC scheduled for April 18, 2011.

## APPENDIX A: EXERCISE SCHEDULE

**Table A.1 Limerick Generating Station Ingestion Exercise Schedule**

Date	Personnel	Activity
<b>March 8, 2011</b>		
08:00 – 16:00	Commonwealth of Pennsylvania	Technical Assessment
	State Agencies (See Section 1)	
<b>March 9, 2011</b>		
08:00 – 16:00	Berks County	County Day
	Bucks County	County Day
	Carbon County	County Day
	Chester County	County Day
	Delaware County	County Day
	Lancaster County	County Day
	Lebanon County	County Day
	Lehigh County	County Day
	Monroe County	County Day
	Montgomery County	County Day
	Northampton County	County Day
	Philadelphia County	County Day
	Schuylkill County	County Day
	York County	County Day
	Cecil County, Maryland	County Day
<b>March 10, 2011</b>		
08:00 – 16:00	Commonwealth of Pennsylvania	State Recovery Task Force
	State Agencies (See Section 1)	

## APPENDIX B: EXTENT OF PLAY INFORMATION

The Extent of Play for each participating agency are included here as an Annex to the ExPlan. Each Annex includes Site Maps to the various venues.

### COMMONWEALTH OF PENNSYLVANIA

#### METHOD OF OPERATION

##### 1. Limerick Generating Station (LGS)

LGS personnel provided assistance to the Exercise Planning Team with scenario development and logistics support. LGS personnel will participate during scheduled activities to support the exercise. A pre-approved exercise scenario will be used.

##### 2. Bureau of Radiation Protection (BRP)

Personnel from the Pennsylvania Bureau of Radiation Protection (BRP) will be present and participate in the following aspects of the exercise as follows:

- March 8, 2011 - Technical Day
- March 9, 2011 – Environmental Sampling Day
- March 9, 2011 - Laboratory Evaluation

BRP personnel will be evaluated as participants.

##### 3. Pennsylvania Emergency Management Agency (PEMA)

This “Method of Operation” includes activities for the Post Plume Ingestion Exercise demonstration during the week of March 7, 2011. Criterion information for Full-Scale Plume Exercise (November 15, 2011) will not be referenced as part of this Extent of Play. This document will only reference the criteria related to the Post Plume Ingestion Exercise.

###### A. Post Plume (Ingestion) Exercise – Week of March 7, 2011:

- March 8, 2011 – Technical Day
- March 9, 2011 – County Day and Environmental Sample Collection/Lab evaluation
- March 10, 2011- State Recovery Task Force (SRTF)

###### B. Full Scale Plume Exercise – Week of November 14, 2011

[RESERVED]

#### 4. Counties Designated to Participate

##### Post Plume Ingestion Exercise – Week of March 7, 2011:

Fourteen (14) counties will participate in the Post Plume Ingestion Exercise. Nine of the fourteen counties have participated in prior Plume Exercises associated with Limerick Generating Station, Three Mile Island or the Susquehanna Steam Electric Station. Therefore, nine counties have participated in a baseline evaluation (expressed in Criteria 1.b, 1.d, and 1.e) for Facilities, Communications Equipment, and Equipment and Supplies to Support Operations. Additionally, the five counties of Carbon, Delaware, Monroe, Northampton, and Philadelphia are non-traditional Radiological Exercise Program (REP) counties. All but Delaware and Philadelphia were evaluated for their “baseline” capabilities during the 2004 SSES Post Plume Exercise. Northampton County Emergency Operations Center (EOC) is now located in a new facility and will therefore be required to undergo the additional baseline evaluation criteria at their new location. Delaware, Northampton and Philadelphia counties shall be evaluated as outline in Attachment A.

All fourteen (14) counties (Berks, Bucks, Carbon, Chester, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, Schuylkill, and York) within the fifty mile Ingestion Exposure Pathway Emergency Planning Zone will participate in the Post-Plume Ingestion Exercise “Tabletop” on March 9, 2011 at the Exelon Emergency Operations Facility in Coatesville, PA.

#### 5. PEMA Liaison Officers

PEMA Liaison Officers shall be available to assist counties as players in support of the County Day Exercise on March 9, 2011 in Coatesville. PEMA Liaisons may assist counties as they are generally dispatched to various County EOCs during disasters.

#### 6. Controllers

SERO BRP Controllers (non-players) will accompany the environmental sampling teams on March 9, 2011. Controllers may provide information to the players at appropriate times based upon the scenario and the actions of the field sampling teams.

#### 7. PEMA Observers

PEMA staff, qualified county emergency management personnel, and/or nuclear power plant personnel will be assigned, if required, for the purpose of observing, noting response actions and conditions, and recording observations for future use. Observers will not take an active part in the proceedings, but will interact with staff members to the extent necessary to fulfill their observer responsibilities. Coaching of players by observers is not permitted except to provide training to participants awaiting a re-demonstration.

## 8. FEMA Evaluators

Federal Evaluators will make visits to Delaware, Northampton and Philadelphia Counties as outline in Attachment A to conduct "baseline" capabilities. Federal evaluators will also be present at PEMA Headquarters March 8, 2011, for the purpose of evaluating the Bureau of Radiation Protection personnel during the "Technical Assessment" activities.

Federal Evaluators will be present for the "County Table-Top exercise" to be conducted on March 9, 2011 at the Exelon Emergency Operations Facility in Coatesville, PA. Additionally, Federal Evaluators will accompany the environmental sampling teams on March 9, 2011 during the collection of water, milk, vegetation and soil samples and evaluators will be at the Pennsylvania DEP State Laboratory on March 9, 2011.

Federal Evaluators will be present for the State Recovery Task Force activities (March 10, 2011) at PEMA Headquarters, Harrisburg, PA.

Locations and details are provided in Attachment A.

## 9. Demonstration Windows

The "demonstration windows" are those periods of time designated in the exercise during which specified demonstrations will be accomplished out of sequence. The purpose of the windows is to provide for more effective demonstrations as well as permitting the release of volunteers from the exercise play at a reasonable hour.

- Post Plume Ingestion Exercise technical data assimilation and evaluation (Bureau of Radiation Protection) will occur Tuesday March 8, 2011 during normal business hours (0800-1600 hrs.) at PEMA Headquarters.
- Non-Baselined counties will be evaluated [TBD] during normal business hours (0800-1600 hrs.).
- The post-plume (ingestion) County tabletop exercise will be conducted March 9, 2011 between 0830 and 1500 at the Exelon Emergency Operations Facility (EOF) in Coatesville, PA.
- Sample collection of milk, vegetation, water, and soil will be conducted / demonstrated March 9, 2011 at locations specified within Attachment A. Sampling teams will meet their evaluators at a predetermined location, receive a briefing and deploy to the sampling locations.
- Laboratory demonstration will be conducted on March 9, 2011 at the Bureau of Labs, 2575 Interstate Drive in Harrisburg PA.
- The State Recovery Task Force will be evaluated at PEMA Headquarters between 0800 and 1600 hrs. on March 10, 2011.

## 10. General Concepts

An emergency plan is drafted to address the generally expected conditions of an emergency. Not everything in the emergency plan may be applicable for a given scenario. The main purpose of an emergency plan is to assemble sufficient expertise and officials so as to properly react to the events as they occur. The responders should not be so tied to a plan that they cannot take actions that are more protective of the public. Furthermore, if, by following the plan there is a failure to protect the public health and safety, it should be noted so that the plan can be modified and the appropriate negative assessment applied.

---

**COMMONWEALTH OF PENNSYLVANIA  
EXTENT OF PLAY AGREEMENT**

**EVALUATION AREA 1 – EMERGENCY OPERATIONS MANAGEMENT**

**Sub-element 1.a – Mobilization**

**INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) should have the capability to alert, notify, and mobilize emergency personnel and to activate and staff emergency facilities.

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

**EXTENT OF PLAY**

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

All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

**PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated to the extent of verifying OROs staff participating is in accordance with their respective plans and procedures.*

**Sub-element 1.b – Facilities**

**INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have facilities to support the emergency response.

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

**EXTENT OF PLAY**

Facilities will only be specifically evaluated for this criterion if they are new or have substantial changes in structure or mission. Responsible OROs should demonstrate the availability of facilities that support the accomplishment of emergency operations. Some of the areas to be considered are: adequate space, furnishings, lighting, restrooms, ventilation, backup power and/or alternate facility (if required to support operations.)

Facilities must be set up based on the ORO's plans and procedures and demonstrated as they would be used in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

**PEMA NEGOTIATED EXTENT OF PLAY:**

*The three counties, namely Delaware, Northampton and Philadelphia, were evaluated by means of a site visit and interview. Availability of backup power may be evidenced by physical inspection, interview and / or maintenance records.*

**Sub-element 1.c - Direction and Control**

**INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have the capability to control their overall response to an emergency.

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

**EXTENT OF PLAY**

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

All activities associated with direction and control must be performed based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless otherwise noted above or indicated in the extent of play agreement.

---

## PEMA NEGOTIATED EXTENT OF PLAY

*This criterion will be demonstrated during the SRTF and County demonstration dates and by personnel involved with activities related to sampling and analysis.*

### Sub-element 1.d – Communications Equipment

#### INTENT

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

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

#### EXTENT OF PLAY

OROs will demonstrate that a primary and at least one backup system are fully functional at the beginning of an exercise. If a communications system or systems are not functional, but exercise performance is not affected, no exercise issue will be assessed. Communications equipment and procedures for facilities and field units should be used as needed for the transmission and receipt of exercise messages. All facilities and field teams should have the capability to access at least one communication system that is independent of the commercial telephone system. Responsible OROs should demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt the conduct of emergency operations. OROs should ensure that a coordinated communication link for fixed and mobile medical support facilities exists. The specific communications capabilities of OROs should be commensurate with that specified in the response plan and/or procedures. Exercise scenarios could require the failure of a communications system and the use of an alternate system, as negotiated in the extent of play agreement.

All activities associated with the management of communications capabilities must be demonstrated based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless otherwise noted above or in the extent of play agreement.

## PEMA NEGOTIATED EXTENT OF PLAY

*The three baseline counties identified in section 5.A of the Method of Operations shall conduct a FEMA observed communications pathway test between the County and the State Emergency Operations Center— Harrisburg, PA. At least two pathways will be demonstrated / tested. One pathway test will be conducted via the State Emergency Voice Alerting Network (SEVAN). The second test may be conducted by a method selected by the County such as standard commercial telephone.*

*Field Sampling Teams will be evaluated for this criterion.*

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

#### INTENT

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have emergency equipment and supplies adequate to support the emergency response.

**Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operations. (NUREG-0654, H.7,10; J.10.a, b, e, J.11; K.3.a)**

#### EXTENT OF PLAY

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

All instruments, including air sampling flow meters (field teams only), should be inspected, inventoried, and operationally checked before each use. Instruments should be calibrated in accordance with the manufacturer's recommendations. Unmodified CDV-700 series instruments and other instruments without a manufacturer's recommendation should be calibrated annually. Modified CDV-700 instruments should be calibrated in accordance with the recommendation of the modification manufacturer. A label indicating such calibration should be on each instrument, or the calibration frequency may be verified by other means. Additionally, instruments being used to measure activity should have a range of reading sticker affixed to the side of the instrument. The above considerations should be included in 4.a.1 for field team equipment; 4.c.1 for radiological laboratory equipment (does not apply to analytical equipment; reception center and emergency worker facilities' equipment under 6.a.1; and ambulance and medical facilities' equipment under 6.d.1.

Sufficient quantities of appropriate direct-reading and permanent record dosimeters and dosimeter chargers should be available for issuance to all categories of emergency workers that

could be deployed from that facility. Appropriate direct-reading dosimetry should allow individual(s) to read the administrative reporting limits and maximum exposure limits contained in the ORO's plans and procedures.

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

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

Quantities of dosimetry and KI available and storage location(s) will be confirmed by physical inspection at storage location(s) or through documentation of current inventory submitted during the exercise, provided in the Annual Letter of Certification submission, and/or verified during a Staff Assistance Visit. Available supplies of KI should be within the expiration date indicated on KI bottles or blister packs. As an alternative, the ORO may produce a letter from a certified private or State laboratory indicating that the KI supply remains potent, in accordance with U.S. Pharmacopoeia standards.

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **PEMA NEGOTIATED EXTENT OF PLAY.**

*The three counties, namely Delaware, Northampton and Philadelphia, were evaluated by means of a site visit and interview. These are non-traditional REP counties and therefore have limited access to dosimetry equipment, KI, etc.*

*This criteria will be evaluated at each days location , Technical Assessment Day, Field Sampling, Laboratory, County Day and SRTF day to verify the maps, equipment that is necessary for understanding the impact of the deposition can be understood and thereby the protective actions recommended and implemented.*

---

## EVALUATION AREA 2 – PROTECTIVE ACTION DECISION-MAKING

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

#### INTENT

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

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

#### PEMA NEGOTIATED EXTENT OF PLAY

*This criterion will be demonstrated during the technical assessment phase and referred to the SRTF for decision making purposes and implementation as appropriate. The information will be presented to the Counties for implementation as appropriate.*

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

Relocation: OROs should demonstrate the capability to estimate integrated dose in contaminated areas and to compare these estimates with PAGs, apply decision criteria for relocation of those individuals in the general public who have not been evacuated but where projected doses are in excess of relocation PAGs, and control access to evacuated and restricted areas. Decisions are made for relocating members of the evacuated public who lived in areas that now have residual radiation levels in excess of the PAGs.

Determination of areas to be restricted should be based on factors such as the mix of radio nuclides in deposited materials, calculated exposure rates vs. the PAGs, and field samples of vegetation and soil analyses.

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

Examples of control procedures are: the assignment of, or checking for, direct-reading and non-direct-reading dosimetry for emergency workers; questions regarding the individual's objectives and locations expected to be visited and associated time frames; availability of maps and plots of

radiation exposure rates; advice on areas to avoid; and procedures for exit including: monitoring of individuals, vehicles, and equipment; decision criteria regarding decontamination; and proper disposition of emergency worker dosimetry and maintenance of emergency worker radiation exposure records.

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

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

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

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion will be demonstrated during the technical assessment phase and referred to the SRTF for decision making purposes and implementation as appropriate. The information will be presented to the counties for implementation as appropriate.*

*The first session on March 8, 2011 at 0830 will be held at PEMA Headquarters, Harrisburg, PA – Room 230. On this day, the radiological assessment and protective action recommendations will be demonstrated. Participation in this first session will be limited to the technical staff which includes the BRP Accident Assessment staff, DEP Water Supply, PEMA staff, Pennsylvania Department of Agriculture staff, and Federal technical support (USDA, NRC, EPA) who are participating. All communications with other locations will be simulated by a controller. The following summarizes each day's activities:*

## EXERCISE DAY 1 – March 8, 2011, 8:30 a.m.

*This portion of the exercise will be conducted in a role-play format. The time period is simulated to begin approximately 27 hours after a fictitious release from a nuclear power plant accident at the Limerick Generating Station (LGS). An initial message is given to players stating: plant is in a stable condition; all releases above technical specifications have been terminated; plant conditions; emergency phase plume pathway protective actions have been implemented; emergency phase ingestion pathway protective actions have been implemented; weather and meteorological conditions; plume phase field sampling results; FRMAC Advance Team and Advisory Group has arrived at the State EOC; a DOE Aerial Measuring System flyover has been requested by the State and the results are provided; sample teams are activated, etc.*

*After the initial briefing, the players will be split into functional groups:*

*BRP: BRP will develop a strategy to identify and refine the plume deposition footprint, and identify Restricted Zones. Data on the deposition and mix of the deposition from analysis of soil and vegetation will be provided to BRP to aid in identification of the plume deposition footprint and Restricted Zone locations. Once the BRP technical staff has completed work on this area, summary tables and a map will be provided to BRP players indicating the plume deposition footprint and the Restricted Zone locations. The Restricted Zone will be the area for which re-entry requirements must be established. This is also the basis for determining individuals that must be re-located and those that may return to their homes.*

*PDA/USDA: PDA/USDA staff will be given a map of the plume deposition footprint. They will then work to identify the agricultural commodities impacted.*

*DEP: DEP Water Supply staff will be given a map of the plume deposition footprint. They will then work to identify the water supplies impacted.*

*Once BRP has identified the plume deposition footprint and Restricted Zones, PDA/USDA has identified the agricultural commodities impacted, and DEP Water Supply has identified the water supplies impacted, the three groups will reassemble. BRP will then consult with PDA/USDA to develop an agricultural product initial monitoring plan, and with DEP Water Supply to develop a water initial monitoring plan.*

*Once the initial agricultural and water monitoring plan have been developed, sample analysis results will be provided by a controller. Two sample results each of milk, vegetation, and water will be provided to ensure that BRP can evaluate the data and determine which samples exceed the Protective Action Guides (PAGs). At this point, summary tables and a map will be provided to the players which indicate where the PAGs are exceeded for the remaining areas. The technical staff playing in this portion of the exercise should then develop Protective Action*

*Recommendations (PARs) for presentation to the State Recovery Task Force. This will conclude the activities for this session.*

<b>Time</b>	<b>Agency</b>	<b>Activity</b>
8:30-9:30 a.m.	ALL	Introduction and briefing. Presentation of the initial conditions and data.
9:30-11:00 a.m.	BRP	Identification of plume deposition footprint and Restricted Zone locations. Identify Re-entry requirements. Identify areas where citizens must be relocated and areas that were previously evacuated that are acceptable for their return
	PDA/USDA and DEP Water Supply	Identification of agricultural commodities impacted and water supplies impacted by plume deposition.
11:00-12:30 p.m.	ALL	Work on Agricultural Initial Monitoring Plan and Water Initial Monitoring Plan.
12:30-1:15 p.m.		Lunch
1:15-2:00 p.m.		BRP: Analysis of data from Agricultural and Water samples to determine if they exceed PAGs.
2:00-3:30 p.m.	ALL	Development of PARs

---

## EVALUATION AREA 3 – PROTECTIVE ACTION IMPLEMENTATION

### Sub-element 3.a – Implementation of Emergency Worker Exposure Control

#### INTENT

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

**Criterion 3.a.1: The OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers in accordance with the plans and procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.a,b)**

#### EXTENT OF PLAY

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

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

During a plume phase exercise, emergency workers should demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. The emergency worker should report accumulated exposures during the exercise as indicated in the plans and procedures. OROs should demonstrate the actions described in the plan and/or procedures by determining whether to replace the worker, to authorize the worker to incur additional exposures or to take other actions. If scenario events do not require emergency workers to seek authorizations for additional exposure, evaluators should interview at least two emergency workers, to determine their knowledge of whom to contact in the event authorization is needed and at what exposure levels. Emergency workers may use any available resources (for example, written procedures and/or co-workers) in providing responses.

Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and adequate control of exposure can be effected for all members of the team by one dosimeter worn by the team leader. Emergency workers who are assigned to low exposure rate areas, for example, at reception centers, counting laboratories, emergency operations centers, and communications centers, may have individual direct-reading dosimeters or they may be monitored by dosimeters strategically placed in the work area. It should be noted that, even in these situations, each team member must still have their own permanent record dosimetry. Individuals without specific radiological response missions, such as farmers for animal care, essential utility service personnel, or other members of the public who must re-enter an evacuated area following or during the plume passage, should be limited to the lowest radiological exposure commensurate with completing their missions.

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated for Field Sampling Teams to insure allowable exposure limits are in accordance with plans and procedures. Counties will demonstrate their understanding of set exposure limits, controls and ability to convey this information to radiation workers in support of recovery activities.*

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

##### **INTENT**

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

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

##### **EXTENT OF PLAY**

OROs should demonstrate the capability to select, establish, and staff appropriate traffic and access control points, consistent with protective action decisions (for example, evacuating, sheltering, and relocation), in a timely manner. OROs should demonstrate the capability to provide instructions to traffic and access control staff on actions to take when modifications in

protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled.

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

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

All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated via interview for those OROs engaged in determining or manning Access Control Points to the Restricted Area.*

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

#### **INTENT**

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

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

#### **EXTENT OF PLAY**

Applicable ORO's should demonstrate the capability to secure and utilize current information on the locations of dairy farms, meat and poultry producers, fisheries, fruit growers, vegetable growers, grain producers, food processing plants, and water supply intake points to implement protective actions within the ingestion pathway EPZ. ORO's should use Federal resources as identified in the FRERP, and other resources (e.g., compacts, nuclear insurers, etc.), if available. Evaluation of this criteria will take into consideration the level of Federal and other resources participating in the exercise.

---

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion will be demonstrated during County and SRTF dates. Note: Agricultural information may be limited based on the level of play from the U.S. Department of Agricultural.*

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

### **EXTENT OF PLAY**

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

### **PEMA NEGOTIATED EXTENT OF PLAY:**

*Data Development and Assessment will be demonstrated by Commonwealth Agencies only. Implementation will be demonstrated by Counties and the SRTF. Federal participation will be simulated.*

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

#### **INTENT**

This sub-element is derived from NUREG-0654, which provides that Offsite Response Organizations (ORO) should demonstrate the capability to implement plans, procedures, and

---

decisions for relocation, re-entry, and return. Implementation of these decisions is essential for the protection of the public from the direct long-term exposure to deposited radioactive materials from a severe accident at a commercial nuclear power plant.

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

#### **EXTENT OF PLAY**

Relocation: OROs should demonstrate the capability to coordinate and implement decisions concerning relocation of individuals, not previously evacuated, to an area where radiological contamination will not expose the general public to doses that exceed the relocation PAGs. OROs should also demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas that have residual radiation levels above the PAGs. Areas of consideration should include the capability to communicate with OROs regarding timing of actions, notification of the population of the procedures for relocation, and the notification of, and advice for, evacuated individuals who will be converted to relocation status in situations where they will not be able to return to their homes due to high levels of contamination.

ORO's should also demonstrate the capability to communicate instructions to the public regarding relocation decisions. ORO's should also demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas that have residual radiation levels above the (first -, second -, and fifty-year) PAG's.

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

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

Return: OROs should demonstrate the capability to implement policies concerning return of members of the public to areas that were evacuated during the plume phase. OROs should demonstrate the capability to identify and prioritize services and facilities that require restoration within a few days, and to identify the procedures and resources for their restoration. Examples

---

of these services and facilities are medical and social services, utilities, roads, schools, and intermediate term housing for relocated persons.

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

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*This sub-element will be evaluated during the post-plume ingestion exercise scheduled for the week of March 7, 2011. Counties (as appropriate) will demonstrate, via table top, their activities during the Wednesday, March 9, 2011 "Table-Top" exercise. The SRTF will demonstrate their activities on Thursday, March 10, 2011.*

---

## **EVALUATION AREA 4 – FIELD MEASUREMENT AND ANALYSIS**

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

#### **INTENT**

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

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

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

#### **EXTENT OF PLAY**

The ORO's field team should demonstrate the capability to take measurements and samples, at such times and locations as directed, to enable an adequate assessment of the ingestion pathway and to support re-entry, relocation, and return decisions. When resources are available, the use of aerial surveys and in-situ gamma measurement is appropriate. All methodology, including contamination control, instrumentation, preparation of samples, and a chain-of-custody form for transfer to a laboratory, will be in accordance with the ORO's plan and/or procedures.

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

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*Players, controllers, and evaluators will assemble at the Penn State Cooperative Extension Office, 601 West Town Road, Suite 370, West Chester, PA. at 9:30 a.m. on Wednesday, March 9,*

2011. A controller will simulate communications from the State EOC to the BRP Regional Program Manager, directing the dispatch of teams to various sample locations in areas which received deposition from the airborne plume and which are outside areas designated as Restricted Zones. Two sample teams will demonstrate and be evaluated. Sample locations will be chosen independent of the plume footprint to allow advance scheduling with farms and water suppliers. BRP Implementing Procedures will be followed. All communications between the sample teams and other locations (such as the State EOC, Regional Office, County EOCs and FRMAC) will be simulated with the controller.

The two teams will be briefed at the assembly area, and the controller will provide the teams with the specific sample requirements and location information that would typically be provided by the County EOC or FRMAC. Travel to the County EOC or FRMAC will be simulated.

One team will be designated an agricultural product field sampling team, and be composed of BRP health physics staff, DEP ER staff and PDA staff. After departing the assembly area they will travel to a pre-designated farm to collect a sample of each of the following: milk and leafy vegetation. Upon completion of the sampling, the team will monitor themselves for contamination, complete appropriate documentation, leave the farm and simulate transporting the vehicles to the laboratory for analyses. The sample team will not be required to don any anti-contamination clothing, except gloves, unless the farmer specifies other protection for the purpose of bio hazard control measures (e.g. booties).

The second team will be designated a water field sampling team, and be composed of BRP health physics staff, DEP ER Staff and DEP water program staff. After departing the Penn State Cooperative Extension Office, 601 West Town Road, Suite 370, West Chester, PA. office. They will travel to the pre-designated water sampling location and collect a sample of each of the following: public water supply water (finished water), and surface water. After obtaining the water samples, the team will collect a soil sample at a pre-designated location. Upon completion of the sampling, the team will monitor themselves for contamination, complete appropriate documentation, leave the farm and simulate transporting the vehicles to the laboratory for analyses. The sample team will not be required to don any anti-contamination clothing, except gloves. All play will be independent with other locations.

#### **Sub-element 4.c - Laboratory Operations**

##### **INTENT**

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

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

## EXTENT OF PLAY

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

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

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

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

## PEMA NEGOTIATED EXTENT OF PLAY

*Players, controllers and evaluators will meet at the Pa. Bureau of Labs at 0900 on March 9, 2011. The Bureau of Labs is located at 2575 Interstate Drive in Harrisburg, PA. DEP/BRP will prepare samples to be analyzed by the laboratory in advance. Samples will consist of: public water supply water (finished water), and surface water, milk, soil and vegetation. Sample labeling will be consistent with samples that would have been collected by environmental sampling teams in the field (e.g. G.P.S. location where sample was obtained, collector I.D., sample number, dose rate, etc.). Personnel from the BRP Environmental Monitoring Section will transport the samples to the Lab at the beginning of the exercise evaluation and complete applicable Chain of Custody transfer documentation when the samples are delivered. The Lab will receive the samples, complete Chain of Custody documentation and process the samples in accordance with their plans and procedures. After analyzing samples, the Lab should preserve /*

---

*dispose of samples in accordance with their plans and procedures. Sample results should be made available to decision makers in order to assist them with the Protective Action Recommendation process.*

*The laboratory evaluation will be conducted in parallel with the DEP field sampling team evaluation on March 9<sup>th</sup>, 2011. Personnel from the PA DEP / BRP Decommissioning and Environmental Surveillance Section will be provided with pre labeled water, vegetation, milk and soil samples in advance of the commencement of the evaluation. These samples will be simulated to have been received from the DEP field sampling teams. The milk sample dose rate will exceed 5 mR/hr at 1 inch. All other samples will be less than 1 mR/hr at 1 inch. PA DEP / BRP Decommissioning and Environmental Surveillance Section will demonstrate transferring Chain of Custody to the Bureau of Labs. After acceptance of the samples, Bureau of Labs personnel will demonstrate performance of sample analysis in accordance with their procedures. The lab personnel will also demonstrate procedures for handling samples that have dose rates that exceed acceptable limits for on-site analysis. Sample count times can be truncated (5 minute count for solids and 3 minute count for liquids) in accordance with BRP-ER-A-6B*

*Time consuming preparation processes that are required prior to counting samples (e.g. the freezing and thawing of vegetation over several days) will be simulated.*

## **EVALUATION AREA 5 – EMERGENCY NOTIFICATION AND PUBLIC INFORMATION**

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

#### **INTENT**

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

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

#### **EXTENT OF PLAY**

Subsequent emergency information and instructions should be provided to the public and the media in a timely manner (will not be subject to specific time requirements). For exercise purposes, timely is defined as “the responsible ORO personnel/representatives demonstrate

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

The ORO should ensure that emergency information and instructions are consistent with protective action decisions made by appropriate officials. The emergency information should contain all necessary and applicable instructions (for example, evacuation instructions, evacuation routes, reception center locations, what to take when evacuating, information concerning pets, shelter-in-place instructions, information concerning protective actions for schools and special populations, public inquiry telephone number, etc.) to assist the public in carrying out protective action decisions provided to them. The ORO should also be prepared to disclose and explain the Emergency Classification Level (ECL) of the incident. At a minimum, this information must be included in media briefings and/or media releases. OROs should demonstrate the capability to use language that is clear and understandable to the public within both the plume and ingestion pathway EPZs. This includes demonstration of the capability to use familiar landmarks and boundaries to describe protective action areas.

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

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

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

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

ORO should demonstrate that an effective system is in place for dealing with calls to the public inquiry hotline. Hotline staff should demonstrate the capability to provide or obtain accurate

information for callers or refer them to an appropriate information source. Information from the hotline staff, including information that corrects false or inaccurate information when trends are noted, should be included, as appropriate, in emergency information provided to the public, media briefings, and/or media releases.

All activities for this criterion must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

**PEMA NEGOTIATED EXTENT OF PLAY**

*This sub-element will be evaluated during the post-plume ingestion exercise scheduled for the week of March 7, 2011. Ingestion Counties will demonstrate their activities during the Wednesday, March 9, 2011 "Table-Top" exercise. The SRTF will demonstrate their activities on Thursday, March 10, 2011.*

## **EVALUATION AREA 6 – Support Operation/Facilities**

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

#### **INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have the capability to implement radiological monitoring and decontamination of evacuees and emergency workers, while minimizing contamination of the facility, and registration of evacuees at reception centers.

**Criterion 6.a.1: The reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h; J.12; K.5.a)**

#### **EXTENT OF PLAY**

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

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

Decontamination of evacuees/emergency workers may be simulated and conducted by interview. The availability of provisions for separately showering should be demonstrated or explained. The staff should demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs and appropriate means (for example, partitions, roped-off areas) to separate clean from potentially contaminated areas. Provisions should also exist to

separate contaminated and uncontaminated individuals, provide changes of clothing for individuals whose clothing is contaminated, and store contaminated clothing and personal belongings to prevent further contamination of evacuees or facilities. In addition, for any individual found to be contaminated, procedures should be discussed concerning the handling of potential contamination of vehicles and personal belongings.

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

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

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

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion applies to field sampling and analysis activities only. Field Sampling Teams will monitor themselves for contamination. Decontamination will be conducted by interview.*

#### **Sub-element 6.b – Monitoring and Decontamination of Emergency Worker Equipment**

##### **INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have the capability to implement radiological monitoring and decontamination of emergency worker equipment, including vehicles.

**Criterion 6.b.1: The facility/ORO has adequate procedures and resources for the accomplishment of monitoring and decontamination of emergency worker equipment, including vehicles. (NUREG-0654, K.5.b)**

##### **EXTENT OF PLAY**

The monitoring staff should demonstrate the capability to monitor equipment, including vehicles, for contamination in accordance with the Offsite Response Organizations (ORO) plans and procedures. Specific attention should be given to equipment, including vehicles, that was in

contact with individuals found to be contaminated. The monitoring staff should demonstrate the capability to make decisions on the need for decontamination of equipment, including vehicles, based on guidance levels and procedures stated in the plan and/or procedures.

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

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

All activities associated with this criterion must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **PEMA NEGOTIATED EXTENT OF PLAY**

*This criterion applies to field sampling and analysis activities only.*

**ATTACHMENT A**

**Limerick Generating Station 2011  
Extent of Play Demonstration Tables**

Post Plume (Ingestion) Exercise – Week of March 7, 2011

Out of Sequence Baseline Evaluation
Delaware – February 22, 2011
Northampton – February 22, 2011
Philadelphia – January 26, 2011

Commonwealth of Pennsylvania Ingestion Counties March 9, 2011	
Berks	Bucks
Carbon	Chester
Delaware	Lancaster
Lebanon	Lehigh
Monroe	Montgomery
Northampton	Philadelphia
Schuylkill	York

Field Teams assembly area: Penn State Cooperative Extension Office, 601 Westtown Road, Suite 370, West Chester, PA. – March 9, 2011

- Water & Soil Sampling Location: Phoenixville, PA – March 9, 2011
- Milk and Vegetation Sampling Location: Spring City, PA – March 9, 2011

Pennsylvania Bureau of Labs, 2575 Interstate Drive in Harrisburg, PA – March 9, 2011

State Recovery Task Force: PEMA Headquarters – March 10, 2011

---

STATE OF MARYLAND  
CECIL COUNTY,  
METHOD OF OPERATION

This "Method of Operation" Document includes activities for the Post Plume (Ingestion) Exercise the week of March 7 2011. This document is limited to Criterion information for the Post Plume Exercise Activities that impact Cecil County, Maryland. Cecil County is not within the Plume EPZ for the Limerick Generating Station.

**1. Limerick Generating Station (LGS)**

The plant's simulated events, radiation readings, and emergency classifications will trigger offsite exercise actions. A pre-approved exercise scenario will be used.

**2. Maryland Department of Environment (MDE)**

Personnel from MDE will not participate in the exercise. Operations at the MD State Assessment Center will not be evaluated as part of this exercise.

**3. Maryland Emergency Management Agency (MEMA) / Operations at State EOC**

Personnel from MEMA will not participate in the exercise. Operations at the MD State EOC will not be evaluated as part of this exercise.

**4. Post Plume (Ingestion) Exercise – Week of March 7, 2011:**

- March 9, 2011 – County Day

**5. Counties Designated to Participate**

**A. Post Plume Exercise (Ingestion) – Week of March 7, 2011:**

- One (1) Maryland County, Cecil County, will participate in the Post Plume Exercise. Cecil County has participated in prior Plume Exercises associated with the Peach Bottom Atomic Power Station. Therefore, Cecil County has participated in a baseline evaluation. Cecil County will participate in the Post-Plume "Tabletop" Exercise March 9, 2011 at the Exelon Emergency Operations Facility in Coatesville, PA.

**6. Controllers**

A Control Cell will be utilized during the Post-Plume "Tabletop" Exercise March 9, 2011 to simulate MDE and MEMA. Information will be provided to Cecil County in the form of written injects.

**8. Observers**

MDE and MEMA staff, qualified county emergency management personnel, and/or nuclear power plant personnel will be assigned, if required, for the purpose of observing, noting response actions and conditions, and recording observations for future use. Observers will not take an active part in the proceedings, but will interact with staff members to the extent necessary to fulfill their observer responsibilities. Coaching of players by observers is not permitted except to provide training to participants awaiting a re-demonstration.

**9. Federal Emergency Management Agency (FEMA) Evaluators**

**A. Post Plume Exercise (Ingestion)**

- Federal Evaluators will be present for the "County Table-top exercise" to be conducted on March 9, 2011 at the Exelon Emergency Operations Facility in Coatesville, PA.

**10. Demonstration Windows**

The "demonstration windows" are those periods of time designated in the exercise during which specified demonstrations will be accomplished out of sequence. The purpose of the windows is to provide for more effective demonstrations as well as permitting the release of volunteers from the exercise play at a reasonable hour.

**A. Post Plume Exercise (Week of March 7, 2011)**

- The post-plume (ingestion) County tabletop exercise will be conducted March 9, 2011 between 8:30 AM and 3:00 PM at the Exelon Emergency Operations Facility (EOF) in Coatesville, PA.

**11. Stand-down**

Upon completion of all requirements and after having informed the FEMA evaluator that all evaluation areas have been demonstrated and/or completed, Cecil County may request approval from the lead controller and FEMA to stand-down their portion of the exercise.

**12. General Concepts**

An emergency plan is drafted to address the generally expected conditions of an emergency. Not everything in the emergency plan may be applicable for a given scenario. The main purpose of an emergency plan is to assemble sufficient expertise and officials so as to properly react to the events as they occur. The responders should not be so tied to a plan that they cannot take actions that are more protective of the public. Furthermore, if, by following the plan there is a failure to protect the public health and safety, it should be noted so that the plan can be modified and the appropriate negative assessment applied.

**13. Re-demonstrations**

Any activity that is not satisfactorily demonstrated may be re-demonstrated by Cecil County during the exercise, provided it does not negatively interfere with the exercise. Refresher training may be provided by the player, observers, and/controllers. Evaluators are not permitted to provide refresher training. Re-demonstrations will be negotiated between the players, observers, controllers, and evaluators. The FEMA Project Officer may advise the Regional Assistance Committee (RAC) Chairperson prior to initiating any re-demonstration. Activities corrected from a re-demonstration will be so noted.

**14. Selected Evaluation Criteria**

Cecil County, Maryland									
Criteria	1.a.1	1.c.1	1.e.1	3.a.1	3.d.1	3.e.1	3.e.2	3.f.1	5.b.1

---

## EXTENT OF PLAY AGREEMENT

### EVALUATION AREA 1 – EMERGENCY OPERATIONS MANAGEMENT

#### Sub-element 1.a – Mobilization

##### INTENT

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) should have the capability to alert, notify, and mobilize emergency personnel and to activate and staff emergency facilities.

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

##### EXTENT OF PLAY

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

All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

##### NEGOTIATED EXTENT OF PLAY

*This criteria will be evaluated to the extent of verifying the Off Site Organization (ORO) staff participating are in accordance with their respective plans and procedures.*

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

##### INTENT

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have the capability to control their overall response to an emergency.

---

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

### **EXTENT OF PLAY**

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

All activities associated with direction and control must be performed based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless otherwise noted above or indicated in the extent of play agreement.

### **NEGOTIATED EXTENT OF PLAY**

*None*

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

#### **INTENT**

This sub-element derives from NUREG-0654, which provides that Offsite Response Organizations (ORO) have emergency equipment and supplies adequate to support the emergency response.

**Criterion 1.e.1: Equipment, maps, displays, dosimetry, potassium iodide (KI), and other supplies are sufficient to support emergency operations. (NUREG-0654, H.7,10; J.10.a, b, e, J.11; K.3.a)**

#### **EXTENT OF PLAY**

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

All instruments, including air sampling flow meters (field teams only), should be inspected, inventoried, and operationally checked before each use. Instruments should be calibrated in accordance with the manufacturer's recommendations. Unmodified CDV-700 series instruments and other instruments without a manufacturer's recommendation should be calibrated annually. Modified CDV-700 instruments should be calibrated in accordance with the recommendation of the modification manufacturer. A label indicating such calibration should be on each instrument, or the calibration frequency may be verified by other means. Additionally, instruments being

---

used to measure activity should have a range of reading sticker affixed to the side of the instrument. The above considerations should be included in 4.a.1 for field team equipment; 4.c.1 for radiological laboratory equipment (does not apply to analytical equipment; reception center and emergency worker facilities' equipment under 6.a.1; and ambulance and medical facilities' equipment under 6.d.1.

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

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

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

Quantities of dosimetry and KI available and storage location(s) will be confirmed by physical inspection at storage location(s) or through documentation of current inventory submitted during the exercise, provided in the Annual Letter of Certification submission, and/or verified during a Staff Assistance Visit. Available supplies of KI should be within the expiration date indicated on KI bottles or blister packs. As an alternative, the ORO may produce a letter from a certified private or State laboratory indicating that the KI supply remains potent, in accordance with U.S. Pharmacopoeia standards.

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated at County Day to verify the maps, information, and equipment that is necessary for understanding the impact of the deposition can be understood and thereby the protective actions recommended and implemented.*

---

## EVALUATION AREA 3 – PROTECTIVE ACTION IMPLEMENTATION

### Sub-element 3.a – Implementation of Emergency Worker Exposure Control

#### INTENT

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

**Criterion 3.a.1: The OROs issue appropriate dosimetry and procedures, and manage radiological exposure to emergency workers in accordance with the plans and procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. (NUREG-0654, K.3.a,b)**

#### EXTENT OF PLAY

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

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

During a plume phase exercise, emergency workers should demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. The emergency worker should report accumulated exposures during the exercise as indicated in the plans and procedures. ORO's should demonstrate the actions described in the plan and/or procedures by determining whether to replace the worker, to authorize the worker to incur additional exposures or to take other actions. If scenario events do not require emergency workers to seek authorizations for additional exposure, evaluators should interview at least two emergency workers, to determine their knowledge of whom to contact in the event authorization is needed and at what exposure levels. Emergency workers may use any available resources (for example, written procedures and/or co-workers) in providing responses.

Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission and adequate control of exposure can be effected for all members of the team by one dosimeter worn by the team leader. Emergency workers who are assigned to low exposure rate areas, for example, at reception centers, counting laboratories, emergency operations centers, and communications centers, may have individual direct-reading dosimeters or they may be monitored by dosimeters strategically placed in the work area. It should be noted that, even in these situations, each team member must still have their own permanent record dosimetry. Individuals without specific radiological response missions, such as farmers for animal care, essential utility service personnel, or other members of the public who must re-enter an evacuated area following or during the plume passage, should be limited to the lowest radiological exposure commensurate with completing their missions.

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated for County Day to verify the allowable exposure limits are in accordance with plans and procedure. Cecil county will demonstrate their understanding of set exposure limits, controls and ability to convey this information to emergency workers supporting recovery activities.*

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

##### **INTENT**

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

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

##### **EXTENT OF PLAY**

OROs should demonstrate the capability to select, establish, and staff appropriate traffic and access control points, consistent with protective action decisions (for example, evacuating, sheltering, and relocation), in a timely manner. OROs should demonstrate the capability to provide instructions to traffic and access control staff on actions to take when modifications in

protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled.

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

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

All activities must be based on the ORO's plans and procedures and completed as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **NEGOTIATED EXTENT OF PLAY**

*This criterion will be evaluated via interview for those Off-Site Response Organizations engaged in determining or staffing Traffic Access Control Points to the Restricted Area.*

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

##### **INTENT**

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

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

##### **EXTENT OF PLAY**

Applicable ORO's should demonstrate the capability to secure and utilize current information on the locations of dairy farms, meat and poultry producers, fisheries, fruit growers, vegetable growers, grain producers, food processing plants, and water supply intake points to implement protective actions within the ingestion pathway EPZ. ORO's should use Federal resources as identified in the FRERP, and other resources (e.g., compacts, nuclear insurers, etc.), if available. Evaluation of this criteria will take into consideration the level of Federal and other resources participating in the exercise.

---

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

### **NEGOTIATED EXTENT OF PLAY**

*NOTE: Agricultural information may be limited based on the level of play from the US Department of Agriculture. This criterion will be demonstrated during County Day. Evaluation of this criterion may be based on interview.*

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

### **EXTENT OF PLAY**

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

### **NEGOTIATED EXTENT OF PLAY**

*Data Development and Assessment will not be demonstrated by Maryland State Agencies. Federal participation will be simulated.*

---

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

#### **INTENT**

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

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

#### **EXTENT OF PLAY**

**Relocation:** OROs should demonstrate the capability to coordinate and implement decisions concerning relocation of individuals, not previously evacuated, to an area where radiological contamination will not expose the general public to doses that exceed the relocation PAGs. OROs should also demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas that have residual radiation levels above the PAGs. Areas of consideration should include the capability to communicate with OROs regarding timing of actions, notification of the population of the procedures for relocation, and the notification of, and advice for, evacuated individuals who will be converted to relocation status in situations where they will not be able to return to their homes due to high levels of contamination. OROs should also demonstrate the capability to communicate instructions to the public regarding relocation decisions. ORO's should also demonstrate the capability to provide for short-term or long-term relocation of evacuees who lived in areas that have residual radiation levels above the (first -, second -, and fifty-year) PAG's.

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

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

---

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

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

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

All activities must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **NEGOTIATED EXTENT OF PLAY**

*Cecil County will demonstrate their activities during the County Day.*

---

## **EVALUATION AREA 5 – EMERGENCY NOTIFICATION AND PUBLIC INFORMATION**

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

#### **INTENT**

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

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

#### **EXTENT OF PLAY**

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

The ORO should ensure that emergency information and instructions are consistent with protective action decisions made by appropriate officials. The emergency information should contain all necessary and applicable instructions (for example, evacuation instructions, evacuation routes, reception center locations, what to take when evacuating, information concerning pets, shelter-in-place instructions, information concerning protective actions for schools and special populations, public inquiry telephone number, etc.) to assist the public in carrying out protective action decisions provided to them. The ORO should also be prepared to disclose and explain the Emergency Classification Level (ECL) of the incident. At a minimum, this information must be included in media briefings and/or media releases. OROs should demonstrate the capability to use language that is clear and understandable to the public within both the plume and ingestion pathway EPZs. This includes demonstration of the capability to use familiar landmarks and boundaries to describe protective action areas.

The emergency information should be all-inclusive by including previously identified protective action areas that are still valid, as well as new areas. The OROs should demonstrate the

---

capability to ensure that emergency information that is no longer valid is rescinded and not repeated by broadcast media. In addition, the OROs should demonstrate the capability to ensure that current emergency information is repeated at pre-established intervals in accordance with the plan and/or procedures.

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

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

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

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

All activities for this criterion must be based on the ORO's plans and procedures and completed, as they would be in an actual emergency, unless noted above or otherwise indicated in the extent of play agreement.

#### **NEGOTIATED EXTENT OF PLAY**

*Cecil County will demonstrate their activities during the County Day.*

This page is intentionally blank.

```
##          ###
#           #
# ###      #####  ## ###  #####  #####  ## #  #  #####  #
##  #      #      ##      #      #      #  ##  ##  #  #      #
#      #      #      #      #####  #####  #  #  #  #####  #
#      #      #      #      #      #      #  #  #  #  #      #
##  #      #      #      #      #      #      #  #  #  #  ##  #
## ###  #####  #####  #####  #####  ##  ##  #  ##  ##  #####
```

Job : 133  
Date: 6/6/2011  
Time: 7:45:46 AM



**This page is intentionally blank.**

---

## EXECUTIVE SUMMARY

During the week of March 7, 2011, an evaluated Post Plume Ingestion Exercise was conducted for the 50-mile Ingestion Exposure Pathway, Emergency Planning Zone (EPZ) around the Limerick Generating Station (LGS) by the Federal Emergency Management Agency (FEMA), Region III. Out of sequence baseline evaluations were conducted for three facilities within the 50 mile ingestion zone on January 26, 2011, and February 22, 2011. The last FEMA evaluated full-scale exercise at this site was conducted on November 16, 2009.

The purpose of the Limerick Ingestion Exposure Pathway exercise was to assess the State and local offsite response organizations preparedness in responding to a radiological emergency. The exercise was held in accordance with FEMA's policies and guidance concerning the exercising of State and local Radiological Emergency Response Plans (RERP) and procedures.

FEMA wishes to acknowledge the efforts of the many individuals in the Commonwealth of Pennsylvania; their risk jurisdictions: Berks, Chester, and Montgomery Counties; the ingestion jurisdictions of Bucks, Carbon, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Northampton, Philadelphia, Schuylkill, and York Counties; State of Maryland; and Cecil County (MD) who were evaluated during this exercise.

Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still others have willingly sought this responsibility as volunteers providing vital emergency services twenty four (24) hours a day to the communities in which they live. Cooperation and teamwork of all the participants was observed during this exercise.

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

- Facility baseline evaluation conducted for Philadelphia County Emergency Operations Center on January 26, 2011.
- Facility baseline evaluation conducted for Delaware and Northampton County Emergency Operations Centers on February 22, 2011.

The Commonwealth of Pennsylvania, State of Maryland, and their respective local organizations,

---

demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. There were no Deficiencies, although three (3) Areas Requiring Corrective Action (ARCAs) were identified as a result of this exercise. Two of the ARCAs were successfully re-demonstrated during the exercise. There were three (3) ARCAs from a previous Peach Bottom Atomic Power Station (PBAPS) ingestion exercise that were successfully redemonstrated during this exercise. Two (2) new planning issues were identified.

## **SECTION 1: EXERCISE OVERVIEW**

### **1.1 Exercise Details**

**Exercise Name**

Limerick Generating Station

**Type of Exercise**

Ingestion

**Exercise Date**

March 08, 2011

**Program**

Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

**Scenario Type**

Radiological Emergency

### **1.2 Exercise Planning Team Leadership**

Michael Shuler, Sr.

Project Officer/Site Specialist

Department of Homeland Security/FEMA

Technological Hazards Program Specialist

One Independence Mall, 6th Floor

615 Chestnut Street

Philadelphia, Pennsylvania, 19106

215-931-5526

[michael.shuler@dhs.gov](mailto:michael.shuler@dhs.gov)

Alan Brinser

Exercise Supervisor

Pennsylvania Emergency Management Agency

Emergency Management Specialist

```
#
##
#####
##### ## ## ##### # ##### ## ### #####
# # # # # # # # # # # # # # # #
# ##### # # # # ##### # # # # #
# # # # # # # # # # # # # # # #
# # # # # # # # # # # # # # # #
# ##### ## ## ##### ## ##### ##### #####
#
####
```

Job : 139  
Date : 6/6/2011  
Time : 7:47:51 AM



## Suders, Joseph

---

**From:** Vyenielo, Martin  
**Sent:** Monday, June 06, 2011 7:11 AM  
**To:** Suders, Joseph  
**Subject:** FW: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)

Ft. Eustis access information

Martin L. Vyenielo  
Technological Hazards Specialist  
FEMA Region III  
Department of Homeland Security  
One Independence Mall, 6th Floor  
615 Chestnut Street  
Philadelphia, PA 19106-4404  
(215) 931-5670 (w)  
(215) 495-3624 (c)  
(215) 931-5539 (fax)  
Martin.Vyenielo@DHS.gov

-----Original Message-----

**From:** Binkley, Susan [mailto:[Susan.Binkley@vdem.virginia.gov](mailto:Susan.Binkley@vdem.virginia.gov)]  
**Sent:** Sunday, June 05, 2011 4:06 PM  
**To:** Vyenielo, Martin  
**Subject:** FW: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)

See email thread below regarding access to General Stanford ES on Fort Eustis. I will tell them that instead of Mr. Shuler it will be Mr. Suders.

-----Original Message-----

**From:** Donald Green [mailto:[donald.green@nn.k12.va.us](mailto:donald.green@nn.k12.va.us)]  
**Sent:** Wednesday, June 01, 2011 2:02 PM  
**To:** Binkley, Susan  
**Subject:** FW: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)

Susan,

Here is the correspondence with Eustis staff regarding the base access for the evaluator and controller.

DRG

Donald R. Green, CPP, CEMA, CPS  
Supervisor of Security  
Newport News Public Schools  
(O) 757-881-5061 ext. 11137

(F) 757-597-2967  
donald.green@nn.k12.va.us

-----Original Message-----

From: Donald Green  
Sent: Tuesday, May 31, 2011 9:54 AM  
To: 'Hawkins, Michael CIV USA IMCOM'  
Subject: RE: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)

Thanks Mike,

I'll let them know all this. Mr. Dishner is the fire chief of York Co. and will be in a marked FD car. Mr. Shuler will be in a rental car. Will either of those make a difference on the proof of insurance requirement?

Thanks,  
Donald

Donald R. Green, CPP, CEMA, CPS  
Supervisor of Security  
Newport News Public Schools  
(O) 757-881-5061 ext. 11137  
(F) 757-597-2967  
donald.green@nn.k12.va.us

-----Original Message-----

From: Hawkins, Michael CIV USA IMCOM  
[mailto:michael.hawkins1@us.army.mil]  
Sent: Tuesday, May 31, 2011 9:39 AM  
To: Donald Green  
Cc: Blackmore, Benjamin V Mr CIV USA IMCOM; Castro, Kevin J Mr CIV USA IMCOM  
Subject: RE: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)

Classification: UNCLASSIFIED  
Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: NONE

Mr. Green:

Mr. Dishner and Mr. Shuler should enter Fort Eustis through the main gate off exit 255A (Fort Eustis Blvd). After entering the gate, take the second left and proceed to the traffic light. General Stanford Elementary School will be directly in front of you.

As for requirements to enter post, the drivers of the vehicles should have Driver's License, vehicle registration, proof of insurance. As they enter post, stay in the right lane, which is the Visitor's Lane. I

recommend arriving at the gate 30 minutes prior to your meeting.

Let me know if you have questions.

R/  
Mike

Michael L. Hawkins  
Emergency Management/ATO  
733 MSD  
Fort Eustis, VA 23604  
(757) 878-6801

"The day soldiers stop bringing you their problems is the day you have stopped leading them. They have either lost confidence that you can lead them or concluded that you don't care. Either case is a failure of your leadership". Colin Powell

-----Original Message-----

From: Castro, Kevin J Mr CIV USA IMCOM  
Sent: Friday, May 27, 2011 2:00 PM  
To: Hawkins, Michael CIV USA IMCOM  
Cc: Blackmore, Benjamin V Mr CIV USA IMCOM; donald.green@nn.k12.va.us  
Subject: FW: VOPEX evaluation of Gen. Stanford ES (UNCLASSIFIED)  
Importance: High

Classification: UNCLASSIFIED  
Caveats: FOUO

Mike,

Can you please assist Mr. Green. Ben is out today; see message below.

kev

-----Original Message-----

From: Donald Green [mailto:donald.green@nn.k12.va.us]  
Sent: Friday, May 27, 2011 1:44 PM  
To: Castro, Kevin J Mr CIV USA IMCOM; Blackmore, Benjamin V Mr CIV USA IMCOM  
Cc: Barbara Taylor; 'Binkley, Susan'  
Subject: VOPEX evaluation of Gen. Stanford ES  
Importance: High

Good afternoon,

As we've discussed, personnel associated with the VOPEX 2011 exercise will be interviewing Ms. Taylor at Gen. Stanford Elementary School on

June 13th at 1330.

The Controller (either VDEM or Dominion staff) is Jim Dishner and the FEMA Evaluator is Mike Shuler. I don't know if they will be in separate cars or traveling together.

Can you advise the best way for them to get on base and to the school?

I am finalizing a briefing package for Ms. Taylor and will copy you two on it as well.

Thanks,

Donald

Donald R. Green, CPP, CEMA, CPS

Supervisor of Security

Newport News Public Schools

(O) 757-881-5061 ext. 11137

(F) 757-597-2967

donald.green@nn.k12.va.us

---

[Newport News Public Schools Confidentiality Notice: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender immediately by reply e-mail and destroy all copies of the original message.]

Classification: UNCLASSIFIED  
Caveats: FOUO

Classification: UNCLASSIFIED  
Caveats: NONE

Classification: UNCLASSIFIED  
Caveats: NONE

[Newport News Public Schools Confidentiality Notice: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender immediately by reply e-mail and destroy all copies of the original message.]