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Region VI
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Denton, TX 76209-3698

FEMA

June 27, 2013

Mr. Arthur Howell III
Regional Administrator
U.S. NRC, Region IV
1600 East Lamar Blvd.
Arlington, TX 76011-4511

Dear Mr. Howell:

Enclosed is a copy of the radiological emergency preparedness final report for the Arkansas Nuclear One (ANO) Medical Services drills evaluated on May 16-17, 2013. FEMA Region VI staff evaluated the Pope County Emergency Medical Services located in Russellville, Arkansas and the University of Arkansas for Medical Sciences hosptial located in Little Rock, Arkansas. There were no Deficiencies, one Area Requiring Corrective Action (ARCA), and one Plan Issue identified during the drills.

Based on the results of the drill, the offsite radiological emergency response plans and preparedness for the State of Arkansas and affected local jurisdictions provide reasonable assurance that appropriate measures can be taken to protect public health and safety in the event of a radiological emergency. Therefore, 44 CFR Part 350 approval of the offsite radiological emergency response plans and preparedness for the State of Arkansas – specific to Arkansas Nuclear One will remain in effect.

An electronic copy of this report was forwarded to NRC HQ Document Control, REP HQ Branch Chief and the REP HQ Regional Liaison Officer. Should you have questions, please contact Lisa Hammond, RAC Chair at (940) 898-5199, or Elsa Lopez, Radiological Emergency Preparedness Site Specialist for ANO, at (940) 898-5308.

Sincerely,

Lisa R. Hammond
RAC Chair

Enclosure

cc: NRC HQ Document Control Desk
DHS/FEMA Headquarters
ADH – Bernard Bevill
ADEM – David Maxwell
ANO Entergy Ops. Inc. – Robert Holeyfield

IX49

Arkansas Nuclear One

After Action Report/ Improvement Plan

Drill Date - May 16, 2013

Radiological Emergency Preparedness (REP) Program

FEMA

Published

Arkansas Nuclear One
After Action Report/Improvement Plan

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EXECUTIVE SUMMARY

On May 16-17, 2013, an out-of-sequence ambulance drill conducted in Russellville, Arkansas for the Pope County Emergency Medical Services (EMS) - St. Mary's Station followed by an out-of-sequence medical drill that was conducted at the University of Arkansas for Medical Sciences (UAMS), Little Rock, Arkansas. Personnel from the U.S. Department of Homeland Security/Federal Emergency Management Agency (DHS/FEMA) Region VI, evaluated all activities. The drills are conducted to assess the level of preparedness of local responders to react to a simulated radiological emergency at Arkansas Nuclear One (ANO). The previous UAMS and Pope County EMS - St. Mary's Station medical drill was conducted on April 12-13, 2011.

Personnel from the Pope County EMS and University of Arkansas Medical Sciences participated in the drills. Evaluation Areas demonstrated included: Equipment and Supplies to Support Operations, Implementation of Emergency Worker Exposure Control, and Support Operations/Facilities Transportation and Treatment of Contaminated Injured Individuals. Cooperation and teamwork of all participants was evident during these drills, and DHS/FEMA wishes to acknowledge these efforts.

This report contains the final evaluation of the out-of-sequence drills. The participants demonstrated knowledge of their emergency response plans and procedures and they adequately implemented them. There were no Deficiencies, one Area Requiring Corrective Action (ARCA), and one Plan Issue. The ARCA was corrected during the drill.

SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name
Arkansas Nuclear One

Type of Exercise
Drill

Exercise Date
May 16, 2013

Program
Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

Scenario Type
Radiological Emergency

1.2 Exercise Planning Team Leadership

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1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Arkansas Nuclear One drill:

- Risk Jurisdictions
  - Pope County EMS - St. Mary's Station
- Support Jurisdictions
  - University of Arkansas for Medical Sciences

SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

The DHS/FEMA Region VI Office evaluated the drill on May 16-17, 2013 to assess the capabilities of local emergency preparedness organizations in implementing their Radiological Emergency Response Plans and procedures to protect the public health and safety during a radiological emergency involving Arkansas Nuclear One (ANO). The purpose of this report is to present the results and findings on the performance of the offsite response organizations during a simulated radiological emergency.

2.2 Exercise Objectives, Capabilities and Activities

Exercise objectives and identified Capabilities/REP Criteria selected to be exercised are discussed in the Exercise Plan (EXPLAN), Appendix C.

2.3 Scenario Summary

The drill scenario was developed to evaluate the response of drill participants to an incident at Arkansas Nuclear One (ANO) requiring the transportation, treatment and decontamination of a radiologically contaminated injured individual. The drill scenario provided for the evaluation of the University of Arkansas for Medical Sciences (UAMS) and Pope County Emergency Medical Services (EMS) - St. Mary's Station.

SECTION 3: ANALYSIS OF CAPABILITIES

3.1 Drill Evaluation and Results

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities, which participated in the May 16-17, 2013 ambulance and medical drills to test the offsite emergency response capabilities of local governments and support medical centers for Arkansas Nuclear One (ANO).

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in exercise evaluation area criteria contained in the Federal Register, Vol. 67, No. 80, "FEMA - Radiological Emergency Preparedness: Exercise Evaluation Methodology" (April 25, 2002) and the REP Program Manual. Detailed information on the exercise evaluation area criteria and the extent-of-play agreement used in this exercise are found in Appendix D of this report.

3.2 Summary Results of Drill Evaluation

The matrix presented in Table 3.1, on the following page(s), presents the status of all exercise evaluation area criteria from the REP Program Manual that were scheduled for demonstration during this exercise by all participating jurisdictions and functional entities. Exercise evaluation area criteria are listed by number and the demonstration status of those evaluation area criteria is indicated by the use of the following letters:

M - Met (No Deficiency or Areas Requiring Corrective Actions [ARCAs] assessed and no unresolved ARCAs from prior exercises)

D - Deficiency assessed

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

N - Not Demonstrated

P - Plan Issue

Table 3.1 - Summary of Drill Evaluation

DATE: 2013-05-16 SITE: Arkansas Nuclear One, AR M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		Pope Co. EMS (SMS)	UAMS
Emergency Operations Management			
Mobilization	1a1		
Facilities	1b1		
Direction and Control	1c1		
Communications Equipment	1d1		
Equipment and Supplies	1e1	M	M
Protective Action Decision Making			
EW Exp. Control Decisions	2a1		
PARs	2b1		
PADs	2b2		
PADs for Disabled/Functional Needs	2c1		
Ingestion PADs	2d1		
RRR Decisions	2e1		
Protective Action Implementation			
EW Exp. Control Implementation	3a1	M	M
KI Public/Institutionalized	3b1		
PAD Imp. Disabled/Functional Needs	3c1		
PAD Imp. Schools	3c2		
TACP Establishment	3d1		
Impediments to Evacuation	3d2		
Implementation of Ingestion PADs	3e1		
Ingestion Strategies and Information	3e2		
Imp. of RRR Decisions	3f1		
Field Measurement and Analysis			
RESERVED	4a1		
Field Team Management	4a2		
Field Team Operations	4a3		
Field Team Sampling	4b1		
Laboratory Operations	4c1		
Emergency Notification and Public Info			
Initial Alert & Notification	5a1		
Backup Alert & Notification	5a3		
Exception Area Alerting	5a4		
Subsequent Public Information	5b1		
Support Operations/Facilities			
Reception Center Operations	6a1		
EW Monitoring & Decon	6b1		
Congregate Care	6c1		
Contaminated Injured Transport & Care	6d1	P	M

3.3 Criteria Evaluation Summaries

3.3.1 Risk Jurisdictions

3.3.1.1 Pope County EMS-St. Mary's Station

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

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

ISSUE NO.: 01-13-6d1-P-01

CRITERION: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals.

CONDITION: Emergency Worker was chewing gum during a simulated response to a possibly injured contaminated individual.

POSSIBLE CAUSE: Contamination control to prevent ingestion of contamination while working with a potentially contaminated patient is not addressed within the procedure.

REFERENCE: NUREG-0654/FEMA-REP-1, F.2; H.10; K.5.a, b; L.1, 4

EFFECT: This can result in the accidental ingestion of contamination in an actual event.

RECOMMENDATION: Revise the procedure to strengthen the work practices for proper contamination control to include a provision for not eating, drinking, smoking, or chewing while working in an area where contamination might be present.

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

3.3.2 Support Jurisdictions

3.3.2.1 University of Arkansas for Medical Sciences Hospital

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

a. MET: 1.e.1, 3.a.1, 6.d.1.
b. AREAS REQUIRING CORRECTIVE ACTION: 6.d.1.

ISSUE NO.: 01-13-6d1-A-02

CRITERION: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals.

CONDITION: Following the first decontamination attempt, the nurse did not change her gloves before collecting clean supplies for the next decontamination attempt. In addition, the nurse touched several other areas in the room including her own facemask. Upon correction discussion, the nurse removed her outer gloves, but did not replace them. She then proceeded with a second attempt at decontaminating the patient's wound.

POSSIBLE CAUSE: The nurse may not have received proper training on contamination control techniques. In addition, the procedure only mentions glove changes in one place, which is the Radiation Safety Officer checklist. Instructions for glove changes are not provided in the decontamination portion of the procedure.

REFERENCE: NUREG 0654, L.1; UAMS RSO Code RAD Checklist

EFFECT: Radioactive contamination can be spread to others in the decontamination room and potentially to other parts of the hospital causing additional exposure during an actual event.

CORRECTIVE ACTION DEMONSTRATED: The nurse was provided training on the need to remove potentially contaminated gloves before proceeding with other activities or additional decontamination attempts. In addition, the nurse was also provided training to use multiple layers of outer gloves to reduce the potential of contaminating the inner most pair of gloves.

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

SECTION 4: CONCLUSION

Based on the results of the drill, the offsite radiological emergency response plans and preparedness for the State of Arkansas and the affected local jurisdictions are deemed adequate to provide reasonable assurance that appropriate measures can be taken to protect the health and safety of the public in the event of a radiological emergency. Therefore, 44 CFR Part 350 approval of the offsite radiological emergency response plans and preparedness for the State of Arkansas site-specific to Arkansas Nuclear One will remain in effect.

APPENDIX A: IMPROVEMENT PLAN

Issue Number: 01-13-6d1-P-01	Criterion: 6d1
ISSUE: Emergency Worker was chewing gum during a simulated response to a possibly injured contaminated individual.	
RECOMMENDATION: Revise the procedure to strengthen the work practices for proper contamination control to include a provision for not eating, drinking, smoking, or chewing while working in an area where contamination might be present.	
CORRECTIVE ACTION DESCRIPTION:	
CAPABILITY:	PRIMARY RESPONSIBLE AGENCY:
CAPABILITY ELEMENT:	START DATE:
AGENCY POC:	ESTIMATED COMPLETION DATE:

APPENDIX B: DRILL EVALUATORS AND TEAM LEADERS

DATE: 2013-05-16, SITE: Arkansas Nuclear One, AR

LOCATION	EVALUATOR	AGENCY
Pope County EMS-St. Mary's Station	*Brad DeKorte Elsa Lopez	FEMA RVI FEMA RVI
University of Arkansas for Medical Sciences Hospital	*Nan Calhoun Brad DeKorte Elsa Lopez	FEMA RVI FEMA RVI FEMA RVI
* Team Leader		

APPENDIX C: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
ANO	Arkansas Nuclear One
DRD	Direct Reading Dosimeter
EMS	Pope County Emergency Medical Services
EW	Emergency Worker
KI	Potassium Iodide
PCEOC	Pope County Emergency Operations Center
RSO	Radiological Safety Officer
TOCD	Technical Operation Control Director
UAMS	University of Arkansas for Medical Sciences

APPENDIX D: EXERCISE PLAN

As submitted by the state.

Arkansas Nuclear One 2013 Pope County EMS/UAMS MS-1 Drill
May 16-17, 2013
Extent-of-Play (EOP) Agreement
Between
The Arkansas Department of Health's
Nuclear Planning and Response Program
and FEMA Region VI

EVALUATION AREA 1

Emergency Operations Management

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

INTENT

This sub-element is derived 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)

Locations: University of Arkansas for Medical Sciences (UAMS); Pope County EMS (St Mary's Station), Russellville

EOP:

1. **It is Arkansas policy to issue KI only to Emergency Workers (EW) and institutionalized individuals in the 10-mile EPZ.**
2. **Meters or DRDs that have "bar code" labels can have their calibration and operational check dates verified with the master database maintained by the NP&RP HP. Each meter will have a range sticker attached.**
3. **The quantities of Dosimetry and the quantities and expiration of KI will be confirmed by evaluators at locations identified in plans.**
4. **Meters that do not have "bar code" labels will have appropriate calibration stickers attached.**

ARCA: None

EVALUATION AREA 3

Protective Action Implementation

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

INTENT

This sub-element is derived from NUREG-0654, which provides that OROs should have the capability to provide for the following: distribution, use, collection, and processing of direct-reading 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)

Locations: **University of Arkansas for Medical Sciences (UAMS); Pope County EMS (St Mary's Station), Russellville**

EOP:

1. **EMS crews will use gloves and booties as necessary. Hospital teams will wear "anti-Cs" IAW hospital plans.**
2. **Dosimetry and KI will be issued IAW plans.**
3. **The RO or designee will demonstrate the EW briefing, record keeping, and procedures for issuing and returning dosimetry and KI. The use of KI will be simulated.**
4. **<u>Correction-on-the-spot</u> will be considered at these locations at the discretion of and concurrence between the evaluator and the controller. Caution should be exercised to ensure that exercise play is not interrupted.**

ARCA: **NONE**

Sub-element 6.d - Transportation and Treatment of Contaminated Injured Individuals

INTENT

This sub-element is derived from NUREG-0654, which provides that Offsite Response Organizations (ORO) should have the capability to transport contaminated injured individuals to medical facilities with the capability to provide medical services.

Criterion 6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals. (NUREG-0654, F.2; H.10; K.5.a, b; L.1, 4)

Location: **Pope County EMS (St Mary's Station), Russellville**

EOP:

1. **The Controller will contact Pope County 911 with the exercise message. Communication between the ambulance and the EMS dispatch will be demonstrated. EMS dispatch will discuss procedures for passing information to UAMS.**

2. **The EMS crew will pick up the patient at the County Complex. Prior to transfer of the patient, EMS personnel will demonstrate monitoring the patient. After patient simulated transfer, the EMS crew will demonstrate vehicle monitoring. The ambulance will not be draped.**

3. **This EA will be demonstrated at approximately 1500 on May 16, 2013**

4. ***Any real emergency will take precedence.***

5. **Correction-on-the-spot will be considered at these locations at the discretion of and concurrence between the evaluator and the controller. Caution should be exercised to ensure that exercise**

ARCA: **None**

Location: **U of A for Medical Science (UAMS), Little Rock**

EOP:

1. **This EA will be demonstrated at approximately 1000 on May 17, 2013**

2. ***Any real emergency will take precedence.***

3. **The patient will be transported to UAMS via a non-emergency vehicle.**

4. **Radiation decontamination, monitoring and contamination control will be performed by UAMS personnel.**

5. **The State Controller will contact UAMS Emergency Room with the alerting message approximately one and half (1.5) hours prior to patient arrival**

6. **The State Controller will contact UAMS Emergency Room with an update message approximately fifteen (15) minutes prior to patient arrival**

7. **UAMS personnel will not take any action to prepare for the demonstration of these evaluation areas before the one and half (1.5) hour notification.**

8. **No shift change will be performed. A list of second shift Key Personnel will be given to the evaluator.**

9. **The 1st shift may be over staffed for training purposes. Some staff identified on the 2nd shift roster may play with the 1st team. In an actual emergency this over staffing would not be used.**

ARCA: **None**

Pope County Emergency Medical Service/University of Arkansas for Medical Sciences

FEMA EVALUATION
MS-1
Emergency Medical Scenario
May 16 and 17, 2013

SCENARIO (Pope County EMS):

Members of the ANO Emergency Response Organization (ERO) are notified to assume their emergency assignments at the ANO Emergency Operations Facility (EOF) in the Reeve E. Ritchie Nuclear Training Center as a result of an ALERT being declared.

While in the process of mobilization of team members, the event progresses to a GENERAL EMERGENCY and a plume containing radioactive material was vented from the UNIT 1 Reactor Building. The wind is from 0 degrees at 7 miles per hour.

A member of the ERO is responding from his home outside the Emergency Planning Zone (EPZ). He is going from the parking lot into the EOF, when he steps into the path of a vehicle being driven by another EOF Team member. The injured person (hereafter referred to as the "Patient") is struck by the vehicle, which is moving at approximately 15 miles per hour.

The Patient impacts the front passenger side fender of the vehicle and falls backward on to the pavement, striking his head on a concrete curb.

The driver of the vehicle reports the accident by calling Pope County 911 on his cell phone. The driver tells the 911 Dispatcher that he has struck a pedestrian, who is unable to stand and is complaining of pain. He requests an ambulance and tells the Dispatcher that he thinks they may be in a radiation area.

Pope County 911 Dispatches the Pope County EMS to a vehicle/pedestrian accident at ANO and advises responding units that the caller states the accident may be in a radiation area. A call to ANO reveals that the ANO medical team is busy on site and will not be able to respond to the parking lot accident.

Upon Arrival at the scene, ambulance personnel observe the Patient lying in a supine position, with a bloody towel wrapped around the right, lower extremity. The driver states that the Patient fell backwards after impact with his car and struck the concrete curb. He is complaining of pain to his lower right leg. The driver says he thinks the Patient was initially unconscious immediately following the accident.

Radiation readings at this time are 150 cpm waste level in the area.

The following medical conditions exist:

There is a compound fracture to the lower right leg.
No arterial bleeding is detected, however, there is bleeding around the wound site.
The Patient is alert and denies loss of consciousness.
The following vital signs are present:
BP 150/90
Pulse 125
Respiration 30, unlabored
Pupils Equal and Reactive to Light
Distal Pulse present in all extremities

Additional Medical Information (Provided if Requested)
Lung Fields are clear
Movement is noted in all extremities
Medical History is negative
No known allergies

Primary Medical Survey reveals:

A compound fracture which has not been reduced below the right knee. Patient complains of pain in back of the head, just above the neck. No bleeding or deformity observed in that area.

A radiation survey of the Patient reveals the following:

The area around the wound, which impacted the vehicle, reads 15,000 cpm.

SCENARIO (UAMS):

The Pope County EMS calls the UAMS and advises them an ambulance is in route from Russellville with a patient which has a compound fracture to the lower right extremity and who is contaminated with radioactive material. The injury was the result of a motor vehicle/pedestrian accident.

The following patient information is provided:

There is a compound fracture to the lower right leg.
No arterial bleeding is detected, however, there is bleeding around the wound site.
The Patient is alert and denies loss of consciousness.
The following vital signs are present:
BP 150/90
Pulse 125
Respiration 30, unlabored
Pupils Equal and Reactive to Light
Distal Pulse present in all extremities
Lung Fields are clear
Movement is noted in all extremities
Medical History is negative
No known allergies

A radiation survey of the Patient reveals the following:

The area around the wound, which impacted the vehicle, reads 15,000 cpm.

The following information is made available to UAMS personnel during the decontamination procedure:

Survey following first decontamination of wound is 10,000 cpm
Survey following second decontamination wound is 5,000 cpm
Survey following third decontamination is wound is 1,250 cpm
Survey following fourth decontamination is 1,250 cpm