



Arkansas Nuclear One

# After Action Report/ Improvement Plan

Exercise Date - September 22, 2010

Radiological Emergency Preparedness (REP) Program



**FEMA**

*Published November 30, 2010*

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## EXECUTIVE SUMMARY

On September 22, 2010, a biennial Radiological Emergency Preparedness (REP) exercise was conducted in the plume exposure pathway emergency planning zone (EPZ) around Arkansas Nuclear One (ANO) located near Russellville, Pope County, Arkansas. The U.S. Department of Homeland Security/Federal Emergency Management Agency (DHS/FEMA) Region VI evaluated the exercise. The purpose was to assess the level of preparedness of state and local responders to react to a simulated radiological emergency at ANO. This exercise was held in accordance with DHS/FEMA policies and guidance concerning the implementation of state and local radiological emergency preparedness plans and procedures.

The previous exercise at this site was an Ingestion Exposure Pathway Exercise conducted on May 21-22, 2008. The qualifying emergency preparedness exercise was conducted on October 1, 1980. There have been twenty-one evaluated exercises, including the exercise on September 22, 2010, plus several drills conducted since 1984.

DHS/FEMA Region VI wishes to acknowledge the efforts of the many individuals in the State of Arkansas, Pope, Yell, Logan, Johnson, and Conway Counties, National Oceanic and Atmospheric Administration (NOAA) Forecast Office, KXRJ Radio Station, and surrounding jurisdictions who participated in this exercise. Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still they have willingly sought this responsibility by volunteering to provide vital emergency services to their communities. Cooperation and teamwork of all the participants was evident during this exercise.

This report contains the final written evaluation of the biennial exercise. The state and local organizations, except where noted in this report, demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. There were no Deficiencies, three Areas Requiring Corrective Action (ARCA), one of which was corrected during the exercise, and two planning issues identified. Also, one previous ARCA was resolved during the exercise.

## **SECTION 1: EXERCISE OVERVIEW**

### **1.1 Exercise Details**

**Exercise Name**

Arkansas Nuclear One

**Type of Exercise**

Plume

**Exercise Date**

September 22, 2010

**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 exercise:

### State Jurisdictions

Arkansas Department of Health  
Arkansas Department of Emergency Management

### Risk Jurisdictions

Pope County Office of Emergency Management  
Pope County Judge  
Pope County Sheriff's Office  
Pope County Fire Coordinator  
Pope County Health Department  
Pope County 911  
Pope County Emergency Medical Services  
City of Russellville Mayor's Office  
Russellville Police Department  
City of Russellville Fire Department  
City of Paris Fire Department  
Midway Volunteer Fire Department



Driggs Volunteer Fire Department  
Subiaco Volunteer Fire Department  
Johnson County Office of Emergency Management  
Johnson County Judge  
Johnson County Sheriff's Department  
Johnson County Rural Fire Department #1  
Johnson County Road Department  
Spadra Township Constable  
Logan County Office of Emergency Management  
Logan County Judge  
Logan County Sheriff's Office  
Logan County Road Department  
Logan County Extension Services  
Logan County Emergency Medical Services  
Logan County 911  
City of Paris Police Department  
Scranton Volunteer Fire Department  
Yell County Office of Emergency Management  
Yell County Judge  
Yell County Sheriff's Office  
Yell County Fire Department  
Dardanelle Police Department  
Dardanelle Fire Department  
Yell County School District  
Danville Fire Department  
Ola Fire Department  
Danville Police Department  
Yell County 911  
Yell County Emergency Medical Services  
Support Jurisdictions  
Dover School District  
Arkansas Tech University  
Private Organizations  
American Red Cross

Arkansas Nuclear One - Entergy Operations Inc.

Saint Mary's Regional Medical Center

Radio Amateur Civil Emergency Service (RACES)

KXRJ 91.9 FM Radio Station

Federal Jurisdictions

United States Nuclear Regulatory Commission

National Oceanic and Atmospheric Administration

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

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

The DHS/FEMA Region VI Office evaluated the exercise on September 22, 2010 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 represent 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 F.

### **2.3 Scenario Summary**

The exercise scenario was developed to evaluate the response of exercise participants to an incident requiring evacuation of the public from the 10-mile Emergency Planning Zone surrounding Arkansas Nuclear One (ANO). The exercise scenario provided for the evaluation of the Arkansas Department of Emergency Management (ADEM), Arkansas Department of Health (ADH), Johnson, Logan, Pope, and Yell Counties, and Local Emergency Services to manage emergency operations, provide and implement protective action decisions, provide field measurement and analysis, alert and notify the public, and provide support operations and facilities.

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## **SECTION 3: ANALYSIS OF CAPABILITIES**

### **3.1 Exercise Evaluation and Results**

Contained in this section are the results and findings of the evaluation of all jurisdictions and functional entities, which participated in the Arkansas Nuclear One (ANO) exercise to test the off-site emergency response capabilities of State and local governments in the 10-mile Emergency Planning Zone (EPZ) surrounding ANO.

Each jurisdiction and functional entity was evaluated on the basis of its demonstration of criteria delineated in the exercise evaluation areas as outlined in the April 25, 2002, Federal Register, Radiological Emergency Preparedness: Evaluation Methodology. Detailed information on the exercise evaluation area criteria and the extent of play agreement used in this exercise are found in Appendix F of this report.

### **3.2 Summary Results of Exercise 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 ARCAs assessed and no unresolved ARCAs from prior exercises)

D - Deficiency assessed

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

P - Plan Issue

N - Not Demonstrated

Table 3.1 - Summary of Exercise Evaluation (2 pages)

<p style="text-align: center;">DATE: 2010-09-22 SITE: Arkansas Nuclear One, AR</p> <p style="text-align: center;">M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated</p>			State EOC	ADH ECC	ADH/SEOF	AR FRMT 1	AR FRMT 2	ANO ENC	Alt. JIC	Johnson County EOC & T/ACP	Logan County EOC & T/ACP	Pope County EOC & T/ACP
Emergency Operations Management												
Mobilization	1a1	M	M	M				M	M	M	M	M
Facilities	1b1											
Direction and Control	1c1	M		M						M	M	M
Communications Equipment	1d1	M	M	M	M	M	M	M	M	M	M	M
Equip & Supplies to support operations	1e1	M	M	M	A	M	M	M	M	M	M	M
Protective Action Decision Making												
Emergency Worker Exposure Control	2a1			M						M	M	M
Radiological Assessment and PARs	2b1			M								
Decisions for the Plume Phase -PADs	2b2									M	M	M
PADs for protection of special populations	2c1									M	M	M
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1											
Rad Assessment and Decision making concerning Relocation, Reentry, and Return	2e1											
Protective Action Implementation												
Implementation of emergency worker exposure control	3a1			M	M	M				M	M	A
Implementation of KI decision	3b1			M	M	M				M	M	M
Implementation of protective actions for special populations - EOCs	3c1									M	M	M
Implementation of protective actions for Schools	3c2											
Implementation of traffic and access control	3d1									M	M	M
Impediments to evacuation are identified and resolved	3d2									M	M	M
Implementation of ingestion pathway decisions - availability/use of info	3e1											
Materials for Ingestion Pathway PADs are available	3e2											
Implementation of relocation, re-entry, and return decisions.	3f1											
Field Measurement and Analysis												
Adequate Equipment for Plume Phase Field Measurements	4a1				M	M						
Field Teams obtain sufficient information	4a2			M								
Field Teams Manage Sample Collection Appropriately	4a3				M	M						
Post plume phase field measurements and sampling	4b1											
Laboratory operations	4c1											
Emergency Notification and Public Info												
Activation of the prompt alert and notification system	5a1			M								
Activation of the prompt alert and notification system - Fast Breaker	5a2											
Activation of the prompt alert and notification system - Exception areas	5a3											
Emergency information and instructions for the public and the media	5b1			M				M	M			
Support Operations/Facilities												
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												
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**Table 3.1 - Summary of Exercise Evaluation (Continued, page 2/2)**

<p align="center">DATE: 2010-09-22 SITE: Arkansas Nuclear One, AR</p> <p align="center">M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated</p>			Yell County EOC & T/ACP	Dover SD	Danville Reception Center	Paris DCC	Pope County EMS	St. Marys MC	KXRJ	NOAA NLR
Emergency Operations Management										
Mobilization	1a1	M								
Facilities	1b1									
Direction and Control	1c1	M								
Communications Equipment	1d1	M								
Equip & Supplies to support operations	1e1	M		M	M	M	M			
Protective Action Decision Making										
Emergency Worker Exposure Control	2a1	M								
Radiological Assessment and PARs	2b1									
Decisions for the Plume Phase -PADs	2b2	M								
PADs for protection of special populations	2c1	M								
Rad Assessment and Decision making for the Ingestion Exposure Pathway	2d1									
Rad Assessment and Decision making concerning Relocation, Reentry, and Return	2e1									
Protective Action Implementation										
Implementation of emergency worker exposure control	3a1	M	M	M	M	M	M			
Implementation of KI decision	3b1	M								
Implementation of protective actions for special populations - EOCs	3c1	M								
Implementation of protective actions for Schools	3c2		M							
Implementation of traffic and access control	3d1	M								
Impediments to evacuation are identified and resolved	3d2	M								
Implementation of ingestion pathway decisions - availability/use of info	3e1									
Materials for Ingestion Pathway PADs are available	3e2									
Implementation of relocation, re-entry, and return decisions.	3f1									
Field Measurement and Analysis										
Adequate Equipment for Plume Phase Field Measurements	4a1									
Field Teams obtain sufficient information	4a2									
Field Teams Manage Sample Collection Appropriately	4a3									
Post plume phase field measurements and sampling	4b1									
Laboratory operations	4c1									
Emergency Notification and Public Info										
Activation of the prompt alert and notification system	5a1								P	M
Activation of the prompt alert and notification system - Fast Breaker	5a2									
Activation of the prompt alert and notification system - Exception areas	5a3									
Emergency information and instructions for the public and the media	5b1									
Support Operations/Facilities										
Mon / decon of evacuees and emergency workers, and registration of evacuees	6a1			M	M					
Mon / decon of emergency worker equipment	6b1									
Temporary care of evacuees	6c1			M	M					
Transportation and treatment of contaminated injured individuals	6d1						M	P		



## **3.3 Criteria Evaluation Summaries**

### **3.3.1 Arkansas Jurisdictions**

#### **3.3.1.1 Arkansas State Emergency Operations Center**

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

#### **3.3.1.2 Arkansas Department of Health, Little Rock Emergency Communications Center**

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

#### **3.3.1.3 Arkansas Department of Health at the State Emergency Operations Facility**

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



#### **3.3.1.4 Arkansas Field Radiological Monitoring Team One**

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

ISSUE NO.: 01-10-1e1-A-03

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

CONDITION: The radiation survey instruments consisted of two Ludlum Model 2241-3 instruments. Each with four detector probes; NaI scintillation probe model 44-2, pancake probe model 44-9, GM probe with a side window beta/gamma detector model 44-38, and a high range GM probe model 133-7. One of the survey instruments was calibrated on August 2, 2010, with calibration due on August 2, 2011. The other instrument was calibrated on September 1, 2010, with calibration due on September 1, 2011.

Operational checks were performed on each instrument with each detector probe. A label on each instrument identified what each probe should measure when exposed to the source mounted on the side of the instrument. However, there was no range of readings identified on the instrument to assure that the instrument was operating properly when the measured activity was not exactly equal to the corresponding number on the label.

POSSIBLE CAUSE: Failure to follow FEMA guidance as documented in the Federal Register Notice, April 25, 2002, Radiological Emergency Preparedness: Exercise Evaluation Methodology, Criterion 1.e.1

REFERENCE: NUREG 0654, H.7, 10; J.10.a,b,e; J.11; K.3.a  
Federal Register Notice, April 25, 2002

EFFECT: Without an identified range of readings for the operational check, the individual performing the instrument check has no way to determine if the instrument is operating properly.

RECOMMENDATION: A range of readings label should be affixed to each instrument identifying the range that indicates the instrument is operating properly when measuring a specific source.

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

### **3.3.1.5 Arkansas Field Radiological Monitoring Team Two**

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

### **3.3.1.6 Arkansas Nuclear One Emergency News Center**

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

ISSUE NO.: 01-08-5b1-A-02

ISSUE: Media Release #6, which announced the General Emergency (GE) classification and the beginning of the release of radioactive material, was not issued in a timely manner. One hour and twenty-two minutes elapsed between the announcement of the release and the GE and the fax of Media Release #6 to the Alternate Joint Information Center (JIC). Issuance of this Media Release lagged that of an Entergy News Release describing the same condition by fifty-five minutes.

**CORRECTIVE ACTION DEMONSTRATED:** The ENC provided electronic copies of issued Media Releases to the Alternate JIC staff with procedural direction for them to unilaterally correct minor errors themselves. The Alternate JIC did not return any Media Release during the exercise. In addition, the ENC employed an independent reviewer whose sole function was to focus on typographic and similar non-substantive errors to reduce the likelihood that a Media Release required correction.

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

### **3.3.1.7 Alternate Joint Information Center**

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

### **3.3.2 Risk Jurisdictions**

#### **3.3.2.1 Johnson County Emergency Operations Center and Traffic/Access Control Point**

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

#### **3.3.2.2 Logan County Emergency Operations Center and Traffic/Access Control Point**

- a. **MET:** 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.c.1, 3.d.1, 3.d.2.
- b. **AREAS REQUIRING CORRECTIVE ACTION:** None
- c. **DEFICIENCY:** None
- d. **PLAN ISSUES:** None

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

### **3.3.2.3 Pope County Emergency Operations Center and Traffic/Access Control Point**

- a. MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.b.1, 3.c.1, 3.d.1, 3.d.2.
- b. AREAS REQUIRING CORRECTIVE ACTION: 3.a.1.

ISSUE NO.: 01-10-3a1-A-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: Pope County Radiological Emergency Response Plan, Chapter 8 requires a thermoluminescent dosimeter (TLD) be issued to each emergency worker that "may be exposed to radiation." The Pope County Emergency Operations Center (EOC) was in the plume pathway where emergency workers would have been exposed to radiation. TLDs were not issued as required by the plan to the emergency workers located at the EOC.

POSSIBLE CAUSE: Group monitoring was established within the EOC with direct reading dosimeters placed at various locations throughout the facility and the need for issuing permanent record TLDs was overlooked.

REFERENCE: Pope County Radiological Emergency Response Plan Chapter 8, FEMA REP Evaluation Criteria 3.a.1, and NUREG-0654/FEMA-REP-1 K.3.a.b

EFFECT: Failure to follow the plan will result in no individual permanent record of exposure to emergency workers.

RECOMMENDATION: Since the Pope County EOC is located in the 10 mile EPZ, all EOC staff members should have been considered emergency workers and issued TLDs.

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

#### **3.3.2.4 Yell County Emergency Operations Center and Traffic/Access Control Point**

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

#### **3.3.2.5 Dover School District**

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

#### **3.3.2.6 Danville Reception Center**

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

### **3.3.2.7 Paris Designated Care Center**

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

### **3.3.2.8 Pope County EMS**

- a. MET: 1.e.1, 3.a.1, 6.d.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 Support Jurisdictions**

#### **3.3.3.1 Saint Mary's Medical Center**

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

ISSUE NO.: 01-10-6d1-A-04

CRITERION: 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)

CONDITION: The nurse in the Radiation Emergency Area (REA) did not perform a glove change prior to handling clean wipes used in decontamination efforts after disposing of contaminated clothing and waste.

REA staff attempted to decontaminate the leg wound multiple times with Saline and

did not replace the surgical pad underneath the leg.

POSSIBLE CAUSE: Procedures for contamination control were not followed.

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

EFFECT: Possible cross contamination may occur. Decontamination threshold levels would not be achieved.

CORRECTIVE ACTION DEMONSTRATED: A timeout was called and the nurse was provided training on proper contamination control measures. The nurse's hands were surveyed to ensure no cross contamination had occurred. The nurse also performed a glove change and was aware of the need to change gloves (at appropriate times) for the remainder of the drill.

The REA staff self-recognized the failure to change the surgical pad underneath the patient's leg. The surgical pad was replaced with a clean pad and the wound was surveyed. A reduction in counts per minute readings occurred.

- c. DEFICIENCY: None
- d. PLAN ISSUES: 6.d.1.

ISSUE NO.: 01-10-6d1-P-05

CRITERION: 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)

CONDITION: The Saint Mary's Hospital plans and procedures do not provide a trigger point or threshold value to determine what is considered decontamination.

POSSIBLE CAUSE: Emergency workers do not have a clear value established to determine when decontamination has been achieved.

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

EFFECT: Lack of understanding of what is considered to be decontamination.

RECOMMENDATION: Establish decontamination values and clearly state in Saint Mary's Hospital plans and procedures.

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

### **3.3.4 Private Organizations**

#### **3.3.4.1 ENS Radio Station KXRJ**

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

ISSUE NO.: 01-10-5a1-P-02

CRITERION: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite officials to notify the public of an emergency situation. (10 CFR Part 50, Appendix E & NUREG-0654, E.1.,4.,5.,6.,7.)

CONDITION: The radio station is only manned approximately thirty hours per week. Only two individuals, the Director of Broadcasting and the Chief Engineer, are trained and qualified to receive and broadcast protective active messages. In a real event, there is a possibility they may not be readily available to act upon the protective action messages. Additionally, the radio station employees were unsure of the need of, or directions from the State, to take KI or use available personal dosimetry.

POSSIBLE CAUSE: The radio station is an educational station that has limited



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capabilities. The inability to hire full time staff limits the station's ability to adequately respond when needed. In addition, when the station is manned, it is operated by students who are not trained on the Emergency Alert System.

REFERENCE: Criterion 5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite officials to notify the public of an emergency situation. (10 CFR Part 50, Appendix E & NUREG-0654, E.1.,4.,5.,6.,7.)

EFFECT: A delay could occur in broadcasting protective action messages.

RECOMMENDATION: Since the Arkansas Department of Health (ADH) has the capability to electronically override normal programming and broadcast emergency information, this should be included in the plan/procedures.

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

### **3.3.5 Federal Jurisdictions**

#### **3.3.5.1 NOAA North Little Rock**

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

## **SECTION 4: CONCLUSION**

Based on the results of the exercise, 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

<b>Issue Number: 01-10-1e1-A-03</b>		<b>Criterion: 1e1</b>	
<p><b>ISSUE:</b> The radiation survey instruments consisted of two Ludlum Model 2241-3 instruments. Each with four detector probes; NaI scintillation probe model 44-2, pancake probe model 44-9, GM probe with a side window beta/gamma detector model 44-38, and a high range GM probe model 133-7. One of the survey instruments was calibrated on August 2, 2010, with calibration due on August 2, 2011. The other instrument was calibrated on September 1, 2010, with calibration due on September 1, 2011.</p> <p>Operational checks were performed on each instrument with each detector probe. A label on each instrument identified what each probe should measure when exposed to the source mounted on the side of the instrument. However, there was no range of readings identified on the instrument to assure that the instrument was operating properly when the measured activity was not exactly equal to the corresponding number on the label.</p> <p><b>RECOMMENDATION:</b> A range of readings label should be affixed to each instrument identifying the range that indicates the instrument is operating properly when measuring a specific source.</p>			
<p><b>CORRECTIVE ACTION DESCRIPTION:</b></p>			
CAPABILITY:		PRIMARY RESPONSIBLE AGENCY:	
CAPABILITY ELEMENT:		START DATE:	
AGENCY POC:		ESTIMATED COMPLETION DATE:	

<b>Issue Number: 01-10-5a1-P-02</b>		<b>Criterion: 5a1</b>	
<p><b>ISSUE:</b> The radio station is only manned approximately thirty hours per week. Only two individuals, the Director of Broadcasting and the Chief Engineer, are trained and qualified to receive and broadcast protective action messages. In a real event, there is a possibility they may not be readily available to act upon the protective action messages. Additionally, the radio station employees were unsure of the need of, or directions from the State, to take KI or use available personal dosimetry.</p> <p><b>RECOMMENDATION:</b> Since the Arkansas Department of Health (ADH) has the capability to electronically override normal programming and broadcast emergency information, this should be included in the plan/procedures.</p>			
<p><b>CORRECTIVE ACTION DESCRIPTION:</b></p>			
CAPABILITY:		PRIMARY RESPONSIBLE AGENCY:	
CAPABILITY ELEMENT:		START DATE:	
AGENCY POC:		ESTIMATED COMPLETION DATE:	

<b>Issue Number: 01-10-3a1-A-01</b>		<b>Criterion: 3a1</b>	
<p><b>ISSUE:</b> Pope County Radiological Emergency Response Plan, Chapter 8 requires a thermoluminescent dosimeter (TLD) be issued to each emergency worker that "may be exposed to radiation." The Pope County Emergency Operations Center (EOC) was in the plume pathway where emergency workers would have been exposed to radiation. TLDs were not issued as required by the plan to the emergency workers located at the EOC.</p>			
<p><b>RECOMMENDATION:</b> Since the Pope County EOC is located in the 10 mile EPZ, all EOC staff members should have been considered emergency workers and issued TLDs.</p>			
<p><b>CORRECTIVE ACTION DESCRIPTION:</b></p>			
CAPABILITY:		PRIMARY RESPONSIBLE AGENCY:	
CAPABILITY ELEMENT:		START DATE:	
AGENCY POC:		ESTIMATED COMPLETION DATE:	

<b>Issue Number: 01-10-6d1-P-05</b>		<b>Criterion: 6d1</b>	
<p><b>ISSUE:</b> The Saint Mary's Hospital plans and procedures do not provide a trigger point or threshold value to determine what is considered decontamination.</p>			
<p><b>RECOMMENDATION:</b> Establish decontamination values and clearly state in Saint Mary's Hospital plans and procedures.</p>			
<p><b>CORRECTIVE ACTION DESCRIPTION:</b></p>			
CAPABILITY:		PRIMARY RESPONSIBLE AGENCY:	
CAPABILITY ELEMENT:		START DATE:	
AGENCY POC:		ESTIMATED COMPLETION DATE:	

## APPENDIX B: BEST PRACTICES

### 1. Media Release Templates

**Summary:** The ENC uses pre-scripted templates for media releases that allow expeditious and accurate development of information that is routinely required during exercises and incidents.

**Description:** The ADH templates contain appropriate boilerplate, but also allow the writer to insert affected protective action zones in the specific template and receive appropriate details. For example, by inputting affected school zones, the media release automatically lists the affected schools but also includes their host destinations. For evacuations, routing information is automatically included when protective action zones are entered.

## APPENDIX C: EXERCISE TIMELINE

Table 1 presents the times at which key events and activities occurred during the ANO Plume Exercise held on September 22, 2010.

Table 1 - Exercise Timeline  
DATE: 2010-09-22, SITE: Arkansas Nuclear One, AR

Emergency Classification Level or Event	Time Utility Declared	State EOC	ADH ECC	ADH/SEOF	ANO ENC	Alt. JIC	Johnson County EOC & T/ACP
Unusual Event	0832	0842	0843	0845	0845		0845
Alert	0932	0948		0946	0946	0947	0948
Site Area Emergency	1004	1014		1014	1014	1015	1015
General Emergency	1049	1102		1049	1049	1058	1100
Simulated Rad. Release Started	0940	1123		0957	0957	1058	1123
Simulated Rad. Release Terminated	1300	1305					
Facility Declared Operational		0910		1015	1015	0949	0902
Declaration of State of Emergency		1025		1025	1025		1020
Exercise Terminated		1305		1254	1254	1300	1255
Early Precautionary Actions:		1018		1013	1013		0943
1st Protective Action Decision:		1102		1037	1026		1010
1st Siren Activation				1044	1044		
1st EAS or EBS Message				1045	1045		
2nd Protective Action Decision:				1137	1137		1129
2nd Siren Activation				1144	1144		
2nd EAS or EBS Message				1146	1146		
KI Administration Decision:		1058		1051	1051		1057

**Table 1 - Exercise Timeline**  
**DATE: 2010-09-22, SITE: Arkansas Nuclear One, AR**

Emergency Classification Level or Event	Time Utility Declared	Logan County EOC & T/ACP	Pope County EOC & T/ACP	Yell County EOC & T/ACP	KXRJ	NOAA NLR
Unusual Event	0832	0844	0843	0840		
Alert	0932	0948	0947	0943		
Site Area Emergency	1004	1017	1016	1012		
General Emergency	1049	1102	1055	1055		
Simulated Rad. Release Started	0940	1122	1228	1120		
Simulated Rad. Release Terminated	1300		1252			
Facility Declared Operational		0846	0914	0955		
Declaration of State of Emergency		1025	0850	1010		
Exercise Terminated		1255	1252	1254		
Early Precautionary Actions:			1010	1031		
1st Protective Action Decision:		1035	1034			
1st Siren Activation				1044		
1st EAS or EBS Message					1044	1048
2nd Protective Action Decision:		1131				
2nd Siren Activation						
2nd EAS or EBS Message						
KI Administration Decision:		1059	1056	1055		

## APPENDIX D: EXERCISE EVALUATORS AND TEAM LEADERS

DATE: 2010-09-22, SITE: Arkansas Nuclear One, AR

LOCATION	EVALUATOR	AGENCY
Arkansas State Emergency Operations Center	*Joseph Keller	ICF
Arkansas Department of Health, Little Rock Emergency Communications Center	*Dan Feighert	FEMA Region 8
Arkansas Department of Health at the State Emergency Operations Facility	Nan Calhoun *Richard Grundstrom David Petta	DHS/FEMA ICF ICF
Arkansas Field Radiological Monitoring Team One	*Daryl Thome	ICF
Arkansas Field Radiological Monitoring Team Two	George Brozowski	EPA-R6
Arkansas Nuclear One Emergency News Center	*Walter Gawlak	ICF
Alternate Joint Information Center	*Bill Bischof Todd Davidson Bart Ray	DHS/FEMA ICF ICF
Johnson County Emergency Operations Center and Traffic/Access Control Point	*Scotty Hargrave John Wills	FDA ICF
Logan County Emergency Operations Center and Traffic/Access Control Point	Alan Bevan *Brad DeKorte	ICF DHS/FEMA
Pope County Emergency Operations Center and Traffic/Access Control Point	*Linda Gee Rosemary Samsel	DHS/FEMA ICF
Yell County Emergency Operations Center and Traffic/Access Control Point	Don Carlton *Elsa Lopez	FEMA Region 1 DHS/FEMA
Dover School District	*Linda Gee	DHS/FEMA
Danville Reception Center	Brad DeKorte Scott Flowerday *Tim Pflieger	DHS/FEMA DHS/FEMA DHS/FEMA
Paris Designated Care Center	Brad DeKorte *Elsa Lopez David Petta Tim Pflieger	DHS/FEMA DHS/FEMA ICF DHS/FEMA
Pope County EMS	*Tim Pflieger	DHS/FEMA
Saint Mary's Medical Center	Nan Calhoun *Brad DeKorte	DHS/FEMA DHS/FEMA
ENS Radio Station KXRJ	*Reggie Cope	FDA
NOAA North Little Rock	*Dan Feighert	FEMA Region 8
* Team Leader		



## APPENDIX E: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
ADEM	Arkansas Department of Emergency Management
ADH	Arkansas Department of Health
AJIC	Alternate Joint Information Center
ANG	Arkansas National Guard
ANO	Arkansas Nuclear One
ARC	American Red Cross
ARCA	Areas Requiring Corrective Action
ARES	Amateur Radio Emergency Services
AWIN	Arkansas Wireless Information Network
CDE	Committed Dose Equivalent
DCC	Designated Care Center
DCF	Dose Conversion Factor
DEF/VS	Dedicated Emergency Facsimile/ Voice System
DO	Duty Officer
DRD	Direct Reading Dosimeters
EAS	Emergency Alert System
ECC	Emergency Communications Center
ECL	Emergency Classification Level
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
ENC	Emergency News Center
ENS	Emergency Notification System
EOC	Emergency Operations Center
EOF	Emergency Operations Facility
EPA	Environmental Protection Agency
EPZ	Emergency Planning Zone
ER	Emergency Room
ERO	Emergency Response Organization
EW	Emergency Worker
FMTC	Field Monitoring Team Controller
FTC	Field Team Control
FTL	Field Team Leader
GE	General Emergency
HAN	Health Alert Network

HP	Health Physicist
KI	Potassium Iodide
LGL	Local Government Liaison
MS	Middle School
NERN	Nuclear Emergency Radio Network
NOAA	National Oceanic and Atmospheric Administration
NOUE	Notification of Unusual Event
NP & RP	Nuclear Planning and Response Program
NWS	National Weather Service
OSL	Optically Stimulated Luminescent
PAA	Protective Action Advisory
PAD	Protective Action Decision
PAZ	Protective Action Zone
PIO	Public Information Officer
PIT	Public Information Team
PNM	Public Notification Messages
PRD	Permanent Record Dosimeter
RACES	Radio Amateur Civil Emergency Service
RCM	Reception Center Manager
REA	Radiological Emergency Area
REP	Radiological Emergency Preparedness
RERP	Radiological Emergency Response Plan
RMC	Regional Medical Center
RO	Radiological Officer
RPT	Radiation Protection Technician
RRT	Radiological Response Team
RRTL	Radiological Response Team Lead
SAE	Site Area Emergency
SDO	Staff Duty Officer
SEOC	State Emergency Operations Center
SEOF	State Emergency Operations Facility
SOP	Standard Operating Procedures
TACP	Traffic and Access Control Point
TC	Team Chief
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent dosimeter
TOCD	Technical Operations Control Director
UHF	Ultra High Frequency
VHF	Very High Frequency
WDR	Wash Down Room

WFO	Weather Forecast Office
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## **APPENDIX F: EXERCISE PLAN**

## **Narrative Summary**

(Note: All scenario times are approximate.)

The scenario will begin on Unit 2 at 0745 on September 22, 2010.

Unit 1 is not affected by the scenario events, but a Unit 1 Shift Manager and STA will be available.

- Unit 1 – 100% power with no apparent problems
- Unit 2
  - 100% power for >30 days
  - ~250 EFPD
  - 2P-36A is the Operating Charging Pump
  - 2C-5B Condenser Vacuum Pump in red tagged out. Motor must be replaced. Cause of failure is motor insulation damage. Motor due onsite at 1000 hours today.

The drill will begin with the crew accepting responsibility for the plant at approximately 0745.

At 0747, Control Element Assembly (CEA) #10 will drop into the core. Operations will contact Maintenance for support and begin a power reduction to approximately 72% power.

Once the CEA has malfunctioned, Operations should contact I&C to troubleshoot the malfunction and request Reactor Engineering to report to the Unit 2 Simulator for recovery efforts.

At 0807, I&C will have the ACTM card replaced and the system prepared for testing.

At 0815, while Operations is recovering the dropped CEA, the count rate on the Reactor Coolant System (RCS) Letdown Radiation Monitor, 2RITS-4806A and B will begin to rise.

At 0830, the RCS Letdown Radiation Monitor (2RITS-4806B) will read  $>5.5E5$  cpm. The Shift Manager should declare an Notification of Unusual Event (NUE) emergency class based upon the following Emergency Action Level (EAL):

**EAL 1.1, "RCS Activity indicates  $>0.1\%$  Fuel Cladding Failure"**

The Shift Manager will request Chemistry to sample the RCS and perform continuous RCS sampling in accordance with Procedure 2607.001, Attachment 17 (RCS Liquid Sampling with up to 5% failed Fuel). Radiation Protection and Chemistry personnel should provide information to the Shift Manager for failed fuel determinations.

Offsite authorities will be notified (NRC notification will be simulated). The Shift Engineer will notify selected plant personnel in accordance Procedure 1903.011.

At 0925, a primary to secondary tube leak will develop in Steam Generator "A". The leak will ramp up to  $\sim 50$  gpm quickly and then increase up to 200 gpm over 60 minutes. The leak will result in an elevated activity reading on the Radwaste Area (RWA) Ventilation but will not exceed federally approved limits.

If not already begun, the Shift Manager will instruct the Control Room staff to place the reactor in Hot Shutdown. The operating staff will commence a plant shutdown at approximately 30% per hour.

The above conditions meet the criteria for the following EALs:

**NUE - EAL 2.1, "RCS Leakage"**

**Alert - EAL 2.2, "RCS Leakage  $> 44$  gpm"**

**NUE - EAL 3.2, "S/G Tube Leak  $>$  Tech Spec Limits"**

When the RCS leak rate is determined, the Shift Manager should declare an ALERT emergency class based upon the following EAL.

**EAL 2.2, "RCS Leakage  $> 44$  gpm"**

Due to elevated radiation levels throughout the plant, the following EAL may be used to declare an Alert.

**ALERT      EAL 5.5, "High Radiation/Airborne Levels"**

Offsite authorities will be notified (NRC notification will be simulated). The ANO Emergency Response Organization will be notified and instructed to respond to their Emergency Response facilities.

At 0955, the primary to secondary tube leak will be approximately 88 gpm. Operations may trip the plant. Immediately following the trip Condenser Vacuum Pump 2C-5A will trip. RCS activity will continue to rise.

Condenser vacuum will drop over the next few minutes. As main steam pressure rises, Main Steam Safety Valve 2PSV-1002, will lift and stick open. This will occur at approximately the same time that the Operations crew begins to steam the generators.

At 1000, Operations should begin steaming both generators. This condition meets the criteria for the following EALs

- Alert - EAL 3.3, "S/G Tube Leak >10 gpm with an Ongoing Steam Release"**
- SAE - EAL 3.4, "Steam Generator Tube Rupture >44 gpm With an Ongoing Steam Release and RCS Activity > 1.0  $\mu\text{Ci/gm}$ , but < 378  $\mu\text{Ci/gm}$  (1% fuel cladding failure)"**

The Shift Manager should declare a Site Area Emergency based upon the following EAL:

**EAL 3.4, "Steam Generator Tube Rupture > 44 gpm with an ongoing steam release and RCS activity > 1.0  $\mu\text{Ci/gm}$ , but < 378  $\mu\text{Ci/gm}$  (1 % fuel cladding failure)"**

Offsite authorities will be notified (NRC notification will be simulated). If not already performed, the ANO Emergency Response Organization will be notified and instructed to respond to their Emergency Response facilities via CNS and plant page.

At 1020, the ESFAS Relay for CIAS, 2K202-A will fail resulting in the closure of the following valves:

- Containment ISO For CCW To RCP Coolers, 2CV-5236-1
- RCP Return Isol, 2CV-5255-1
- CNTMT Chill Water Return, CV-3851-1
- CWCAT CONTNMT Isolation, CV-3852-1

Closure of either 2CV-5236-1 or 2CV-5255-1 will cause loss of Component Cooling Water (CCW) to the Reactor Coolant Pumps (RCPs). Operations will be required to secure all pumps and go to natural circulation. This will cause Operations to steam both generators to perform plant cooldown until CCW cooling can be returned to the RCPs.

When 2CV-5236-1 closes, the limit switch will fail causing Breaker 2B53-E3 to fail. The valve will also fail such that the clutch mechanism will not operate if valve is manipulated manually.

By 1030, the TSC, OSC and EOF should be staffed and operational. The TSC Director or EOF Director should assume responsibility for Command and Control as soon as their facility has the appropriate personnel.

At 1030, Chemistry/Radiation Protection will notify Operations that the reading on sample piping 2TCD-19 is 1900 mR/hr. This will indicate greater than 1% fuel cladding failure. This condition meets the criteria for the following EALs:

- Alert - EAL 1.2, "RCS Activity indicates >1.0% fuel cladding failure"**
- GE - EAL 1.7, "Loss of or challenge to all 3 Fission Product Barriers"**
- NUE - EAL 5.1, "Projected or measured activity at the Site Boundary, averaged over one hour, is greater than or equal to 0.05 mrem/hr TEDE or 0.15 mrem/hr Child Thyroid CDE or Liquid radiological effluents exceed ODCM Limitations"**
- Alert - EAL 5.2, "Projected or measured activity at the Site Boundary, averaged over one hour, is greater than or equal to 0.5 mrem/hr TEDE or 1.5 mrem/hr Child Thyroid CDE or Liquid radiological effluents exceed 10 times ODCM Limitations "**
- SAE - EAL 5.3, "Radiological Effluents are greater than or equal to 50 mrem/hr TEDE or 150 mrem/hr Child Thyroid CDE at the Site Boundary "**
- GE - EAL 5.4, "Radiological Effluents are greater than or equal to 250 mrem/hr TEDE or 500 mrem/hr Child Thyroid CDE at the Site Boundary"**

The EOF Director/TSC Director/Shift Manager should declare a **GENERAL EMERGENCY** based upon the following EAL:

**EAL 1.7, "Loss of or challenge to all 3 fission product barriers"**



The EOF Director/TSC Director/Shift Manager, as a minimum, should make the following Protective Action Recommendation:

**Evacuate 5 mile radius and 10 miles downwind  
The remainder of the EPZ to go indoors**

Offsite authorities will be notified (NRC notification will be simulated). If not already performed, the ANO Emergency Response Organization will be notified and instructed to respond to their Emergency Response facilities via CNS and plant page.

Repair and damage control teams will be briefed and dispatched from the OSC to perform repairs. The following equipment may be considered for repair by the TSC:

- 2K202A relay
- 2PSV-1002
- 2C5A and 2C5B
- Breaker 2B53-E3
- 2CV-5236-1 Operator

The crew will continue to reduce RCS temperature and pressure at ~100°/hour.

At 1230, repairs to 2K202A will be complete allowing Operations to restore cooling to the Reactor Cooling Pumps. At 1300, 2PSV-1002 will be gagged closed stopping the source of the offsite release.

The drill will be terminated once the source of the offsite release is repaired and the objectives for the exercise have been completed.

## DETAILED SCENARIO

(Note: All scenario times are approximate)

TIME	MESSAGE #	Comments
30 min 0715	From Simulator Controller/EP Controller	<b>TURNOVER</b> The operations crew receives a shift turnover, which will present the initial plant conditions.
	To Control Room Staff	
40 min 0745	From	The crew assumes the watch.
	To	
42 min 0747	From	<b>CEA #10 Drop to bottom of core</b> CEA #10 drops into the core. Crew will enter AOP 2203.003, CEA Malfunction, and will begin reducing power to <72%. Crew will notify I&C for troubleshooting and contact Reactor Engineering for fuel assessment.
	To	

IME	MESSAGE #	Comments
5 min 0750	From	<b><u>I&amp;C Arrives at Control Room</u></b>
	To	I&C (Simulator Controller plays part) will report to the Control Room for briefing and then will go to the remote shutdown room.
7 min 0752	From	<b><u>Reactor Engineering to Control Room for Dropped Rod</u></b>
	To	Reactor Engineering arrives in Control Room. See Message 2 for Reactor Engineering actions
19 min 0804	From	<b><u>I&amp;C arrives in Remote Shutdown Room</u></b>
	To	"We have looked at the system. It appears that the ACTM card is bad. We need to place the control rod subgroup on the hold bus to change out the card."

TIME	MESSAGE #	Comments
22 min 0807	From I&C (Simulator Controller)	<b><u>I&amp;C Replaces ACTM Card</u></b> "We have replaced the ACTM card and we are ready to take the control rod subgroup off the hold bus."
	To Shift Manager	Brief with crew and Reactor Engineering and commence control rod recovery.
30 min 0815	From Reactor Eng. Controller	<b><u>Reactor Engineering Assessment</u></b> See Message 5 for Reactor Engineering actions.
	To Shift Manager	
30 min 0815	From	<b><u>RCS Letdown Monitor Rising</u></b> RCS Letdown Monitor, 2RITS-4806 A and B begin to rise.
	To	Shift Manager will request Chemistry to sample RCS for activity.
35 min 0820	From	<b><u>Letdown Monitor Indicating &gt; 1 uCi/cc Iodine</u></b> RCS Letdown Monitor, 2RITS-4806B indicates 1.8E5 cpm.
	To	Crew will enter AOP 2203.020, High Activity in RCS. Shift Manager will request Chemistry to sample RCS for activity. RP coverage will be required for sampling.

TIME	MESSAGE #	Comments	
When requested	6	From Chemistry Controller	<b>Request for Letdown Recommendation</b>
		To Shift Manager	"Leave the letdown flow at the current value until we have more information."
35 min 0830	43	From	<b>RCS ACTIVITY &gt; 0.1% Cladding Failure, NUE Criteria Met</b>
		To	RCS Letdown Monitor, 2RITS-4806B Indicates > 5.5E5 cpm. The Shift Manager will declare a <b>NUE</b> based on the following Emergency Action Level (EAL):  <b>1.1 RCS Activity Indicates &gt; 0.1% Fuel Cladding Failure</b> The SM will direct the Shift Communicator to notify the ADH within 15 minutes of the <b>NUE</b> declaration and notify the NRC immediately thereafter.  No protective action recommendation at this time.  The appropriate personnel will be notified in accordance with procedure 1903.011, "Emergency Response/Notifications".
40 min 0835	7	From Reactor Eng. Controller	<b>Reactor Engineering Assessment</b>
		To Shift Manager	Limit power reduction to approximately 30% per hour.

TIME	MESSAGE #	Comments
50 min 1845	1C	<b>Contingency Message</b> If the Shift Manager has not made the NUE declaration, issue this message.
		Declare the NUE
+1 hr, 0 min 0925	44	<b>Steam Generator Tube Rupture</b> Simulator Controller will insert a 44 gpm tube leak and then ramp to 200 gpm over the next 60 minute interval on Steam Generator "A". When leak is determined, Operations should enter AOP 2202.038, Primary to Secondary Leakage. Operations may call Chemistry for sampling in accordance with Procedure 1604.013, Measurement of Primary to Secondary Leak rate. Shut down rate may increase if unit is in power reduction. NLO should be dispatched to perform Attachment 19 of Procedure 2202.010, Control of Secondary Contamination.
+1 hr, 0 min 0925		<b>Plant Shutdown</b> If not already commenced, Operations will begin to take the plant offline at approximately 30% per hour. Commence power reduction.

TIME	MESSAGE #	Comments
+1 hr, 5 min 0930	From	<b><u>Release via Radwaste Area Vent below ODCM Limits</u></b> Due to primary to secondary leak, activity will trend up on the Radwaste Area Ventilation but will be below ODCM Limits.
	To	Shift Manager may request Chemistry to monitor RDACS
+1 hr, 5 min 0930	From	<b><u>Alert Criteria Met</u></b> SGTR leak rate > 44 gpm Review procedure 1903.010, EAL Classification..
	To	The Shift Manager will declare an <b>ALERT</b> based on the following EAL:  <b>2.2 "RCS Leakage &gt; 44 gpm"</b>  The SM will direct the Shift Communicator to notify the ADH within 15 minutes of the <b>ALERT</b> declaration and notify the NRC immediately thereafter.  No Protective Action Recommendations at this time.  The appropriate personnel will be notified in accordance with procedure 1903.011, "Emergency Response/Notifications".

TIME	MESSAGE #	Comments
+1 hr, 0 min 0935	From	<b><u>Chemist Monitoring RDACS</u></b> RDACS has elevated activity on Channel 5. ODCM limits are not exceeded at this time.
	To	<b>Expected Response</b>
+1 hr, 5 min 0940	From	<b><u>RCS Sample</u></b> "Results from the RCS sample taken at 0840 are 40 uCi/cc I-131."
	To	<b>Expected Response</b>
+2 hr 0945	From	<b><u>Contingency Message</u></b> If the Shift Manager has not made the ALERT declaration, issue this message.
	To	<b>Expected Response</b> Declare an ALERT.
- 2 hr, 0 min 0955	From	<b><u>Reactor Trip</u></b> When steam generator tube leak exceeds 88 gpm, the Shift Manager may elect to manually trip the reactor.
	To	<b>Expected Response</b> Manually trip reactor. Perform Standard Post Trip Actions (SPTA). Enter EOP 2202.004, Steam Generator Tube Rupture.



TIME	MESSAGE #	Comments
+2 hr, 0 min 0955	From	<u>Loss of Condenser Vacuum</u> Condenser Vacuum Pump, 2C-5A will trip.
	To	Expected Response Monitor condenser pressure and prepare to steam to atmosphere.
When patched	From	<u>NLO to Condenser Vacuum Pump, 2C5A</u> "Breaker is tripped. Motor scorched, appears to have overheated."
	To	Expected Response
+2 hr, 5 min 0000	From	<u>Main Steam Safety Valve, 2PSV-1002 Opens and Remains Open</u> At approximately the same time that Operations begins to steam using the upstream atmospheric dump valves, MSSV, 2PSV-1002 will relieve and will fail to seat.
	To	Expected Response May dispatch NLO to valve. Should contact maintenance for support.

TIME	MESSAGE #	Comments
+2 hr, 5 min 0000	From	<b>Steam to Atmosphere, SAE Criteria Met</b>  When Operations begins to steam to atmosphere, EAL 3.4 criteria will be met.  Review procedure 1903.010, EAL Classification.
	To	The EOF Director, TSC Director or Shift Manager will declare a <b>SITE AREA EMERGENCY (SAE)</b> based on the following EAL:  <b>3.4 Steam Generator Tube Rupture &gt; 44 gpm With an Ongoing Steam Release and RCS Activity &gt; 1.0 uCi/gm, but &lt; 378 uCi/gm (1% fuel cladding failure).</b>  The SM will direct the Shift Communicator to notify the ADH within 15 minutes of the <b>SAE</b> declaration and notify the NRC immediately thereafter.  No Protective Action Recommendations at this time.
+2 hr, 0 min 0015	From	<b>PLANT EVACUATION (Not performed)</b>  Controller will issue Shift Manager/TSC Director modified forms for the plant evacuation.
	To	The Shift Manager or TSC Director will perform the appropriate sections of the SAE checklist.

TIME	MESSAGE #	Comments
2 hr, 0 min 015	<b>From</b> Facility Lead Controller	<b>Contingency Message</b> If the SM/TSCD/EOFD has not made the SAE declaration, request the Director to declare a Site Area Emergency.
	<b>To</b> SM, TSCD or EOFD.	Declare a Site Area Emergency.
When patched	<b>From</b> Maintenance Crew at 2C-5A	<b>Maintenance Crew to Condenser Vacuum Pump, 2C-5A</b> <i>"Motor is burned to ground in windings, will take 2-3 hours to install new motor."</i>
	<b>To</b> Shift Manager	
When patched	<b>From</b> NLO at 2PSV- 1002	<b>NLO to Main Steam Safety Valve, 2PSV-1002</b> If NLO is sent to check valve the NLO will report that "Steam is exiting valve. Appears valve is stuck open"
	<b>To</b> Shift Manager	

TIME	MESSAGE #	Comments
+2 hr, 5 min 1020	From	<b><u>2K202-A Relay on Panel 2C-40 Fails</u></b>  2CV-5236-1, 2CV-5255-1, 2CV-3851-1 and 2CV-3852-1 will not operate due to loss of power. This will result in Operations securing all Reactor Coolant Pumps due to lack of cooling.
	To	Expected Response  Secure all RCPs, go to natural circulation.
When batched 12 50	From  Crew Member	<b><u>Burning Smell from failure of 2K202-A Relay</u></b>  "There is a burning smell coming from Panel 2C40."
	To  Crew	Expected Response  Investigate source of smell.
When NLO arrives 20	From  NLO Controller	<b><u>Failure of 2CV-5236-1</u></b>  "Valve will not manually close."
	To  NLO	Expected Response  Report status to Control Room.

TIME	MESSAGE #		Comments
Upon arrival	22	From NLO Controller	<b>Breaker 2B53-E3</b> <i>"Breaker will not reset."</i>
		To NLO	Report status to Control Room.
+2 hr, 5 min 1030	51	From	<b><u>FACILITIES STAFFED</u></b>  TSC, OSC and EOF should be fully staffed and operational. Command and Control will be assumed by either the TSC or EOF Director. The OSC will take over coordination of offsite fire fighting support and the EMT. The Dose Assessment Team will project dose rates and integrated doses offsite.  NOTE: The EOF ENC will not participate in the Exercise. The Alternate ENC is being staged in Little Rock for this exercise.
		To	<b><u>OFFSITE AGENCIES STAFFED</u></b>  Arkansas Department of Health will be staffed at the EOF.
		Expected Response	

TIME	MESSAGE #	Event	Comments
Upon request of data	13	Dose Assessment Controller	<p><b><u>FORECAST DATA</u></b></p> <p>Disregard the forecast you have obtained via procedure. Use the meteorological data provided to you by the Dose Assessment Controller for the duration of the drill.</p>
	To	Dose Assessment Team	Dose Assessment Team will use the forecast data from the scenario.

TIME	MESSAGE #	From	Chemistry	Event	Comments
+3 hr 1045	14				<p><b><u>RCS Activity &gt; 1% Cladding Failure</u></b></p> <p>Chemistry/Radiation Protection sample results indicate &gt; 1% Cladding Failure "The current reading on 2TCD-19 is 1900 mRem/hr."</p>
					<p>The EOF Director/TSC Director/Shift Manager will declare a <b>GENERAL EMERGENCY (GE)</b> based on the following EAL:</p>
					<p><b>1.7 Loss of or challenge to all 3 Fission Product Barriers.</b></p>
					<p>The SM/TSC Director/EOF Director will direct the Notifications Communicator to notify the ADH within 15 minutes of the <b>GE</b> declaration and notify the NRC immediately thereafter.</p>
					<p>The EOF Director/TSC Director/Shift Manager will issue the following <b>Protective Action Recommendation (PAR)</b> to offsite authorities:</p>
					<p><b>EVACUATE 5 mile radius and 10 miles downwind Remainder of the EPZ to go indoors.</b></p>
					<p>The Dose Assessment Team (DAT) will project dose rates and integrated doses offsite. Offsite Monitoring Teams will be dispatched to obtain field measurements.</p>

TIME	MESSAGE #	Comments
+3 hr, 5 min 1100	4C	<p><b>Contingency Message</b></p> <p>If the EOF Director/TSC Director/Shift Manager has not made the <b>GE</b> declaration, issue this message.</p> <p>Declare a General Emergency.</p>
	15	<p><b>Maintenance Crew to MSSV, 2PSV-1002</b></p> <p>Crew will report that "valve is stuck open, will have to be gagged."</p> <p>Commence repairs.</p>
When patched	16	<p><b>Maintenance Crew to 2K202-A</b></p> <p>Crew will report that "Relay is burnt up, must be replaced. Will take 30 minutes to repair."</p> <p>Commence repairs.</p>



TIME	MESSAGE #	Comments
21 When patched	From Maintenance Controller	<u>Maintenance Crew to 2CV-5236-1</u> Crew will report that "Valve will not manually close due to declutch lever shaft key sheared."
	To 2CV-5236-1 Repair Team	Commence repairs.
23 When patched	From Maintenance Controller	<u>Maintenance Crew to 2B53-E3</u> Crew will report that "Thermal overloads are burnt open. Contact block is damaged."
	To 2B53-E3 Repair Team	Commence repairs.
17 When repaired	From Maintenance Crew at 2K202-A	<u>2K202-A repaired</u> "2K202-A has been repaired."
	To OSC Director/Shift Manager	Operations crew will open valves 2CV-5236-1, 2CV-5255-1, 2CV-3851-1 and 2CV-3852-1 if 2K202-A has been repaired and will commence reestablishing cooling water to the RCPs.

TIME	MESSAGE #	Comments
When repaired	24	<p><b>2B53-E3 repaired</b></p> <p>"2B53-E3 has been repaired."</p> <p>Operations crew will open valves 2CV-5236-1, 2CV-5255-1, 2CV-3851-1 and 2CV-3852-1 if 2B53-E3 has been repaired and will commence reestablishing cooling water to the RCPs.</p>
	18	<p><b>2PSV-1002 is gagged</b></p> <p>"2PSV-1002 has been gagged and there is no leakage from the valve"</p> <p>Crew will begin to isolate generator and commence cool down.</p>
+5 hr, 5 min 1300	56	<p><b>RECOVERY PHASE</b></p> <p>All facilities will transition to the recovery phase.</p>
	19	<p><b>DRILL TERMINATION</b></p> <p>After all objectives have been completed, secure drill.</p>

TIME	MESSAGE #			Comments
-5 hr, 0 min 315	From	Lead Drill Controller	Event	<u>POST DRILL CRITIQUE</u>
	To	All Lead Facility Controllers	Expected Response	All ERO facilities will participate in a post drill critique.

**Arkansas Nuclear One 2010 Biennial Exercise  
September 21-22, 2010  
Extent-of-Play (EOP) Agreement  
Between  
The Arkansas Nuclear Planning and Response Program and FEMA Region VI**

**EVALUATION AREA 1**

**Emergency Operations Management**

**Sub-element 1.a – Mobilization**

**INTENT**

This sub-element is derived 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)**

**Locations:**     **State EOC ADEM, Camp Robinson; ADH, Little Rock (ECC only); ADH/SEOF, Russellville; Emergency News Center, Russellville; Alternate Joint Information Center, Little Rock; Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville.**

- EOP:**
- 1.     ANO will notify the ADH ECC per established procedures. The ECC will follow the instructions of the SDO and/or the TOCD.**
  - 2.     Direction and Control will remain with the TOCD who will be pre-deployed to the NP&RP office in Russellville. Alternate JIC personnel will pre-deploy to Freeway Medical Center.**
  - 3.     The FRMTs will be pre-deployed at the NP&RP office in Russellville. After activation, teams will stage at the ANG Armory, Russellville. Two teams will go into the field. FRMTs will be directed from the SEOF.**
  - 4.     ADH, Little Rock will only be evaluated at the ECC.**
  - 5.     No shift change will be performed. A list of second shift Key Personnel will be available for review. A shift change briefing will either be demonstrated by the OROs or the evaluator will interview the ORO to determine the content of the briefing.**
  - 6.     The 1<sup>st</sup> shift may be over staffed for training purposes. Some staff identified on the 2<sup>nd</sup> shift roster will play with the 1<sup>st</sup> team. In an actual emergency this over staffing would not be used.**
  - 7.     Personnel supporting the DCCs out of sequence activities will be alerted and notified at approximately 1800 hours. The DCC controllers will call the County Warning Points to start the notification.**
  - 8.     It is Arkansas policy to issue KI only to Emergency Workers and institutionalized individuals. KI is not issued to the general public.**

9. 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.
10. The quantities of Dosimetry and the quantities and expiration of KI will be confirmed by evaluators at locations identified in plans.

**ARCA: NONE**

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#### **Sub-element 1.b- Facilities**

##### **INTENT**

This sub-element is derived 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)**

**Locations: None**

**EOP: There are no new facilities**

**ARCA: None**

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

##### **INTENT**

This sub-element is derived 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)**

**Locations: State EOC ADEM, Camp Robinson; ADH, Little Rock or Russellville; SEOF, Russellville; Pope County EOC, Russellville; Logan County EOC, Paris; Yell County EOC, Danville; Johnson County EOC, Clarksville.**

- EOP:**
1. ANO will notify the ADH ECC per established procedures. The ECC will follow the instructions of the SDO and/or the TOCD.
  2. Direction and Control will remain with the TOCD who will be pre-deployed to the NP&RP office in Russellville. The ADH will be evaluated at this location and the SEOF.
  3. When the team deploys from the staging area to the SEOF, Direction and Control will be given to the TOCD located in Little Rock until the SEOF is operational.

**ARCA: None**

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## Sub-element 1.d – Communications Equipment

### INTENT

This sub-element is derived 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)**

**Locations:** State EOC ADEM, Camp Robinson; ADH, Little Rock (ECC only); ADH/SEOF, Russellville; State Field Radiological Monitoring Teams (FRMT), Russellville; Emergency News Center, Russellville; Alternate Joint Information Center, Little Rock; Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville.

**EOP:**

1. ADH, Little Rock will only be evaluated at the ECC. (Note: ECC procedures may differ from actions because of pre-staging)
2. Each location will demonstrate the use of one primary and one backup communications system and be prepared to discuss backup alternate communication systems. Each location will identify a communications system that is independent of the commercial telephone system.

**ARCA:** None

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## 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:** State EOC ADEM, Camp Robinson; ADH, Little Rock (ECC only); ADH/SEOF, Russellville; State Field Radiological Monitoring Teams (FRMT), Russellville; Emergency News Center, Russellville; Alternate Joint Information Center, Little Rock; Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville; Yell County Designated Care Center (DCC), Danville; Logan County Designated Care Center (DCC), Paris; Pope County EMS, Russellville; St Mary's Regional Medical Center, Russellville.

**EOP:**

1. ADH. Russellville will only be evaluated at the SEOF.
2. ADH, Little Rock will only be evaluated at the ECC.

3. Exposure control and monitoring will be under the control of ANO at the SEOF, the Russellville ENC, and Russellville Rumor Control. ANO will perform habitability determination using meters and area monitoring. Dosimetry will not routinely be issued to SEOF personnel.
4. It is Arkansas policy to issue KI only to Emergency Workers (EW) and institutionalized individuals. KI is not issued to the general public.
5. If the plume does not require a KI decision, the county EOCs can satisfy this EA by interview.
6. 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.
7. The quantities of Dosimetry and the quantities and expiration of KI will be confirmed by evaluators at locations identified in plans.
8. The availability of TACP equipment will be described through interview at Counties where TACP personnel are deployed.

ARCA: None

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## EVALUATION AREA 2

### Protective Action Decision-Making

#### Sub-element 2.a - Emergency Worker Exposure Control

##### INTENT

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

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

**Criterion 2.a.1: OROs use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including the use of KI, is in place for emergency workers including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. (NUREG-0654, K.4, J.10. e, f)**

**Locations:** ADH/SEOF, Russellville; Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville.

**EOP:** 1. Exposure control and monitoring will be under the control of ANO at SEOF. ANO will perform habitability determination using meters and area monitoring. Dosimetry will be available to deploying personnel when appropriate.

2. **State FRMTs will use gloves as necessary. Access to "anti-C's" will be demonstrated; however, they will not be worn. After the termination of the exercise FMRT members will be prepared to demonstrate the donning and removal of "anti-C's". Respiratory protection will NOT be used.**
3. **At the county EOCs, the RO will demonstrate the EW briefing, record keeping, and procedures for issuing and returning Dosimetry and KI.**
4. **It is Arkansas policy to issue KI only to Emergency Workers (EW) and institutionalized individuals. KI is not issued to the general public.**
5. **If the plume does not require a KI decision, the county EOCs can satisfy this EA by interview.**

**ARCA:           None**

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

**INTENT**

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

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

**Locations:       ADH/SEOF, Russellville.**

**EOP:             Dose Projections will be made per procedures using a combination of RASCAL and RDACS. RASCAL will be the primary model used to make projections based on "plant conditions". Once RDACS outputs are determined to adequately represent the plume, it will be used as the primary model.**

**ARCA:           None**

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

**Locations:** Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County, EOC, Danville.

**EOP:**

1. It is Arkansas policy to issue KI only to Emergency Workers (EW) and institutionalized individuals. KI is not issued to the general public.
2. Use of KI by EWs will be simulated.
3. If the plume does not require a KI decision, the county EOCs can satisfy this EA by interview.
4. The State issues Protective Action Advisories (PAAs) and ANO issues Protective Action Recommendations (PARs). A PAA and/or PAR becomes a PAD when all County Judges concur.

**ARCA:** None

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#### **Sub-element 2.c - Protective Action Decisions Consideration for the Protection of Special Populations**

##### **INTENT**

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

**Criterion 2.c.1: Protective action decisions are made, as appropriate, for special population groups. (NUREG-0654, J.9, J.10.d,e)**

**Locations:** Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville.

**EOP:** Lists and procedures will be demonstrated. Actions will be simulated.

**ARCA:** None

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## 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:** ADH/SEOF, Russellville; State Field Radiological Monitoring Teams (FRMT), Russellville; Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville; Yell County DCC, Danville; Logan County DCC, Paris; Pope County EMS, Russellville; St Mary's Regional Medical Center, Russellville, Dover High School, Dover.

- EOP:**
1. Exposure control and monitoring will be under the control of ANO at SEOF. Dosimetry will be available to deploying personnel when appropriate.
  2. State FRMTs will use gloves as necessary. Access to "anti-C's" will be demonstrated; however, they will not be worn. After the termination of the exercise FMRT members will be prepared to demonstrate the donning and removal of "anti-C's". Respiratory protection will NOT be used.
  3. At the county EOCs, the RO will demonstrate the EW briefing, record keeping, and procedures for issuing and returning Dosimetry and KI.
  4. 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 play is not interrupted.

**ARCA: NONE**

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### Sub-element 3.b – Implementation of KI Decision

#### INTENT

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

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

**Locations:** ADH/SEOF, Russellville; Pope County EOC, Russellville, Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville; State Field Radiological Monitoring Teams (FRMT), Russellville.

**EOP:**

1. It is Arkansas policy to issue KI only to Emergency Workers (EW) and institutionalized individuals. KI is not issued to the general public.
2. Use of KI by EWs will be simulated.
3. If the plume does not require a KI decision, the county EOCs can satisfy this EA by interview.

**ARCA:** None

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

#### INTENT

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

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

**Locations:** Pope County EOC, Russellville; Johnson County EOC, Clarksville; Logan County EOC, Paris; Yell County EOC, Danville.

**EOP:** Lists and procedures will be demonstrated. Actions will be simulated.

**ARCA:** None

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

**Location:** Dover High School, Dover.

- EOP:**
1. The EA will be demonstrated at the Dover High School.
  2. This EA will be demonstrated out-of-sequence on Tuesday, September 21, 2010 at about 0900. At the appropriate time, the controller will give the school administrator the appropriate information as it applies to the school.
  3. The driver will be briefed by the administrator and will receive maps and directions. He will not drive to the DCC. The administrator and driver will be available for interview.
  4. Communications between the school and bus will be verified by a radio check.
  5. Correction-on-the-spot will be considered at this location 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

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

**INTENT**

This sub-element is derived 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)**

**Locations:** Pope County EOC, Russellville; Logan County EOC, Paris; Yell County EOC, Danville; Johnson County EOC, Clarksville.

- EOP:**
1. The RO will issue Dosimetry, KI and brief the Deputy assigned to the T/ACP as appropriate. The Deputy will not drive to the location. The Deputy will talk through the T/ACP, monitoring, and EW exposure control procedures.
  2. 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 play is not interrupted.

**ARCA:** None

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

**Locations:** Pope County EOC, Russellville; Logan County EOC, Paris; Yell County EOC, Danville; Johnson County EOC, Clarksville.

**EOP:** The EOC representative will talk through the procedures that demonstrate the capability to identify and take appropriate actions concerning impediments to evacuation. This discussion will be initiated by a controller input. Actual dispatch of resources will not take place.

**ARCA:** None

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## **EVALUATION AREA 4**

### **Field Measurement And Analysis**

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

##### **INTENT**

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

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

**Criterion 4.a.1: The field teams are equipped to perform field measurements of direct radiation exposure (cloud and ground shine) and to sample airborne radioiodine and particulates. (NUREG-0654, H.10; I.7, 8, 9)**

**Locations:** State FRMT 1, Russellville; State FRMT 2, Russellville.

- EOP:**
1. State FRMTs will follow the ALARA Policy of the Arkansas Department of Health. Teams will not routinely traverse a plume. State Teams will define the edge of the plume. Air Samples will be taken in areas reading near 20 mR/hr or as directed.
  2. Air samples will not be transported to the laboratory.
  3. Charcoal canisters will be used instead of Silver Zeolite. Silver Zeolite canisters will be available for evaluator review.
  4. Air samplers will not be purged.

5. Sealed kits do not have to be inventoried. However, FRMTs can inventory them if they want. FRMTs may be asked to describe all procedures not demonstrated.
6. Two teams will be deployed to the field
7. 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 play is not interrupted.

ARCA: None

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Criterion 4.a.2: Field teams are managed to obtain sufficient information to help characterize the release and to control radiation exposure. (NUREG-0654, H.12; I.8, 11; J.10.a)

Locations: SEOF, Russellville.

- EOP:
1. State FRMTs will follow the ALARA Policy of the Arkansas Department of Health. Teams will not routinely traverse a plume. State Teams will define the edge of the plume. Air samples will be taken in areas reading near 20 mR/hr or as directed.
  2. Air samples will not be transported.
  3. 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 play is not interrupted.

ARCA: None

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

Locations: State FRMT 1, Russellville; State FRMT 2, Russellville.

- EOP:
1. State FRMTs will follow the ALARA Policy of the Arkansas Department of Health. Teams will not routinely traverse a plume. State Teams will define the edge of the plume. Air Samples will be taken in areas reading near 20 mR/hr or as directed.
  2. Air samples will not be transported to the laboratory.
  3. Charcoal canisters will be used instead of Silver Zeolite.
  4. Air samplers will not be purged.
  5. FRMTs may be asked to describe all procedures not demonstrated.

6. **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 play is not interrupted.**

**ARCA:           None**

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## EVALUATION AREA 5

### Emergency Notification and Public Information

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

##### INTENT

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

**Criterion 5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. The initial instructional message to the public must include as a minimum the elements required by current FEMA REP guidance. (10 CFR Part 50, Appendix E.IV.D and NUREG-0654, E.5, 6,7)**

**Locations:       SEOF, Russellville; KXRJ, Russellville; NOAA, NLR.**

**EOP:           1.     *Demonstration of the capability to sequentially alert the public followed by an initial instructional message to populated areas (permanent resident and transient) throughout the 10-mile plume pathway EPZ will be evaluated. The EAS is not used for ANO alert and notification. The alerting is accomplished by the activation of the siren system and the tone on the NOAA radio. The notification is accomplished by the broadcast of the message on the radio station and NOAA radio.***

- a.   *If the Local Government Liaison (LGL) position is staffed at the SEOF when the first PAD is issued requiring activation of the ANS:***

**1) *The activation of the siren system will be demonstrated at the SEOF and the first floor of the Training Center***

**2) *Emergency Messages will be completed by the LGL and provided to the radio station and NOAA for broadcast.***

- b.   *If the LGL position is staffed at the NP&RP offices when the first PAD is issued requiring activation of the ANS:***

**1) *The activation of the siren system will be demonstrated at the NP&RP offices.***

***2) Emergency Messages will be completed by the LGL and provided to the radio station and NOAA for broadcast.***

2. **No sirens will sound and local radio messages and National Oceanic and Atmospheric Administration (NOAA) messages will NOT BE BROADCAST. *The siren activation will be simulated. However, the procedures should be demonstrated up to the point of actual activation.* In Arkansas the County Judge is the decision maker for protective actions. The TOCD only recommends actions. Since the State does the “alert and notification”, the State must wait until the final Judge makes a decision to agree with the recommendation before the “alert and notification” begins.**
3. **Local radio message simulation will be demonstrated at Radio Station KXRJ in Russellville. *Procedures to broadcast the message will be fully demonstrated as they would in an actual emergency up to the point of transmission. Broadcast of the message(s) or test messages is not required.***
4. **NOAA message simulation will be demonstrated at the National Weather Service Forecast Office, North Little Rock. Any real emergency will take precedence. *Procedures to broadcast the message will be fully demonstrated as they would in an actual emergency up to the point of transmission. Broadcast of the message(s) or test messages is not required.***
5. **Route Alerting is not a Primary ANS method. It will not be demonstrated. Backup route alerting will be discussed if appropriate.**

ARCA: None

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

- EOP:
1. **There are no FEMA approved exception areas,**
  - 2, **Backup alert and notification will be in accordance with plans and procedures.**

ARCA: None

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

### **INTENT**

This sub-element is derived 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)**

**Locations:** ADH/SEOF, Russellville; Emergency News Center, Russellville; Alternate Joint Information Center, Little Rock.

### **EOP:**

1. Media kits will be provided by Entergy.
2. Rumor Control activity is staffed by ANO employees IAW Entergy (on-site) plans and procedures.
2. The JIC and Rumor Control will be in Little Rock. They will pre-stage!
3. County Representation at the JIC will be through the ENC Liaison position. County personnel will not be at the JIC.
4. Controller injects for the following questions identified in the Region VI “white paper” will be prepared:
  - a. What protective actions have been ordered?
  - b. Why should the EPZs be evacuated?
  - c. Why should citizens go to the reception center? Can they evacuate to relatives’ or friends’ homes?
  - d. If sheltering is ordered, is it safe?
  - e. What will happen if someone is exposed to radiation? What are the symptoms? What will happen if they are decontaminated?
  - f. Is there a place to put my pets? What should I bring for them?
  - g. How much feed and water should I leave for my livestock? How long will I be gone? How and when will I know if they have been effected by radiation.
  - h. Will prisons and jails be evacuated?
  - i. How are people who can’t evacuate by themselves be taken care of? Who is going to get them?
  - j. Who will notify traffic on rivers and lakes? Who will stop them from going into contaminated areas?

If this subject material is not covered by news releases, press briefings, or other questions; controllers will ask these questions.

**ARCA:** ISSUE NO: 01-08-5.b.1-A-02

## 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 is derived 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)**

**Locations:** Yell County Designated Care Center (DCC), Danville; Logan County Designated Care Center (DCC), Paris

- EOP:**
1. One portal monitor and one side of decon will be set up. A minimum of 6 people and 2 vehicles will go through the reception and monitoring procedures. One person and one vehicle will visit the decon facility. Decon will be simulated, but explained.
  2. Alternate locations for vehicle Decon may be required because of school activities.
  3. This EA will be demonstrated out-of-sequence at both locations on Tuesday, September 21, 2010 at approximately 1830.
  4. Sealed lockers will not be opened unless necessary.
  5. EW procedures will not be demonstrated during this exercise.
  6. Twenty percent of the expected population at Paris is 143. In order to monitor this number in 12 hours; 12 people per hour must be monitored. Since, 1 person can be monitored every 20 seconds using the portal monitors, 180 persons can be monitored per hour. That would require one portal monitor. Since only 1/3 of the required needed to monitor 20 percent is required for demonstration, only one monitor will be set up. The minimum of 6 people will be monitored.
  7. Twenty percent of the expected population at Danville is 1457. In order to monitor this number in 12 hours; 121 people per hour must be monitored. Since, 1 person can be monitored every 20 seconds using the portal monitors, 180 persons can be monitored per hour. That would require one portal monitor. Since only 1/3 of the required needed to monitor 20 percent is required for demonstration, only one monitor will be set up. The minimum of 6 people will be monitored.
  8. Personnel supporting the DCCs out of sequence activities will be alerted and notified at approximately 1800 hours. The DCC controllers will call the County Warning Points to start the notification.

9. **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 play is not interrupted.**

**ARCA: ISSUE NO: 01-06-6.a.1-A-03 (Will be demonstrated during REX-12)**

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#### **Sub-element 6.c - Temporary Care of Evacuees**

##### **INTENT**

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

**Criterion 6.c.1: Managers of congregate care facilities demonstrate that the centers have resources to provide services and accommodations consistent with American Red Cross planning guidelines. (Found in MASS CARE - Preparedness Operations, ARC 3031) Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate prior to entering congregate care facilities. (NUREG-0654, J.10.h, J.12)**

**Locations: Yell County Designated Care Center (DCC), Danville; Logan County Designated Care Center (DCC), Paris.**

- EOP:**
- 1. The DCC shelter manager or designee will be interviewed about DCC activities**
  - 2. An American Red Cross representative will be interviewed (location and time TBD) about Mass Shelters and the American Red Cross plan for converting Care Centers to Mass Shelters.**

**ARCA: None**

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#### **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)**

**Locations: Pope County EMS, Russellville**

- EOP:**
- 1. The EMS will pick up the patient at an Entergy facility. Prior to transfer of patient to the hospital, the EMS will demonstrate monitoring the patient. After patient transfer, the EMS will demonstrate vehicle monitoring. The ambulance will not be draped.**
  - 2. This EA will be demonstrated out-of-sequence on**

or about 0830 on Tuesday, September 21, 2010.

3. *Any real emergency will take precedence.*
4. Correction-on-the-spot will be considered at this location 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

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Locations: St Mary's Regional Medical Center, Russellville.

- EOP:
1. This EA will be demonstrated out-of-sequence on or about 0830 a.m. on Tuesday, September 21, 2010.
  2. *Any real emergency will take precedence.*
  3. Procedures at the hospital do not require draping of halls and entrances.
  - 4, Correction-on-the-spot will be considered at this location 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

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