U.S. Department of Homeland Security
Region VII
9221 Ward Parkway, Suite 300
Kansas City, MO 64114-3372

FEMA

JUL 2 5 2011

Elmo E Collins, Regional Administrator
U.S. Nuclear Regulatory Commission, Region IV
612 East Lamar Blvd., Suite 400
Arlington, Texas 76011-4125

Dear Mr. Collins:

Enclosed is a copy of the final report for the May 11, 2011, exercise of the offsite radiological emergency response plans site-specific to the Callaway Nuclear Power Plant. The state of Missouri and the Missouri counties of Callaway, Montgomery, Gasconade, and Osage participated during the exercise. The report was prepared by the Federal Emergency Management Agency (FEMA) Region VII staff. Copies of the final report will be provided to the state of Missouri.

During the May 11, 2011, exercise No Deficiencies were identified. Three Areas Requiring Corrective Action (ARCAs) were identified as a result of this exercise; however, two were corrected following additional training and re-demonstration and are now closed. One ARCA remains open to be demonstrated during the next biennial exercise.

Based on the results of this exercise, the offsite radiological emergency response plans and preparedness for the state of Missouri and the affected local jurisdictions, site-specific to the Callaway Nuclear Power Plant, can be implemented and are adequate to provide reasonable assurance that appropriate measures can be taken offsite to protect the health and safety of the public in the event of a radiological emergency at the site. Therefore, the Title 44 CFR, Part 350, approval of the offsite radiological emergency response plans and preparedness for the state of Missouri, site-specific to the Callaway Nuclear Power Plant, granted on March 21, 1987, will remain in effect.

If you have questions or concerns regarding the report, please contact Judy Dodgen at (816) 283-7091.

Sincerely,

Beth Freeman

Beth Freeman
Regional Administrator

Enclosure

cc: Vanessa Quinn, HQ REP w/o enclosure
Bill Maier, NRC Region IV w/o enclosure
NRC HQ, Document Control Desk w/enclosure
NRC NSIR, electronic

Callaway Nuclear Power Plant

After Action Report/ Improvement Plan

Exercise Date - May 11, 2011

Radiological Emergency Preparedness (REP) Program

FEMA

Published July 20, 2011

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Callaway Nuclear Power Plant

After Action Report/Improvement Plan

Published July 20, 2011

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EXECUTIVE SUMMARY

On May 11, 2011, the Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA), Region VII, conducted an exercise in the plume pathway emergency planning zone (EPZ) around the Callaway Nuclear Power Plant. In addition, out-of-sequence drills were conducted on March 28, 29, and 31, 2011, and May 12, 2011. The purpose of the exercise and drills was to assess the level of State and local preparedness in responding to a radiological emergency. This exercise was held in accordance with FEMA's policies and guidance concerning the exercise of State and local radiological emergency response plans and procedures.

The previous exercise at this site was conducted on October 20, 2009. The qualifying emergency preparedness exercise for final plan approval was conducted on March 21, 1987.

DHS/FEMA wishes to acknowledge the efforts of the many individuals who participated in this exercise. In the State of Missouri, the counties of Callaway, Gasconade, Montgomery, and Osage participated along with various organizations of the State, County and local governments. The Ameren UE emergency response staff should also be commended for their work on the scenario development and exercise preparation.

Protecting the public health and safety is the full-time job of some of the exercise participants and an additional assigned responsibility for others. Still others have willingly sought this responsibility by volunteering to provide vital emergency services to their communities. Cooperation and teamwork of all the participants was evident during this 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. No Deficiencies were identified. Three Areas Requiring Corrective Action (ARCAs) were identified, as a result of this exercise. Two of the ARCAs were corrected on the spot following additional training and re-demonstration, and are now closed. The remaining ARCA is to be demonstrated during the next biennial exercise. This report contains the evaluation of the biennial full-scale exercise and the out-of-sequence drills.

The final protective action decision (PAD) was the evacuation of portions subareas C1, C4, C5, in Callaway County, M1, M2, in Montgomery County, G1, in Gasconade County and O1, in

Osage County. Approximately a total of 3,064 residents and transients were evacuated (simulated).

SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name
Callaway Nuclear Power Plant

Type of Exercise
Plume

Exercise Date
May 11, 2011

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 Callaway Nuclear Power Plant exercise:

State Jurisdictions

- MO Family Support Division
- MO Department of Social Services
- MO Department of Transportation
- State Emergency Management Agency
- Dept. of Health & Senior Services
- Dept. of Social Services/Family Service
- Dept. of Public Safety
- Dept. of Transportation
- Public Service Commission
- Dept. of Agriculture
- Dept. of Natural Resources
- Dept. of Conservation
- State Highway Patrol
- State Water Patrol
- Missouri National Guard

Risk Jurisdictions

- Callaway County Commissioners
- Callaway County Emergency Management
- Callaway County Sheriff
- Callaway County 911
- Callaway Community Hospital
- Callaway County Ambulance District
- Montgomery County EMS
- Montgomery County Clerk
- Montgomery City Rural Fire Dept
- Montgomery County Health
- Montgomery County Road & Bridge
- Montgomery County Commissioners
- Montgomery County Emergency Management

Montgomery County Sheriff
Gasconade County Emergency Management
Gasconade County Sheriff
Gasconade County Health
Gasconade County Road & Bridge
Gasconade 911 Center
Osage County Commissioners
Osage County Emergency Management
Osage County Sheriff
Osage County Health
Osage County Road & Bridge
Osage County RACES
Osage County Highway Department
Osage County Special Services
Osage County Transportation Officer
Osage County Veterinary Services
Chamois R1 School District

Support Jurisdictions
Columbia Fire Department
University of Missouri
American Red Cross
Couedin-Malinckrodt
KTXY Radio Station

Private Organizations
Ameren UE
Callaway Nuclear Power Plant

Federal Jurisdictions
FEMA Region VII
National Weather Service - St. Louis Mo Forecast Office

SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

Callaway Nuclear Power Plant (CNPP) Emergency Plan describes CNPP's capability to respond effectively to a radiological emergency at the site, and provides a detailed description of CNPP's interaction with Federal, State, and local government agencies and private organizations. The Emergency Plan provides for continuous emergency preparedness including the conduct of an annual exercise and preparatory drills.

The purpose of this exercise is to activate and evaluate portions of the Missouri State Emergency Plan, and the Callaway, Montgomery, Gasconade, and Osage County Emergency Plans, and associated implementing procedures, in accordance with 44 CFR 350. The conduct and evaluation of this drill provides additional training for emergency response organization personnel and a means to further enhance CNPP emergency response capability.

The Scenario Manual was designed to provide the basis for the conduct of a simulated radiological accident scenario at the Callaway Nuclear Power Plant, located near Reform, Missouri, through which the capabilities and effectiveness of the emergency response plans for Callaway Nuclear Power Plant, the State of Missouri, Callaway, Montgomery, Gasconade, and Osage Counties can be evaluated. The Scenario Manual is to be utilized by the Exercise Controllers/Evaluators as the control mechanism for the conduct of the drill.

The scenario was developed by Callaway Nuclear Power Plant. It was initially reviewed by ICF, a FEMA contractor, prior to the final review and approval by FEMA Region VII.

2.2 Exercise Objectives, Capabilities and Activities

Callaway Nuclear Power Plant Emergency Preparedness Exercises and Drills are conducted to test and provide the opportunity to evaluate emergency plans, associated implementing procedures, facilities, and equipment. This exercise tested the CNPP emergency response organization's ability to assess and respond to emergency conditions and coordinate efforts with other agencies for protection of the health and safety of the public.

The scenario, as driven by the CNPP Control Room Simulator, depicted a simulated sequence of events, that resulted in escalating conditions of sufficient magnitude to warrant mobilization

of State and local agencies to respond to the simulated emergency. Whenever practical, the drill incorporated provisions for "free play" on the part of the participants.

The CNPP Emergency Preparedness Exercise & Drill Program objectives are based on the Federal requirements delineated in 44 CFR 350, and State of Missouri, Callaway, Montgomery, Osage, and Gasconade County Radiological Emergency Preparedness plans. Additional guidance provided in NUREG-0654, NUREG-0696, and NUREG-0737, was utilized in developing these objectives.

This Exercise included full participation by the State of Missouri, and Callaway, Montgomery, Osage and Gasconade Counties. A summary of the specific areas to be evaluated for all the participating organizations are listed in Table 3.1.

The overall objective of the Exercise was to evaluate the integrated capability of a major portion of the basic elements existing within the onsite emergency plans and emergency response organizations.

2.3 Scenario Summary

Initial Conditions

The plant is at 100% power and "A" is the Protected Train. The "B" EHC Pump (PCH01B) is tagged out to repair a leak at a fitting on the discharge piping. No other major equipment is out of service. The skies are overcast with wind from 292° at 5 MPH with a stability of D. Temperature is 60 degrees.

The JPIC, All four Counties, and the State of Missouri will be participating in this Exercise. Sentry Messages will be sent to the Counties and State.

Simulator set up to Training Load 10-03.

Narrative Summary
The Scenario is called IC 68

Shortly after the Crew takes the watch a small leak developed in Containment on the "C" loop.

The Shift Manager (SM) will declare an Unusual Event on EAL SU6.1 Unidentified RCS leakage > 25 gpm. The SM and/or the Control Room Communicator will make the notifications.

After the notification for the UE is complete there will be a channel failure of Pressurizer Pressure Transmitter BBPI0456A which will fail high. This will lead to crew actions to select away from this failed instrument if it was originally selected.

Later there will be a failure in the EHC system with a leak at CHV0003 the discharge isolation for the "B" EHC pump (PCH01B). This will cause a turbine trip and a Rx trip signal to be generated. The automatic trip will fail but the RO will be able to trip the Rx manually from the MCB. The Shift Manager will declare an ALERT on EAL SA2.1 and call out the ERO to activate the on Site Emergency Organization. Notifications will be sent to the counties and the state and the ERFs will start to activate.

When the activation of the ERFs is complete there will be indication that the leak in Containment has grown to 250 gpm. If an SI signal was not generated during the RX trip the SI will take place at this time. After the SI the "B" CCW Pump will trip due to a spurious relay operation that causes the trip coil to energize. The EC will recognize that the large RCS leak also meets the threshold for an Alert and a follow up notification will be made.

As the scenario continues there will be a loose parts monitor alarm followed by a rise in RCS activity. If Let Down is in service the crew will see levels on SJRE01 > 25 µci/cc. If Let Down is isolated the indication will some from SDRE0024 at the sample sink. The EC will declare a SITE AREA EMERGENCY on EAL FS1.1 (Loss or Potential Loss of any two barriers). The notifications to the State and EPZ Counties will be made from the EOF.

Alarms on the Area Rad Monitors will show rising Rad levels on the 2000 level of the Aux Bldg. This is from a failed penetration seal (Penetration P-76 CCW from RCPs return) around the 4" pipe. The EC in the TSC should declare a GENERAL EMERGENCY on EAL .FG1.1 (Loss of two barriers and Potential Loss of the third). Notifications should be completed to the Counties and the State. (Note as the leak continues into the Aux Bldg, Rad levels on GTRE0021B will reach values that will support a GE on RG1.2

When the GE notifications are complete there will be a MAGNEM calculation that will extend the PAR out to 5 miles around & 10 miles down wind in sectors EFG. A new PAR notification

will be sent out.

After a period of time the Emergency Team is sent out to stop the leak in the North Piping Pen Room they will report back the leak is stopped. The Team will report that they were able to stop the leak by packing material around the pipe. After this is completed and the crew returns for a debrief, the Exercise can be terminated.

Sequence of Events

Exercise Scenario 5-11-11

Timeline Sequence of Events

Initial Conditions: Initial conditions can be provided at the start of the scenario.

0600 Stabilize Simulator: Establish Exercise conditions in Simulator and verify initial parameters. Perform initial checks. Load 10-3 Reset to IC 68, 100% MOC Password "69236923"

0630 Simulates Morning Meeting for Plant: Established Initial conditions for Exercise with Shift Managers Turnover sheet emailed to EDO & Key Coordinators.

0630 Turnover: Crew walks down MCB and complete briefs.

(0700) Exercise Start

(0710) RCS leak of ~ 30 gpm on "C" Loop in Containment.

(0725) SM Declares Unusual Event on EAL SU6.1 (RCS leak > 25 gpm)

(0740) Plant announcement made and Initial Notifications sent from the Control Room.

(0750) Channel Failure of Pressurizer Pressure Transmitter BBPI0456A which will fail high (Mn Scn #1)

(0810) EHC leak will cause Turbine trip and RX will fail to auto trip. Manual from MCB successful. (Mn Scn #2)

(0825) SM Declares Alert on EAL SA2.1 (RTS failed auto trip) (Mn Scn #3).

(0840) Plant announcement has been made, ERO activation message sent and Initial Notifications sent from the Control Room.

(0855) TSC And EOF activated.

(0925)RCS Leak in Ctmt rises to 250 gpm. If SI did not happen on Rx trip it will take place at this time. Also meets condition for Alert but no escalation.

(0930) Loose Parts Monitor alarm. “C” RCS Loop location.

(0940) RCS activity starts to rise RCS activity >25 µci/ml if L/D available or SDRE0024 > 13R (Malfunction is Fuel Fail).

(0955) EC declares a SAE on EAL FS1.1 (Loss or Potential Loss of two barriers)

1000 ESW leak 2016 CB on piping in overhead. (Mn Scn #4).

(1010) Plant announcement has been made and Initial Notifications sent from the Control Room. TBD Accountability should be simulated

(1030) NB02 has a “B” CCW Pump Brk trip. Relay on breaker face is black and has been very hot (Mn Scn #5).

(1100) Leak in North Piping Penetration Room and ARMs show alarm (Mn Scn #6).

(1115) General Emergency is declared on EAL FG1.1 (Loss of two barriers and Loss or Potential Loss of a third barrier) PARs of 2&5 (Sectors EFG). Depending on timing RG1.2 will also be present and may be bases for GE declaration.

(1130) Plant announcement made and Initial Notifications sent from the EOF

(1130) Lunch

(1230) Dose calculations cause new PAR of 5&10 miles sectors EFG. (insert at quarter hour +2 minutes)

(1245) PARs developed and notifications sent to state and Counties

(1300) After the leak is stopped and E Teams debriefed the Exercise can be terminated.

Total Opportunities (4 Declarations, 2 PARs, 6 Notifications)

SECTION 3: ANALYSIS OF CAPABILITIES

3.1 Exercise Evaluation and Results

Contained in this chapter are the results and findings of evaluation of all jurisdictions and functional entities that participated in the May 11, 2011 Plume Exercise,to test the off-site emergency response capabilities of State and local governments in the 10-mile EPZ surrounding the Callaway Nuclear Power Plant.

Included also are the results and findings of the evaluation of all jurisdictions and functional entities that participated in the out-of-sequence drills and activities on March 28, 29, 31, and May 12, 2011. Those out-of-sequence drills are incorporated into the 2011 sequence and, by extension, this report.

Each functional entity was evaluated on the basis of its demonstration of criteria delineated in "Emergency Preparedness: Exercise Evaluation Methodology" as printed in the Federal Register, September 12, 2001, and April 25, 2002.

3.2 Summary Results of Exercise Evaluation

The matrix presented in Table 3.1, on the following page, presents the status of all exercise criteria from the FEMA Exercise Evaluation Areas and Criteria which were scheduled for demonstration during this exercise, at all participating jurisdictions and functional entities. Exercise criteria are listed by number and the demonstration status of those 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 - Area(s) Requiring Corrective Action (ARCA) assessed or unresolved ARCA(s) from prior exercise(s)

N - Not Demonstrated (Reason explained in sub-section B)

Blank - Not scheduled for demonstration or not assigned to this location/function

Table 3.1 - Summary of Exercise Evaluation (2 pages)

DATE: 2011-05-11 SITE: Callaway Nuclear Power Plant, MO M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		MO State EOC	MO DA/FTC	Missouri Field Tm A	Missouri Field Tm B	MO JIC	MO FCP/EOF	EAS Station - KTXY	Missouri Girls Town	Heanes Recep. Ctr	Callaway Cty EOC	Kingdom Academy
Emergency Operations Management												
Mobilization	1a1	M	M	M	M	M	M			M	M	
Facilities	1b1											
Direction and Control	1c1	M					M			M	M	
Communications Equipment	1d1	M	M	M	M	M	M			M	M	
Equip & Supplies to support operations	1e1	M	M	M	M	M	M		M	M	M	M
Protective Action Decision Making												
Emergency Worker Exposure Control	2a1		M				M				M	
Radiological Assessment and PARs	2b1		M				M					
Decisions for the Plume Phase -PADs	2b2						M				M	
PADs for protection of special populations	2c1						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	M	M	M
Implementation of KI decision	3b1		M	M	M		M		M		M	M
Implementation of protective actions for special populations - EOCs	3c1										M	
Implementation of protective actions for Schools	3c2								M		M	M
Implementation of traffic and access control	3d1	M									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			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						M			M	
Activation of the prompt alert and notification system - Fast Breaker	5a2											
Activation of the prompt alert and notification system - Exception areas	5a3										M	
Emergency information and instructions for the public and the media	5b1	M				M	M	M			M	
Support Operations/Facilities												
Mon / decon of evacuees and emergency workers, and registration of evacuees	6a1									M		
Mon / decon of emergency worker equipment	6b1									M		
Temporary care of evacuees	6c1											
Transportation and treatment of contaminated injured individuals	6d1											

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

DATE: 2011-05-11 SITE: Callaway Nuclear Power Plant, MO M: Met, A: ARCA, D: Deficiency, P: Plan Issue, N: Not Demonstrated		Fulton Nursing Ctr	Callaway Hospital	Callaway Cty Amb.	Churchill Terrace	Presbyterian Manor	Riverview Nursing	Jefferson Lodge	Gasconade Cty EOC	Montgomery EOC	Osage Cty EOC
Emergency Operations Management											
Mobilization	1a1								M	M	M
Facilities	1b1										
Direction and Control	1c1								M	M	M
Communications Equipment	1d1								M	M	M
Equip & Supplies to support operations	1e1	M	M	M	M	M	M	M	M	M	M
Protective Action Decision Making											
Emergency Worker Exposure Control	2a1								M	A	M
Radiological Assessment and PARs	2b1										
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	M	M	M	M	M
Implementation of KI decision	3b1	M		M	M	M	M	M	M	M	M
Implementation of protective actions for special populations - EOCs	3c1	M			M	M	M	M	M	M	M
Implementation of protective actions for Schools	3c2								M	M	M
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										
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								M	M	M
Activation of the prompt alert and notification system - Fast Breaker	5a2										
Activation of the prompt alert and notification system - Exception areas	5a3								M	M	M
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		M	M							

3.3 Criteria Evaluation Summaries

3.3.1 Missouri Jurisdictions

3.3.1.1 Missouri State Emergency Operations Center

The State Emergency Management Agency (SEMA) staff demonstrated an excellent use of the Sentry system. The State displayed good coordinating abilities within SEMA, and with agencies outside the EOC.

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

a. MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 3.d.1, 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

3.3.1.2 Missouri Dose Assessment/Field Team Coordination

This is a team of experienced members who are familiar with their roles and those of the other participating agencies. They worked very well together and were interchangeable with the duties each performed. The team was conscientious about checking with each other to make sure everything they needed to do was completed in a timely manner. They demonstrated good problem solving and were proactive in discussions regarding possible future events.

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

a. MET: 1.a.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 3.a.1, 3.b.1, 4.a.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

3.3.1.3 Missouri Radiological Field Team A

Field Team A displayed excellent team work, communication skills, and was well prepared.

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

a. MET: 1.a.1, 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

3.3.1.4 Missouri Radiological Field Team B

Field Team B displayed excellent team work, communication skills, and was well prepared.

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

a. MET: 1.a.1, 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

3.3.1.5 Missouri Joint Information Center

Communication between Ameren and SEMA was very strong. Collocation of the JIC at SEMA was beneficial. All of the JIC staff worked like "a very well oiled machine".

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

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

3.3.1.6 Missouri Forward Command Post/EOF

Excellent coordination was demonstrated between SEMA, DHSS, and Ameren. All staff members from each of the organizations were very professional and knowledgeable and worked well as a team.

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

a. MET: 1.a.1, 1.c.1, 1.d.1, 1.e.1, 2.a.1, 2.b.1, 2.b.2, 2.c.1, 3.a.1, 3.b.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

3.3.1.7 EAS Station - KTXY

The staff at KTXY Radio Station was very dedicated to performing accurate and timely notifications.

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

a. MET: 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

3.3.2 Risk Jurisdictions

3.3.2.1 Missouri Girls Town

The staff was very knowledgeable of the plan, procedures, and their roles during an incident.

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

a. MET: 1.e.1, 3.a.1, 3.b.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

3.3.2.2 Callaway County/Fulton Emergency Operations Center

Staff did an excellent job in demonstrating implementation of protective action decisions. The facility layout provided for excellent communication between departments and the staff utilized wall maps and displays very effectively.

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

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.c.2, 3.d.1, 3.d.2, 5.a.1, 5.a.3, 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

3.3.2.3 Kingdom Christian Academy

Staff members were very knowledgeable of the plan, procedures, and roles during an incident.

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

a. MET: 1.e.1, 3.a.1, 3.b.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

3.3.2.4 Fulton Nursing and Rehabilitation Center

The staff members were not only committed to the residents in their care, but also committed and knowledgeable of their plans and procedures.Their staff members also demonstrated good knowledge of dosimetry and KI.

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

a. MET: 1.e.1, 3.a.1, 3.b.1, 3.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

3.3.2.5 Churchill Terrace Assisted Living

The staff demonstrated a good basic understanding of their plans and procedures.

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

a. MET: 1.e.1, 3.a.1, 3.b.1, 3.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

3.3.2.6 Presbyterian Manor of Fulton

Staff members demonstrated a good basic understanding of their plan and procedures.

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

a. MET: 1.e.1, 3.a.1, 3.b.1, 3.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 Riverview Nursing Home

The staff members demonstrated good knowledge of their plans and procedures.

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

a. MET: 1.e.1, 3.a.1, 3.b.1, 3.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 Jefferson Lodge of Fulton

The staff was very proactive with their emergency planning.

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

a. MET: 1.e.1, 3.a.1, 3.b.1, 3.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

3.3.2.9 Gasconade County Emergency Operations Center

The staff worked well together as a team. The briefings were thorough and detailed. The EOC leadership demonstrated proactiveness and preparation for potential actions.

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

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.c.2, 3.d.1, 3.d.2, 5.a.1, 5.a.3, 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

3.3.2.10 Montgomery County Emergency Operations Center

Leadership was very strong and proactive for potential actions and needs. The staff worked well as a team and the briefings were thorough and had great detail.

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

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

b. AREAS REQUIRING CORRECTIVE ACTION: 2.a.1.

ISSUE NO.: 10-11-2a1-A-01

CRITERION: OROs use a decision-making process to insure 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 admin or PAGs.

CONDITION: Montgomery County Emergency Operations Center (EOC) staff stated that no emergency workers (EW) would be allowed to exceed the administrative limit of 1 rem, even though the Montgomery County Emergency Response Plan states that "Until environmental samples have been taken and dose assessment has been made, emergency workers will not be allowed to exceed a conservative Administrative Dose Limit of 1 rem, as read on their dosimeters, except for situations involving lifesaving or protection of large populations… authorization for such activities will be made by the Commissioners in the EOC, in consultation with qualified DHSS technical personnel."

POSSIBLE CAUSE: The Montgomery County EOC staff members are not adequately trained on the Montgomery County Emergency Response Plan.

REFERENCE: NUREG-0654, K.4, J.10. e, f; Montgomery County Emergency Response Plan, Annex J, III.E.3

EFFECT: While the scenario did not cause EWs to exceed administrative exposure limits, the EOC staff did not know who should authorize EWs to exceed administrative exposure limits or when EWs could possibly be authorized to exceed administrative limits.

RECOMMENDATION: Montgomery County EOC staff should review the Montgomery County Emergency Response Plan.

SCHEDULE OF CORRECTION: The Missouri State Emergency Management Agency (SEMA) will conduct training to the Montgomery County EOC staff, with special emphasis on radiological exposure limits. This will be demonstrated at the

next biennial Callaway Nuclear Power Plant exercise.

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

3.3.2.11 Osage County Emergency Operations Center

The efficient facility layout of the EOC contributed to effective team work. The Chamois R1 School District, in Chamois, MO voluntarily participated in the evacuation drill. They are to be commended for their dedication and proactiveness.

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

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

3.3.3 Support Jurisdictions

3.3.3.1 Hearnes Reception and Care Center

Many organizations worked together and displayed good team work, positive attitude, excellent contamination control procedures, and strong monitoring techniques.

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

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

ISSUE NO.: 10-11-6a1-A-02

CRITERION: Reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h., K.5.b)

CONDITION: The initial operability check which was performed on the portal monitor was not performed according to the plan. A one microCurie Cs-137 check source was used, and was correctly placed in the center of each detector to be counted. However, the check source was only counted in the centerline once – at approximately chest height. The plan instructs that the source should be counted along the centerline of the portal in several locations to check the sensitivity of the monitor.

POSSIBLE CAUSE: The two emergency workers who were assigned to the portal worked mostly from memory and did not refer to the plan while setting up and preparing to use the portal monitors. At one point they referenced the owner's manual for the portal monitor which is provided by the vendor, but the owner's manual did not have the same instructions for operability checks as the Hearnes Reception and Care Center Plan.

REFERENCE: NUREG 0654, J. 12; FEMA REP 21

EFFECT: By not performing the operability check of the portal monitor with the check source in several different locations along the centerline (e.g., ankle height, waist height, chest height, and head height) to verify that the portal is responding all along the centerline, it is possible that an evacuee with contamination somewhere along their body may not be detected by the portal.

CORRECTIVE ACTION DEMONSTRATED: It was recommended that a job aid be developed for the emergency workers assigned to the portal monitor which lists step-by-step the procedure for setting up and performing operability checks of the portal monitors. The controller provided on-the-spot retraining of the process for operability checks of the portal, and the process was correctly re-demonstrated. Based on the above, this issue is now closed.

ISSUE NO.: 10-11-6a1-A-03

CRITERION: Reception center/emergency worker facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees and/or emergency workers. (NUREG-0654, J.10.h., K.5.b)

CONDITION: The first six evacuees monitored included three individuals who were contaminated and three who were not. The total time it took for the first six evacuees to be monitored with the portal monitor was eight minutes and 34 seconds. This time would not meet the 12 hour time limit requirements of NUREG O654 (J. Protective Response, #12, page 65) to monitor 20% of the total evacuees (3829 estimated evacuees). The evaluator discussed this issue with the controller, and an additional emergency worker was brought over to fill out the initial paperwork and provide instructions to the evacuees instead of having the emergency workers assigned to the portal monitor perform those tasks. Six additional evacuees were then monitored with the portal monitor. None of the six were contaminated for this timed sequence. The monitoring times for these six evacuees were: 15 seconds, 16 seconds, 16 seconds, 15 seconds, 12 seconds, and 11 seconds respectively. The Hearnes Plan estimates 15 seconds monitoring time per evacuee, and the average of these six times meets the 15 second estimation.

POSSIBLE CAUSE: The original process demonstrated with the first six evacuees had the two emergency workers assigned to the portal initiating the paperwork for each evacuee by requesting his/her name and filling out the monitoring form with the name of the evacuee. The emergency workers at the portal then provided instructions to the evacuee on what was going to occur during the portal monitoring process. They also were responsible for changing out the paper on the floor to the portal monitor each time the portal alarmed and assisting the evacuee with donning booties and directing the evacuee to decontamination. The initial monitoring process for evacuees included having the evacuee step backward out of the portal if it should alarm, step off the paper to their left, don booties, and proceed to decontamination. All of this would occur before the next evacuee would be monitored at the portal. In

addition, the evacuees have to stand in the portal for five seconds to be monitored.

REFERENCE: NUREG 0654, J. 12

EFFECT: The two emergency workers assigned to the portal were trying to do too many different tasks and it was slowing down the initial monitoring process.

CORRECTIVE ACTION DEMONSTRATED: After this issue was discussed with the controller, an additional staff member was brought over to work the station. This additional staff member was responsible for filling out the initial information on the forms and providing instructions to the evacuee. This was helpful in assisting the second group of six evacuees in being processed through the portal monitor in a more timely manner. Based on the above this issue is now closed.

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

3.3.3.2 Callaway Community Hospital

The staff that participated in this Medical Service (MS-1) Drill did an excellent job in assessing the contamination of the patient. They demonstrated outstanding knowledge and skills in decontamination.

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

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

3.3.3.3 Callaway County Ambulance District

This team was able to show good knowledge of radiological contamination control concepts, and displayed excellent team work.

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

a. MET: 1.e.1, 3.a.1, 3.b.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

SECTION 4: CONCLUSION

Based on the results of this exercise, the offsite radiological emergency response plans and preparedness for the State of Missouri 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 Missouri site-specific to Callaway Nuclear Power Plant will remain in effect.

APPENDIX A: IMPROVEMENT PLAN

Issue Number: 10-11-2a1-A-01	**Criterion: 2a1**
ISSUE: Montgomery County Emergency Operations Center (EOC) staff stated that no emergency workers (EW) would be allowed to exceed the administrative limit of 1 rem, even though the Montgomery County Emergency Response Plan states that "Until environmental samples have been taken and dose assessment has been made, emergency workers will not be allowed to exceed a conservative Administrative Dose Limit of 1 rem, as read on their dosimeters, except for situations involving lifesaving or protection of large populations… authorization for such activities will be made by the Commissioners in the EOC, in consultation with qualified DHSS technical personnel."	
RECOMMENDATION: Montgomery County EOC staff should review the Montgomery County Emergency Response Plan. SCHEDULE OF CORRECTION: The Missouri State Emergency Management Agency (SEMA) will conduct training to the Montgomery County EOC staff, with special emphasis on radiological exposure limits. This will be demonstrated at the next biennial Callaway Nuclear Power Plant exercise.	
CORRECTIVE ACTION DESCRIPTION:	
CAPABILITY:	PRIMARY RESPONSIBLE AGENCY:
CAPABILITY ELEMENT:	START DATE:
AGENCY POC:	ESTIMATED COMPLETION DATE:

APPENDIX B: EXERCISE TIMELINE

Table 1 on the following pages, indicates the times recorded for various activities and decisions at each of the evaluated locations. A disparity in times is normal given the need for message transmissions and decision-making at the various locales.

The KI time difference of 0845 for Field Teams A & B is due to simulated ingestion of KI before being dispatched.

Table 1 - Exercise Timeline
DATE: 2011-05-11, SITE: Callaway Nuclear Power Plant, MO

Emergency Classification Level or Event	Time Utility Declared	MO State EOC	MO DA/FTC	Missouri Field Tm A	Missouri Field Tm B	MO JIC	MO FCP/EOF
Unusual Event	0714	0722	N/A	0729	0729	0814	0714
Alert	0815	0822	0820	0825	0825	0823	0818
Site Area Emergency	1031	1043	1044	1041	1041	1031	1043
General Emergency	1138	1150	1150	1149	1147	1151	1142
Simulated Rad. Release Started	1135	1150	1135	------	1137	1151	1150
Simulated Rad. Release Terminated	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Facility Declared Operational		0845	0950	------	------	1031	1000
Governor Declared State of Emergency		0822	------	------	------	1148	1148
1st Protective Action Decision: Precautionary: TACP 2 mile radius; stop water traffic on MO river between 125 & 108; close airspace over plant (3 mile radius and below 5k feet); stop rail traffic; place dairy animals on stored feed and water		1055	1055	------	------	1055	1055
1st Siren Activation		1102	------	------	------	1102	1102
Initial EAS Message		1105	------	------	------	1105	1105
2nd Protective Action Decision: Evacuate Sectors E, F, G and 2 mile radius/5 mile downwind / subareas C1, C3, C4, C5, O1		1216	1155	------	------	1216	1216
2nd Siren Activation		1216	------	------	------	1216	1216
2nd EAS Message		1226	------	------	------	1226	1219
3rd Protective Action Decision: Evacuate Sectors E, F, G and 5 mile radius/10 mile downwind / C1, C3, C4, C5, C6, C7, C11, M1, M2, G1, O1		1226		------	------	1226	1226
3rd Siren Activation		1303	------	------	------	1303	1303
3rd EAS Message		1306	------	------	------	1306	1306
KI Recommended to Emergency Workers		1232	1155	0845	0845	1232	1150
Embargo Decision (Final) Ingestion		------	1150	------	------	------	1150
Exercise Terminated		1328	1318	------	------	1328	1318

Table 1 - Exercise Timeline
DATE: 2011-05-11, SITE: Callaway Nuclear Power Plant, MO

Emergency Classification Level or Event	Time Utility Declared	EAS Station - KTXY	Callaway Cty EOC	Gasconade Cty EOC	Montgomery EOC	Osage Cty EOC
Unusual Event	0714	------	0722	0724	0722	0722
Alert	0815	------	0822	0822	0822	0823
Site Area Emergency	1031	------	1043	1043	1044	1043
General Emergency	1138	------	1150	1150	1151	1150
Simulated Rad. Release Started	1135	------	1150	1150	1151	1135
Simulated Rad. Release Terminated	N/A	N/A	N/A	N/A	N/A	N/A
Facility Declared Operational		------	0722	0825	0858	0825
Governor Declared State of Emergency		------	1148	1148	1148	1148
1st Protective Action Decision: Precautionary: TACP 2 mile radius; stop water traffic on MO river between 125 & 108; close airspace over plant (3 mile radius and below 5k feet); stop rail traffic; place dairy animals on stored feed and water		------	1055	1055	1055	1055
1st Siren Activation		------	1102	1102	1102	1102
Initial EAS Message		1106	------	------	------	
2nd Protective Action Decision: Evacuate Sectors E, F, G and 2 mile radius/5 mile downwind / subareas C1, C3, C4, C5, O1		------	1211	1211	1211	1211
2nd Siren Activation		------	1216	1216	1216	1216
2nd EAS Message		1226	------	------	------	
3rd Protective Action Decision: Evacuate Sectors E, F, G and 5 mile radius/10 mile downwind / C1, C3, C4, C5, C6, C7, C11, M1, M2, G1, O1		------	1255	1255	1255	1255
3rd Siren Activation		------	1303	1303	1303	1303
3rd EAS Message		1303	------	------	------	
KI Recommended to Emergency Workers		------	1215	1159	1232	1150
Embargo Decision (Final) Ingestion		------	------	1150	1150	1150
Exercise Terminated		1337	1320	1321	1321	1321

APPENDIX C: EXERCISE EVALUATORS AND TEAM LEADERS

DATE: 2011-05-11, SITE: Callaway Nuclear Power Plant, MO

LOCATION	EVALUATOR	AGENCY
Missouri State Emergency Operations Center	Bridget Ahlgrim *Joe Schulte	HQ REP FEMA VII
Missouri Dose Assessment/Field Team Coordination	*Robert Dye	EPA
Missouri Radiological Field Team A	*Scott Flowerday	FEMA VI
Missouri Radiological Field Team B	*Nan Calhoun	FEMA VI
Missouri Joint Information Center	*Bill Bischof Elsa Lopez	FEMA VI FEMA VI
Missouri Forward Command Post/EOF	Lisa Hamilton *Al Lookabaugh Michael Shuler, Sr.	HQ REP ICF FEMA III
EAS Station - KTXY	*Audie Canida	FEMA VII
Missouri Girls Town	*Joe Schulte	FEMA VII
Callaway County/Fulton Emergency Operations Center	*Jeff Clark Brad Dekorte Laurel Ryan	FEMA VII FEMA VI FEMA VII
Kingdom Christian Academy	*Joe Schulte	FEMA VII
Fulton Nursing and Rehabilitation Center	*Rex Jennings	FEMA VII
Churchill Terrace Assisted Living	*Judy Dodgen	FEMA VII
Presbyterian Manor of Fulton	*Rex Jennings	FEMA VII
Riverview Nursing Home	*Andrew Chancellor	FEMA VII
Jefferson Lodge of Fulton	*Andrew Chancellor	FEMA VII
Gasconade County Emergency Operations Center	*Rex Jennings James McClanahan Robert Neff	FEMA VII ICF FEMA III
Montgomery County Emergency Operations Center	Larry Broockerd Cara Christianson-Riley *Timothy Pflieger	HQ REP FEMA VII FEMA VI
Osage County Emergency Operations Center	John Arszulowicz *Andrew Chancellor David Jeremy	HQ REP FEMA VII HQ REP
Hearnes Reception and Care Center	Audie Canida Cara Christianson-Riley Jeff Clark Rex Jennings *Joe Schulte Kim Steves	FEMA VII FEMA VII FEMA VII FEMA VII FEMA VII Kansas Dept of Health
Callaway Community Hospital	*Jeff Clark	FEMA VII
Callaway County Ambulance District	*Audie Canida	FEMA VII
* Team Leader		

APPENDIX D: ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
ACP	Access Control Points
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
BURS	Back Up Radio System
CANS	Community Alert Network System
CDE	Committed Dose Equivalent
CHO	County Health Officer
CNPP	Callaway Nuclear Power Plant
CTCC	Cremer Therapeutic Community Center
DHS	Department of Homeland Security
DRD	Direct Reading Dosimeter
EAB	Exclusion Area Boundary
EAS	Emergency Alert System
ECC	Emergency Communications Center
ECL	Emergency Classification Level
EMD	Emergency Management Director
EMS	Emergency Medical Services
EOC	Emergency Operation Center
EOF	Emergency Operations Facility
EOP	Emergency Operations Plan
EPZ	Emergency Planning Zone
EW	Emergency Workers
FAA	Federal Aviation Administration
FCP	Forward Command Post
FEMA	Federal Emergency Management Agency
FSD	Family Support Division
FTC	Field Team Coordinator
GAR	Governor's Authorized Representative
GE	General Emergency
GIS	Geographic Information System
JIC	Joint Information Center
JPIC	Joint Public Information Center
LE	Law Enforcement
MSHP	Missouri State Highway Patrol

NWS	National Weather Service
OATS	Owensville Area Transportation Service
OSL	Optically Stimulated Luminescence
PAD	Protective Action Decision
PAR	Protective Action Recommendation
PHO	Public Health Officer
PIO	Public Information Officer
RACES	Radio Amateur Civil Emergency Services
REA	Radiological Emergency Area
REP	Radiological Emergency Preparedness
SAE	Site Area Emergency
SEMA	State Emergency Management Agency
SEOC	State Emergency Operations Center
SNB	Subsequent News Broadcast
SOP	Standard Operating Procedure
TCP	Traffic Control Points
TEDE	Total Effective Dose Equivalent
TL	Team Leader
TLD	Thermo Luminescent Dosimeter
UE	Unusual Event
USCG	United States Coast Guard

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