Ernie Rhodes, Director
Department of Public Safety
State Emergency Management Agency
2302 Militia Drive
Jefferson City, Missouri 65102


Dear Mr. Rhodes,

Enclosed is a copy of the Final After Action Report/Improvement Plan for the Callaway Energy Center Plume and Ingestion Pathway exercise conducted on April 25 & 26, 2017 and associated out of sequence drills conducted from March 7, 2017 through June 6, 2017.

During the April 25 & 26, 2017 exercise and associated drills no findings were identified. There were no findings from the previous exercise.

If you have any questions concerning the above, please contact Dan Kanakares at Daniel.Kanakares@dhs.gov or (816) 283-7016.

Sincerely,

Kathy D. Fields
Acting Regional Administrator

Enclosure

cc: Vanessa Quinn, HQ REP, electronic w/o enclosure
LaShawn Halsey, HQ REP, electronic w/o enclosure
Bill Maier, NRC Region IV, electronic
Gerry Rausch, Ameren, electronic
Greg Voss, MO SEMA, electronic
Keith Henke, MO DHSS, electronic
Callaway Energy Center

After Action Report/ Improvement Plan

Drill Dates - April 25 - 26, 2017

Radiological Emergency Preparedness (REP) Program

Published June 29, 2017
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Callaway Energy Center

After Action Report/Improvement Plan

Published June 29, 2017

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# ACRONYMS AND ABBREVIATIONS

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<tr>
<th>Acronym</th>
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<td>ARCA</td>
<td>Area Requiring Corrective Action</td>
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<td>CDP</td>
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<td>Traffic Access Control Point</td>
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EXECUTIVE SUMMARY

On April 25 & 26, 2017, the Federal Emergency Management Agency (FEMA), Region VII, evaluated a plume and ingestion pathway exercise for the Callaway Energy Center. In addition, out-of-sequence drills were conducted for the Missouri Ingestion Sampling Teams and University of Missouri Nuclear Laboratory on March 7, 2017; Ashbury Heights, Bristol Manor, Fulton Manor, Fulton School District #58, and Saint Peter Parochial School on March 21, 2017; Fulton Medical Center and the Callaway County Emergency Medical Services on April 19, 2017; Fulton State Hospital and Fulton Reception and Diagnostic Center – State Prison on June 6, 2017. The purpose of the exercise and drills was to assess the level of State and local preparedness in responding to a radiological emergency. The exercise and drills were 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 May 5, 2015. The qualifying emergency preparedness exercise for this Power Plant 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 Callaway Energy Center 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 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 demonstrated knowledge of their emergency response plans and procedures and adequately implemented them. No Findings or Planning Issues were identified as a result of this exercise. There were no previous findings identified. This report contains the evaluation of the biennial full-scale exercise.
SECTION 1: EXERCISE OVERVIEW

1.1 Exercise Details

Exercise Name
Callaway Energy Center

Type of Exercise
Drill

Exercise Dates
April 25 & 26, 2017

Program
Department of Homeland Security/FEMA Radiological Emergency Preparedness Program

Scenario Type
Radiological Emergency

1.2 Exercise Planning Team Leadership

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jbassford@ameren.com

1.3 Participating Organizations

Agencies and organizations of the following jurisdictions participated in the Callaway Energy Center exercise and drills:

State Jurisdictions
   Fulton Reception Diagnostic Center – State Prison
   Fulton State Hospital
   Missouri Department of Agriculture
   Missouri Department of Conservation
   Missouri Department of Corrections
   Missouri Department of Health and Senior Services
   Missouri Department of Public Safety
   Missouri Department of Natural Resources
   Missouri Department of Social Services, Family Support Division
   Missouri Department of Transportation
   Missouri Environmental Health and Safety
   Missouri National Guard
   Missouri Public Service Commission
   Missouri School for the Deaf
Missouri State Emergency Management Agency
Missouri State Highway Patrol
Missouri State Public Information Officer
Southeast Missouri Behavioral Health
State Emergency Management Agency (GAR and Assistant)
University of Missouri Research Reactor

County Jurisdictions

Callaway County 911/Communications Dispatch
Callaway County Ambulance District
Callaway County Commission
Callaway County Emergency Management Agency
Callaway County Emergency Medical Services
Callaway County Fire
Callaway County Health Department
Callaway County Road and Bridge Department
Callaway County Sheriff's Department
Callaway County Transportation Department
Callaway Emergency Center RAD Protection Callaway Emergency Center Security
City of Fulton
City of Fulton Police Department
Fulton City Administrator
Fulton Fire Department
Fulton Mayor
Fulton Treatment Center
Gasconade County 911/Communications Dispatch
Gasconade County Clerk’s Office
Gasconade County Commission
Gasconade County Emergency Management Agency
Gasconade County Family Services
Gasconade County Health Department
Gasconade County Sheriff’s Office
Gasconade County Treasurers Office
Gasconade R-1 Schools
Hermann Fire Department
Hermann Police Department
Linn Fire Department
Linn Police Department
Montgomery County Ambulance District
Montgomery County Board of Commissioners
Montgomery County Emergency Management Agency
Montgomery County Developmental Disabilities Assistance Board
Montgomery County Fire Department
Montgomery County Health Department
Montgomery County Road and Bridge Department
North Callaway Fire Protection District
North Callaway R-1 Schools
Osage County 911
Osage County EMS
Osage County Health Department
Osage County R-1 Schools
Osage County Road and Bridges
Osage County Schools
Osage County Sheriff
Osage County Special Service
South Callaway Fire Department
South Callaway R-II Schools

Private Organizations
Fulton Medical Center
Ameren
Calloway Energy Center
American Red Cross
KTXY Radio Station

Federal Jurisdictions
Federal Emergency Management Agency
Food and Drug Administration
National Weather Service - St. Louis
Nuclear Regulatory Commission
United States Department of Agriculture
United States Department of Energy
SECTION 2: EXERCISE DESIGN SUMMARY

2.1 Exercise Purpose and Design

The Callaway Energy Center (CEC) Emergency Plan describes CEC’s capability to respond effectively to a radiological emergency at the site, and provides a detailed description of CEC’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 was 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 exercise provided additional training for emergency response organization personnel and a means to further enhance CEC emergency response capability.

The Scenario Manual was designed to provide the basis for the conduct of an ingestion pathway incident scenario at the Callaway Energy Center, located near Reform, Missouri, through which the capabilities and effectiveness of the emergency response plans for Callaway Energy Center, the State of Missouri, Callaway, Montgomery, Gasconade, and Osage Counties were evaluated. The Scenario Manual was utilized by the Exercise Controllers/Evaluators as the control mechanism for the conduct of the exercise.

The scenario was developed by Ameren with input from the Missouri State Emergency Management Agency and Missouri Department of Health and Senior Services. 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 Energy Center Emergency Preparedness exercise and drills were conducted to test and provide the opportunity to evaluate emergency plans, associated implementing procedures, facilities, and equipment. This exercise tested the CEC 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 CEC Control Room Simulator, depicted a simulated sequence of
events, which resulted in escalating conditions of sufficient magnitude to warrant mobilization operations in accordance with these plans. This objective is further defined by of State and local agencies to respond to the simulated emergency. Whenever practical, the exercise incorporated provisions for “free play” on the part of the participants. These criteria are listed in Table 3.1.

The CEC 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 major portions of the elements existing within the onsite emergency plans and emergency response organizations.

The following was the scenario used for this exercise.

### 2.3 Scenario Summary

Callaway Energy Center is operating at 100% power with no major equipment out of service. The scenario will simulate the effects of several earthquakes.

Shortly after the operating crew assumes the watch (~0735), Annunciators 98D (Operating Basis Earthquake) and 98E (Seismic Recorder On) will be received providing indications of an earthquake. Loss of Cal-Bland and Cal-Loose Creek lines will trip and the Hardened Condensate Storage Tank (HCST) develops a leak (will not be noticed until after the Alert Declaration) as effects from this earthquake. If asked, the Secondary Alarm Station (SAS) operator will confirm that camera movement indicated an Earthquake. If the crew calls either of the Earthquake Information Centers they will confirm an earthquake. An Unusual Event on EAL HU2.1 (Seismic event > OBE as indicated by Seismic Activity, Annunciator 98D) should be classified/declared and the corresponding initial notification completed within 15 minutes after the initial classification/declaration. Per OTO-SG-00001, an inspection of safe shutdown equipment should be performed and a controlled shutdown of the plant to Mode 5 should commence.
At -0745, Callaway County will receive notification that the dam at Glover Spring Lake has suffered a catastrophic failure. The bridge near the lake close to the corner of County Road 101 and Northshore Drive has collapsed from the rushing water of the lake and the bridge over the Crows Fork Creek on State Highway UU was reported that it has dislodged from its foundation.

At ~0805, the Callaway County Emergency Management Director (EMD) will receive a follow up notification that there is flooding on Route O and collapse of a section of road.

At ~0815 during a walk down of the safety systems, the Secondary Operation Technician (OT) discovers a 16 inch crack on the ‘A’ Emergency Diesel Generator (EDG) engine oil sump. An Alert on EAL SA9.1 (The occurrence of any Table S-5 hazardous event AND EITHER: The event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. Or, the event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode) should be classified/declared and the corresponding initial notification completed within 15 minutes after the initial classification/declaration.

By 0900 the Emergency Operations Facility (EOF) and Technical Support Center (TSC) should be activated and taken turnover from the Control Room.

A minor aftershock will be felt at ~0915 causing the following: A re-flash of Annunciator 98D and 98E, a 20 gpm Steam Generator (SG) Tube leak on the 'A' SG, and a small fuel leakage resulting in a slight increase in RCS activity.

The EAL Threshold for SU5.1 (RCS unidentified or pressure boundary leakage > 10 gpm for ≥ 15 min.) will be met at this time. This does not result in an elevated classification but should be recognized by the Control Room/Technical Support Center.

At ~0950, NB02 will trip and the bus will lockout due to a short from the new FLEX connections. Restoration of this bus will be unsuccessful during the remainder of the scenario.

At ~1020, another aftershock will be felt by the station (Re-flash of Annunciator 98D and 98E). A 550 gpm Steam Generator Tube Rupture (SGTR) will develop on the 'A Steam Generator. The leak-rate will exceed the capacity of the charging system with letdown isolated and prompt the Control Room to trip the reactor and enter E-0 (Reactor Trip or Safety Injection). Due to the size of the leak the Control Room should also initiate a Safety Injection (SI). Based on the
SGTR, the Reactor Coolant System (RCS) barrier will be lost (An automatic or manual ECCS (SI) actuation required by SG tube RUPTURE). The 'A' Safety Injection pump fails to start during the SI Actuation due to damage from the tremor (Control power fuses blown with a connection wire losing termination). Repairs to the 'A' SI pump will be successful. At the time of the aftershock, one of the five 'A' Steam Generator Safeties will open ~40% and remain open through the remainder of the scenario causing an RCS leakage outside of containment (Loss of Containment Barrier). Repair, if attempted, will be unsuccessful.

The RCS barrier loss and Loss of Containment barrier results in meeting the threshold for a Site Area Emergency per EAL FS1.1 (loss or potential loss of any two barriers). The Control Room staff will implement the Optimal Recovery Procedures for Steam Generator Tube Rupture (E-3) and Faulted Steam Generator Isolation (E-2).

The Operations crew will commence a cool down to isolate the affected Steam Generator. At ~1145 during the mitigation of the SGTR, several fuel rods fail resulting in increased activity in the RCS.

~1200 while performing the post-accident sampling, a chemistry technician will draw an RCS sample resulting in the sample sink area radiation monitor to alarm. The Chemistry Technician will report that due to the dose rate alarm in the SJ room (Room 1311), the sample does not require analysis per CDP-ZZ-08100 (Post Accident Sampling Guidelines) as the alarm indicated that the Dose Equivalent Iodine (DEI) would exceed 300 μci/cc for the sample (Loss of the Fuel Clad Barrier).

A General Emergency should be declared based on EAL FG1.1 (Loss of any two barriers AND Loss or potential loss of third barrier (Table F-1). The initial PAR associated with the General Emergency Declaration should be to evacuate 2 miles around the plant and evacuate out to 5 miles in the downwind sectors (E, F, and G). The initial Protective Action Recommendation (PAR) will be issued based on the plant condition GE PAR and wind direction. Weather indications are provided to the Emergency Response facilities based on simulated data.

Notifications should be sent to SEMA and the 4 EPZ counties. The drill can be terminated following verification that state/FEMA drill objectives have been met. The drill may also be terminated at the direction of the lead drill controller. Functional Area Critiques and Facility Critiques will begin after drill termination.
SECTION 3: ANALYSIS OF CAPABILITIES

3.1 Drill Evaluation and Results

Contained in this section are the results and findings of the evaluation of the participants in the April 25 & 26, 2017, plume and ingestion pathway exercise and out-of-sequence drills. The exercise and drills tested the emergency response capability of Offsite Response Organizations (OROs) to respond to a radiological emergency.

Each functional entity was evaluated on the basis of its demonstration of criteria contained in FEMA's Radiological Preparedness Program Manual, dated January 2016.

3.2 Summary Results of Drill Evaluation

The matrix presented in Table 3.1, on the following page, presents the status of all exercise criteria scheduled for demonstration during this medical services drill, 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 Findings assessed and no unresolved Findings from prior exercises)
1– Level 1 Finding assessed
2– Level 2 Finding assessed
P - Planning Issues
N - Not Demonstrated
### DATE: 2017-04-25 & 26
SITE: Callaway Energy Center

M: Met, L2: Level 2 Finding, L1: Level, P: Plan Issue, N: Not Demonstrated

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<th>MO DA/FIT</th>
<th>MO RFT A</th>
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Table 3.1 - Summary of Exercise Evaluation (Page 1/2)
DATE: 2017-04-25 & 26  
SITE: Callaway Energy Center

M: Met, L2: Level 2 Finding, L1: Level, P: Plan Issue, N: Not Demonstrated

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Table 3.1 - Summary of Exercise Evaluation (Continued Page 2/2)
3.3 Criteria Evaluation Summaries

3.3.1 Missouri Jurisdictions

3.3.1.1 Missouri State Operations Center

The Missouri State Emergency Operations Center (SEOC), located at 2302 Militia Drive in Jefferson City MO, had twelve state agencies participate in the April 25 & 26, 2017 Callaway Energy Center (CEC) plume and ingestion exercise.

During this exercise, the State of Missouri effectively utilized Position Specific Individual Check sheets for each Emergency Classification Level (ECL) were very effective in providing responders an itemized listing of responsibilities by ECL. There was good coordination between Ameren and Missouri State Emergency Operations Center (SEOC) staff in coordinating briefings to where status updates were provided on common frequencies. Additionally, the direction and control demonstrated at the SEOC was excellent and led to the successful teamwork during the exercise. All criteria at this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.
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.d.1, 5.a.1, 5.b.1.
b.LEVEL 1 FINDINGS: None
c.LEVEL 2 FINDINGS: 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

The Missouri Forward Command Post (FCP) was established in the Callaway Energy Center (CEC) Emergency Operations Facility (EOF) and is co-located with the Emergency Operations Facility, Dose Assessment and Field Team Coordination. Several state agencies report to the FCP to coordinate state activities in response to an event at CEC. The representatives from each of the agencies participating at the FCP demonstrated a thorough knowledge of their respective functions during the April 25 & 26, 2017 Callaway Energy Center (CEC) plume and ingestion exercise.

The Department of Health and Senior Services (DHSS) Team Leader and Dose Assessor reviewed the licensee dose assessment and field team results and investigated differences in the values for Total Effective Dose Equivalent and thyroid Committed Dose Equivalent. Although the differences between the State and licensee dose assessments were within a factor of 10, the DHSS team worked to understand the variances. They determined that the licensee was assuming 100% iodine activity on the air sample particulate filter, whereas the State dose
assessments used the air sample cartridge activity for iodine contribution calculations. All criteria were adequately demonstrated in accordance with plans, procedures, and the extent of play agreement.

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, 2.b.2, 3.a.1, 4.a.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.3 Missouri Joint Information Center

The Missouri Joint Information Center (JIC) for events at CEC was co-located with the Missouri EOC at 2302 Militia Drive, Jefferson City, MO. In addition to the State Public Information Officers (PIOs), Ameren had PIOs report to the JIC. The PIOs demonstrated their knowledge during the April 25 & 26, 2017 Callaway Energy Center (CEC) plume and ingestion exercise. All criteria were adequately demonstrated in accordance with plans, procedures, and the extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.4 Missouri Forward Command Post/EOF

The Missouri Forward Command Post (FCP) was established in the Callaway Energy Center (CEC) Emergency Operations Facility (EOF) and is collocated with the Emergency Operations Facility, Dose Assessment and Field Team Coordination. Several state agencies report to the FCP to coordinate state activities in response to an event at CEC. The representatives from
each of the agencies participating at the FCP demonstrated a thorough knowledge of their respective functions. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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

a. MET: 5.a.1, 5.b.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.5 EAS Station – KTXY

The primary Emergency Alert System (EAS) station for incidents at the Callaway Energy Center (CEC) is KTXY 106.9 FM located at 3215 Lemone Industrial Boulevard, Suite 320, Columbia, MO. KTXY has the capability to receive and broadcast EAS messages 24 hours a day.

An out-of-sequence evaluation was performed on April 20, 2017, by interview. The radio station’s staff displayed knowledge of the CEC procedures and acknowledged the importance of their roles to inform the public. Both criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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

a. MET: 5.a.1, 5.b.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.1.6 National Weather Service

The National Weather Service located at 12 Research Park Drive, Saint Charles, Missouri has the capability to receive and broadcast EAS messages 24 hours a day.
An out-of-sequence evaluation was performed on April 17, 2017, by interview. The radio station’s staff displayed knowledge of the CEC procedures and acknowledged the importance of their roles to inform the public. Both criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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

- **MET:** 5.a.1, 5.b.1.
- **LEVEL 1 FINDINGS:** None
- **LEVEL 2 FINDINGS:** None
- **PLAN ISSUES:** None
- **NOT DEMONSTRATED:** None
- **PRIOR ISSUES - RESOLVED:** None
- **PRIOR ISSUES - UNRESOLVED:** None

### 3.3.1.7 University of Missouri Nuclear Laboratory

The University of Missouri Nuclear Laboratory located at 1513 Research Park Drive, Columbia, Missouri. An out-of-sequence evaluation was performed on March 7, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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

- **MET:** 1.e.1, 3.a.1, 4.c.1.
- **LEVEL 1 FINDINGS:** None
- **LEVEL 2 FINDINGS:** None
- **PLAN ISSUES:** None
- **NOT DEMONSTRATED:** None
- **PRIOR ISSUES - RESOLVED:** None
- **PRIOR ISSUES - UNRESOLVED:** None

### 3.3.2 Risk Jurisdictions

#### 3.3.2.1 Callaway County/Fulton Emergency Operations Center

The Callaway County Emergency Operations Center (EOC) is located at 1201 State Route O in Fulton, Missouri. A number of county agencies accompanied the emergency management staff
During the April 25 & 26, 2017 exercise Callaway County leadership personnel demonstrated the ability to carry out the essential functions required for response. The leadership of the EOC (the County Emergency Manager and the County commissioners) were exceptional in their ability to project forward thinking and future planning for future Protective Actions and then the actual performance of those measures.

The leadership group conducted discussions continuously throughout the exercise looking at the “what if’s” and then laying the groundwork for actions that were required and also could be future requirements or performance objectives/action under a Site Area Emergency and General Emergency. It was obvious that the leadership group was comfortable with each other, skilled and practiced in the execution of their role in the EOC and for all protective 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.d.1, 3.d.2, 3.f.1, 5.a.1, 5.b.1.

b. LEVEL 1 FINDINGS: None

c. LEVEL 2 FINDINGS: None

d. PLAN ISSUES: None

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

g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.2 Fulton Medical Center

The Fulton Medical Center is located at 10 South Hospital Drive, Fulton, Missouri. An out-of-sequence evaluation was performed on April 17, 2017, by demonstration and interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement. The hospital staff worked well as a team and everyone understood their role and responsibilities. There was excellent communication between team members, and with the ambulance crew during the transfer of the patient. The staff used the new procedure checklists to perform their duties. They were knowledgeable in their responsibilities and very aware of monitoring and cross-contamination procedures. They demonstrated proper contamination control procedures throughout the drill.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.3 Fulton Medical Center (Sheltering)

The Fulton Medical Center is located at 10 South Hospital Drive, Fulton, Missouri. An out-of-sequence evaluation was performed on April 17, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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, 6.a.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None
3.3.2.4 Callaway County Medical Service

The Callaway County Medical Service is located at 311 Hickman Avenue, Fulton, Missouri. The ambulance crew was knowledgeable in their duties, and properly followed their new procedures and checklists. They worked well as a team and made medical treatment their primary focus while demonstrating good contamination control procedures at the same time. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.5 Ashbury Heights of Fulton

The Ashbury Heights of Fulton is located at 704 West Chestnut Street, Fulton, Missouri. An out-of-sequence evaluation was performed on March 21, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None
3.3.2.6 Bristol Manor of Fulton

The Bristol Manor of Fulton is located at 750 Sign Painter Road, Fulton, Missouri. An out-of-sequence evaluation was performed on March 21, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.7 Fulton Manor Nursing Home

The Fulton Manor Care Center is located at 520 Manor Drive, Fulton, Missouri. An out-of-sequence evaluation was performed on March 21, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.8 Fulton Reception Diagnostic Center State Prison

The Fulton Reception Diagnostic Center State Prison is located at 1393 Highway O, Fulton, Missouri. An out-of-sequence evaluation was performed on June 6, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.
In summary, the status of DHS/FEMA criteria for this location is as follows:

a. MET: 1.c.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.c.1, 6.d.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.9 Fulton State Hospital

The Fulton State Hospital is located at 600 East 5th Street, Fulton, Missouri. An out-of-sequence evaluation was performed on June 6, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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

a. MET: 1.c.1, 1.d.1, 1.e.1, 3.a.1, 3.b.1, 3.c.1, 6.d.1.
b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
e. NOT DEMONSTRATED: None
f. PRIOR ISSUES - RESOLVED: None
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.10 Fulton Public School District #58

Fulton Public School District #58 Offices are located at 2 Hornet Drive, Fulton, Missouri. An out-of-sequence evaluation was performed on March 21, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None
3.3.2.11 Saint Peter Parochial School

Saint Peter’s Catholic School is located at 700 Highway Z in Fulton, Missouri. An out-of-sequence evaluation was performed on March 21, 2017, by interview. All criteria for this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

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. LEVEL 1 FINDINGS: None
- c. LEVEL 2 FINDINGS: None
- d. PLAN ISSUES: None
- e. NOT DEMONSTRATED: None
- f. PRIOR ISSUES - RESOLVED: None
- g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.12 Gasconade County Emergency Operations Center

The Gasconade County Emergency Operations Center (EOC) is located at 119 East First Street, Hermann, MO. A number of county agencies accompany the emergency management staff in the EOC during emergencies. All criteria at this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

During the April 25 & 26, 2017 exercise, Gasconade County demonstrated strength in the following areas, the Rad Officer gave thorough Emergency Worker Briefings, Law Enforcement staff was knowledgeable of Traffic & Access control Procedures, great EOC participation, especially having School Administrator in EOC, and excellent direction & control briefing conducted every 18 minutes.

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

- a. MET: 1.a.1, 1.e.1, 1.d.1, 1.e.1, 2.a.1, 2.b.2, 2.c.1, 3.a.1, 3.b.1, 3.e.1, 3.d.1, 3.d.2, 3.f.1, 5.a.1, 5.b.1.
- b. LEVEL 1 FINDINGS: None
- c. LEVEL 2 FINDINGS: None
d. PLAN ISSUES: None  
e. NOT DEMONSTRATED: None  
f. PRIOR ISSUES - RESOLVED: None  
g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.13 Montgomery County Emergency Operations Center

The Montgomery County Emergency Operations Center (EOC) is located at 211 East 3rd Street in Montgomery City, MO. A number of county agencies accompany the emergency management staff in the EOC during emergencies. All criteria at this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.

During the April 25 & 26, 2017 exercise, the Montgomery County Emergency Operations Center (EOC) staff demonstrated the performance of their duties and were aided by the minimizing of the full plans down to more user-friendly position checklists. The Montgomery County EOC staff used the Conference Bridge to monitor discussions between other offsite response organizations. However, work should be done to reduce background noise during the Conference Bridge calls. Placing telephones on mute when not speaking would eliminate the problem.

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.d.1, 3.d.2, 3.f.1, 5.a.1, 5.b.1.  
  b. LEVEL 1 FINDINGS: None  
  c. LEVEL 2 FINDINGS: None  
  d. PLAN ISSUES: None  
  e. NOT DEMONSTRATED: None  
  f. PRIOR ISSUES - RESOLVED: None  
  g. PRIOR ISSUES - UNRESOLVED: None

3.3.2.14 Osage County Emergency Operations Center

The Osage County Emergency Operations Center (EOC) is located at 205 East Main Street in Linn, Missouri. A number of county agencies accompany the emergency management staff in the EOC during emergencies. All criteria at this location were adequately demonstrated in accordance with the plans, procedures, and extent of play agreement.
During the April 25 & 26, 2017 exercise, Osage County demonstrated excellent use of new Plans/Procedures implemented effectively. Health Services and Schools Representatives ensured they had accountability for those requiring assistance if and evacuation was required including day care and individuals. Numerous and detailed situational awareness briefings conducted by the EMD were invaluable in ensuring staff possessed the necessary information for an effective emergency response.

Roads and Bridges Representatives monitored major county roads affected by the seismic event and ensured potential evacuation and access for resources were available early on in the event demonstration. Accountability & radiological expose of emergency response personnel by Health and Human Services was a high priority. Communications between all agencies and their ability to plan ahead under the direction of the Emergency Management Director were admirable. Law enforcement agencies had quite a large turnout for the exercise. Everyone played their part as if it were a real incident. Each patrolmen, county deputy and rescue personnel encountered were knowledgeable, professional and dedicated to the mission. Maximum efficiency of Op Center facility/layout.

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.d.1, 3.d.2, 3.f.1, 5.a.1, 5.b.1.

b. LEVEL 1 FINDINGS: None
c. LEVEL 2 FINDINGS: 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 April 25 & 26, 2017, plume and ingestion pathway exercise, associated out of sequence drills, 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, Callaway County, Gasconade County, Montgomery County, and Osage County site-specific to the Callaway Energy Center, will remain in effect.
# APPENDIX A: EXERCISE EVALUATORS AND TEAM LEADERS

**DATE:** 2017-04-25 & 26, **SITE:** Callaway Energy Center, MO  
And Associated Out of Sequence Drills

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>EVALUATOR</th>
<th>AGENCY</th>
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<tbody>
<tr>
<td>Missouri Emergency Operations Center</td>
<td>*Kenneth Wierman</td>
<td>FEMA HQ</td>
</tr>
<tr>
<td>Missouri Dose Assessment/Field Team Coordination</td>
<td>*Jill Leatherman</td>
<td>ICF</td>
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<tr>
<td>Missouri Radiological Field Team A</td>
<td>*Scott Flowerday</td>
<td>FEMA HQ</td>
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<tr>
<td>Missouri Radiological Field Team B</td>
<td>*Chuck Hooper</td>
<td>FEMA VI</td>
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<tr>
<td>Missouri Ingestion Sampling Teams</td>
<td>*Jeff Clark</td>
<td>EPA</td>
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<td>Missouri Joint Information Center</td>
<td>*Joe Suders</td>
<td>FEMA III</td>
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<td>Missouri Forward Command Post/EOF</td>
<td>*Brad Dekorte</td>
<td>FEMA VI</td>
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<td>EAS Station – KTXY</td>
<td>*Daniel Kanakares</td>
<td>FEMA VII</td>
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<td>National Weather Service</td>
<td>*Dennis Branson</td>
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<td>*Daniel Kanakares</td>
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<td>Fulton State Hospital - Psychiatric</td>
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<td>University Of Missouri Nuclear Laboratory</td>
<td>*Paul Ward</td>
<td>FEMA HQ</td>
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<td>Callaway County Emergency Operations Center</td>
<td>*Bill Webb</td>
<td>FEMA X</td>
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<td>*Tina Thomas</td>
<td>FEMA RIII</td>
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<td>Callaway County Emergency Operations Center</td>
<td>*Lee Torres</td>
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<td>*Chris Nemcheck</td>
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<td>*Lisa Rink</td>
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<tr>
<td>Montgomery County Emergency Operations Center</td>
<td>*Michael Shuler</td>
<td>FEMA RIII</td>
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* Team Leader
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