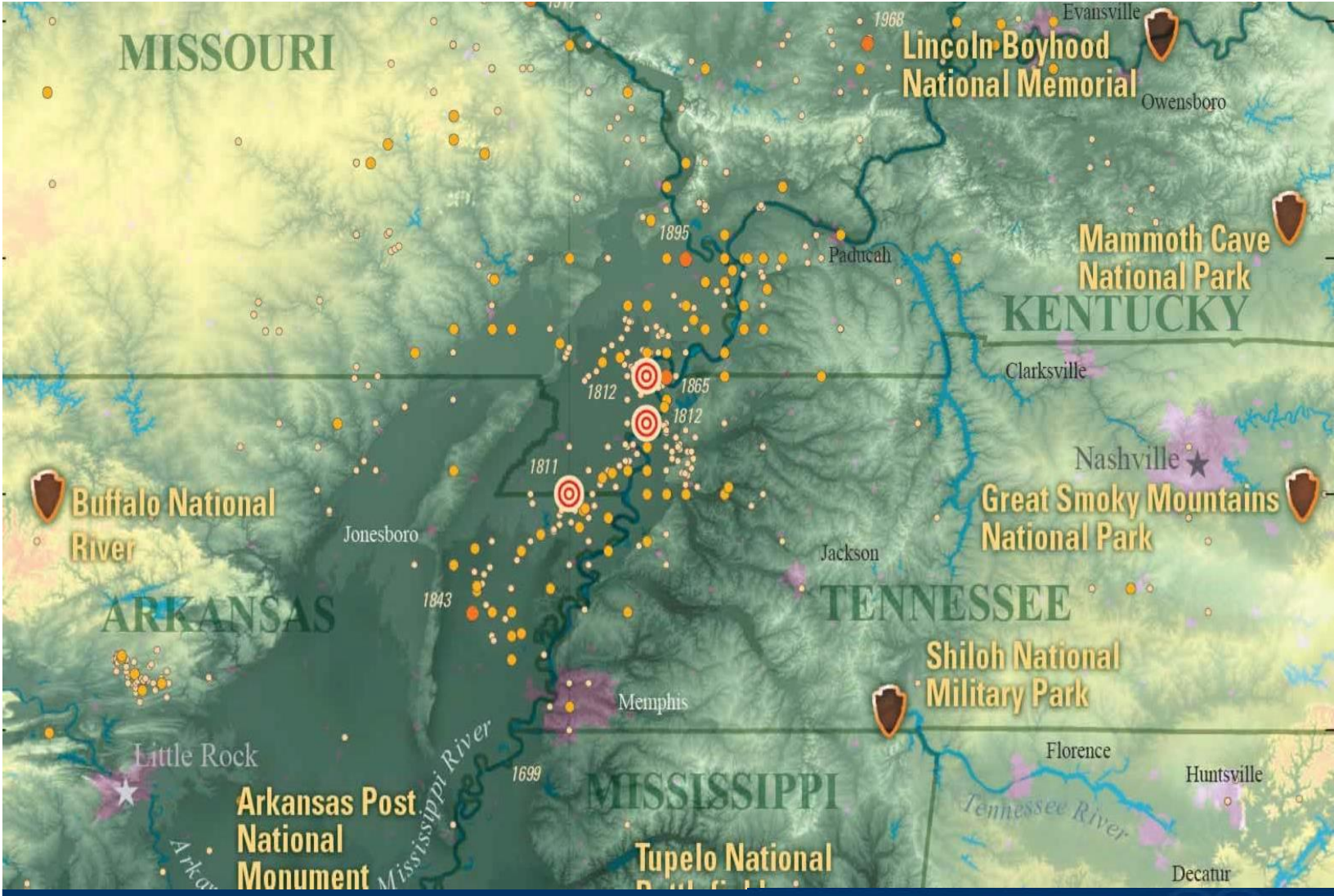

Central United States Earthquake Consortium
New Madrid Seismic Zone

Earthquake Tabletop Exercise

March 20, 2019

After Actions Report

For Official Use Only

NATIONAL EXERCISE PROGRAM

HANDLING INSTRUCTIONS

This document should be handled in accordance with appropriate directives and guidelines as prescribed by the exercise sponsors listed below. Reproduction of this document, in whole or in part, is prohibited without prior approval.

For more information on this exercise, please consult the following points of contact:

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EXERCISE OVERVIEW

Exercise Name	Central United States Earthquake Consortium New Madrid Seismic Zone Tabletop Exercise
Exercise Date	March 20, 2019 – 9 A.M. – 4:00 P.M. (Central Standard Time)
Scope	Participation level: Executive leadership from CUSEC and Member States (State Directors, Planning Chiefs, ESF leads, and Resource Management staff) including Federal supporting partners, private sector. The exercise will be policy focused.
Mission Areas	Protection, Response
Core Capabilities	1. Intelligence and Information Sharing 2. Operational Coordination
Objectives	1. Test information sharing and information integration as well as agreements and relationships established to address energy/fuel prioritization, main supply route command and control, evacuation routes, and state geology resources. 2. Discuss operational reporting, tracking, and management of deployed EMAC resources.
Scenario	The Tabletop Exercise discussion will be centered on a 7.7 magnitude earthquake scenario that occurs near the southern fault line in the New Madrid Seismic Zone. The earthquake causes significant damage throughout the immediate areas northeast and southwest of the epicenter. The earthquake impact areas include Alabama, Arkansas, Indiana, Illinois, Kentucky, Missouri, Mississippi, and Tennessee.
Participating Organizations	See **Appendix A** for a complete list of Participating Organizations**.**
Point of Contact	**Bobby Gillis, MA** Planning Section Supervisor Kentucky Emergency Management 100 Minuteman Pkwy. Frankfort, KY 40601 bobby.j.gillis.nfg@mail.mil **Ted Robinson, MEP** Exercise Program Manager National Exercise Division Federal Emergency Management Agency 400 C Street, SW Washington DC, 20024 teddy.robinson@fema.dhs.gov

GENERAL INFORMATION

Introduction

The New Madrid Seismic Zone (NMSZ) is a series of active faults in a weak spot known as the Reelfoot Rift. It extends 150 miles southward from Cairo, Illinois, to Marked Tree, Arkansas. Large earthquakes estimated 7.0 magnitude—occurred in 1811-1812. There is an average of more than 200 measured events per year with the potential to produce future large earthquakes.

The region of potential impact due to earthquake activity in the NMSZ is comprised of eight states: Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee. Moreover, the Wabash Valley Seismic Zone (WVSZ) in southern Illinois and southeast Indiana and the East Tennessee Seismic Zone in eastern Tennessee and northeastern Alabama constitute significant risk of moderate-to-severe earthquakes throughout the central region of the USA.

The Central United States Earthquake Consortium New Madrid Seismic Zone Tabletop Exercise will examine the ability of the Consortium to effectively respond to a 7.7 magnitude earthquake. The TTX will take place on March 20, 2019 from 9 A.M. to 4 P.M. (Central Standard Time). The exercise will be held in Springfield, IL.

Objectives

The following exercise objectives in Table 1 describe expected outcomes for the CUSEC NMSZ TTX. The objectives are linked to core capabilities, which are distinct critical elements necessary to achieve the specific mission area(s).

Table 1: Exercise Objectives and Core Capabilities

Exercise Objective	Core Capability
1. Test information sharing and information integration as well as agreements and relationships established to address energy/fuel prioritization, main supply route command and control, evacuation routes, and state geologist resources.	▪ Operational Coordination ▪ Intelligence and Information Sharing
2. Discuss operational reporting, tracking, and management of deployed EMAC resources.	▪ Operational Coordination

TABLETOP EXERCISE STRUCTURE

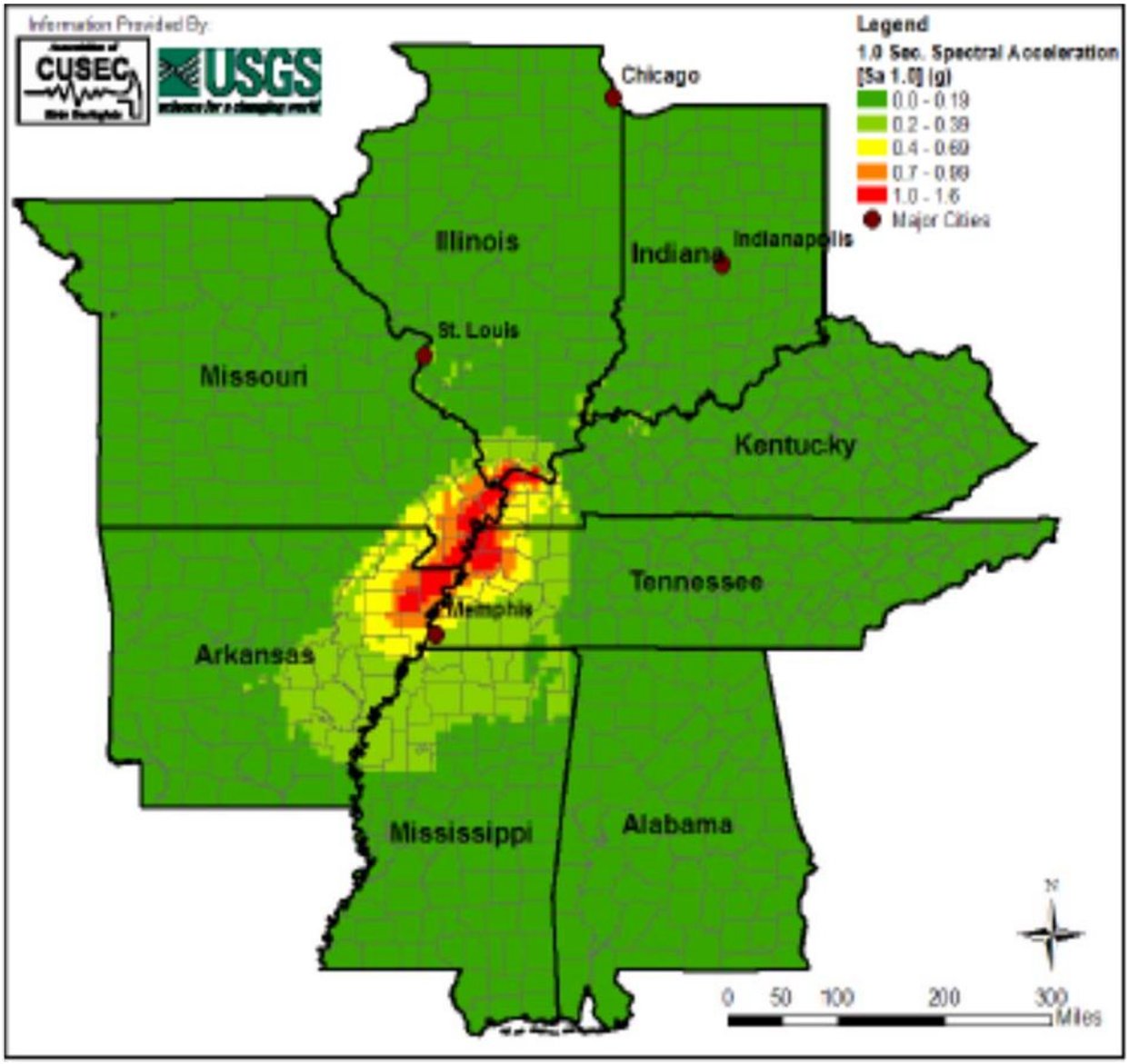
The CUSEC NMSZ TTX consists of five main activities: Two 15-minute Resource Briefings, one 30-minute SituationalAssessment Overview; and two 60-minute Exercise Modules followed by a 15-miunte Hotwash & Summary of Conclusions. The exercise facilitator will provide an overview of the scenario and introduce a video update of the current situation. Players will respond to facilitated discussion questions that are organized according to the exercise session. Discussions should focus on key actions, activities, and decisions that each player would perform given the earthquake scenario conditions.

- **15-minute Resource Brief** by Arkansas Geohazards Supervisor on state geology resources.
- **15-minute Resource Brief** by Kentucky Emergency Management Agency on the funding reimbursement process and Mission Readiness Packages.
- **30-minute Scenario Assessment Overview** will focus on reviewing the Scenario Ground Truth to support decision making.
- **Module One Table Discussion and Plenary** will focus on player response to discussion questions that address exercise Objective 1: *Test information sharing and information integration as well as agreements and relationships established to address energy/fuel prioritization, main supply route command and control, evacuation routes, and state geologist resources.*
- **Module Two Table Discussion and Plenary** will focus on player response to discussion questions that address exercise objective 2: Discuss operational reporting, tracking, and management of deployed EMAC resources.
- **15-Minute Hotwash** to discuss outcomes and achievement of the exercise objectives and exercise design and delivery.

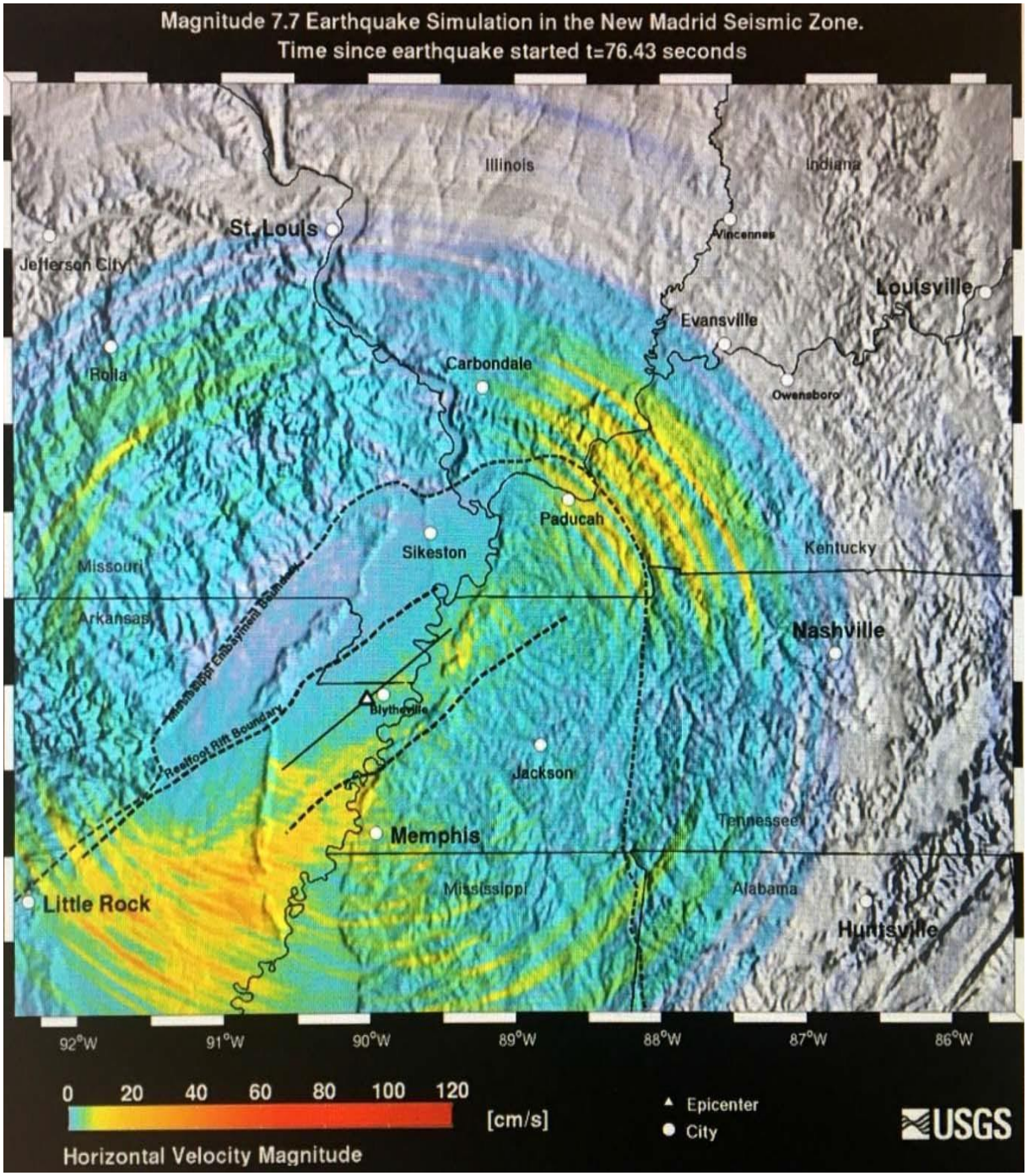
SCENARIO DEVELOPMENT

Opening Scenario

At **0700 a.m. (CST)** on March 20, a magnitude 7.7 earthquake was recorded in the central U.S. region near the southern section of the New Madrid Seismic Zone. The United States Geological Survey is reporting the epicenter appeared to be just southwest of Blytheville, Arkansas and seismic waves traveled outward in all directions. This earthquake produced successive waves of strong ground shaking that began moving along the Reelfoot rift and appeared to be focused northeast toward Paducah, Kentucky and southwest toward Little Rock, Arkansas. The USGS has also reported that the earthquake produced long-period shaking that lasted up to 30-45 seconds in some areas, including Memphis, Little Rock, and Paducah.



Magnitude 7.7 Earthquake Occur in New Madrid Seismic Zone



Earthquake Seismic Waves at New Madrid March 20, USGS

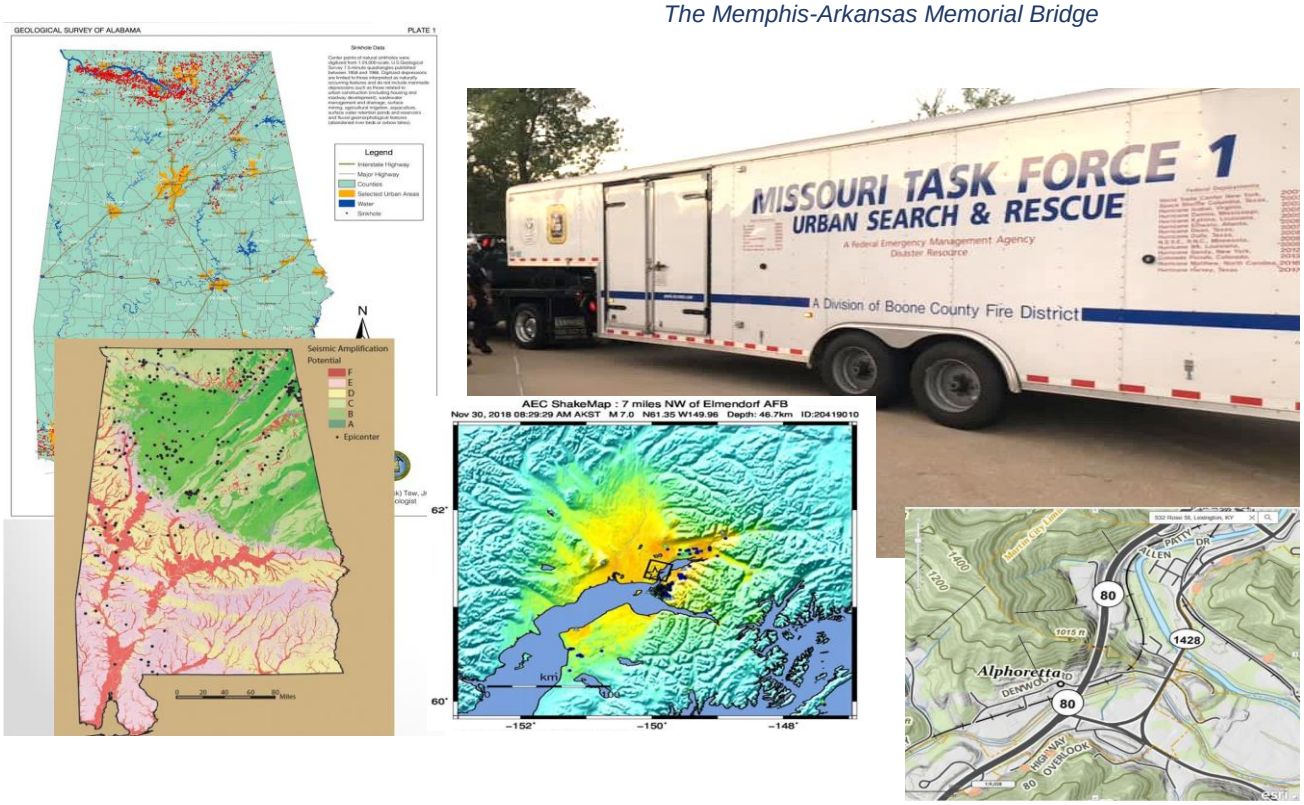
MODULE 1: SCENARIO UPDATE

Scenario

It has been 24 hours since a magnitude 7.7 earthquake rocked the area within the New Madrid Seismic Zone. Significant damage has been reported within a 420-mile area from Little Rock, Arkansas north to Evansville, Indiana.

Initial priority focus is on life-saving measures, search and rescue, medical evacuation, ruptured gas lines, down live power lines, fire suppression, hazardous materials and chemicals, etc.

The Memphis-Arkansas Memorial Bridge



Geology Resources and Products

OBSERVATIONS

The following observations reflect strengths and opportunities for improvement captured by observers, evaluators, note-taker and facilitator.

OBJECTIVE 1: Test information sharing and information integration as well as agreements and relationships established to address energy/fuel prioritization, main supply route command and control, evacuation routes, and state geology resources**.**

CORE CAPABILITY:

- Intelligence and Information Sharing
- Operational Coordination

STRENGTHS

S1: Effective utilization of pre-determined primary and secondary routes, and supply drop-off locations

Multiple states highlighted the importance of pre-determined transportation routes, and how the identification of such routes will enable the deployment of responders and resources following an earthquake, despite damage to the transportation infrastructure.

- Indiana has established priority and secondary routes that would be used in the event of an earthquake. These predesignated routes will be used by all response resources and to determine the status of other viable routes of entry and egress.
- Teams conducting damage assessments will also monitor avenues of egress and talk with survivors who self-evacuate about traveled road conditions.
- The Kentucky Transportation cabinet has developed a dashboard for the identification and monitoring of alternate transportation routes.
- Arkansas has a team that is ready to deploy to work through the assessment. They use pre-identified primary and secondary routes that would have little or no damage based on predictive geological data.
- The Corps of Engineers met previously to discuss bridges and overpasses that would be affected along the Missouri River and have identified pre-determined locations that could serves as fuel distribution points.
- Air assets will be used to identify viable supply routes.
- Ground assessments of route status will continue after the initial earthquake due to the reoccurrence of aftershocks. United States Geological Survey (USGS) data predicts many aftershocks will occur causing additional significant damage to the transportation infrastructure.

S2: Readily available USGS resources and data for rapid response

United States Geological Survey have multiple resources and terabytes of valuable and relevant data regarding the CUSEC New Madrid Seismic Zone that can benefit the whole community of responders and planners involved in response efforts. These resources and data are readily available to guide and support training exercises as well as real-world response efforts following an earthquake.

- United States Geological Survey provides initial estimates of projected damaged areas to include maps and other data that can be shared with Emergency Operation Centers (EOC) to support decision making.
- United States Geological Survey provides predictive analysis on bridges, landslides and waterways that can directly contribute to improving response efforts.
- Current collaboration exists between state geologists, University of Memphis & Center for Earthquake Research Information (CERI) and CUSEC member states.
- Geological Survey capabilities are already included under Emergency Support Function 5 (ESF-5) and provide critical information for supporting:
    - A Common operating Picture
    - Situational Awareness
    - Common Operational Data
    - Planning Support for all phases of response and recovery efforts

S3: Preparedness planning and response partnerships with the private sector

Multiple states discussed their strong relationships with private sector organizations, to include integrating the private sector within EOCs and emergency operations plans.

- The Illinois State Emergency Operations Center (SEOC) acknowledged that the private sector has their own login credentials to WebEOC, so they are able to share immediate information. This supports their ability to share and receive planning and task actions.
- Some Fusion Centers have someone dedicated to monitor their "public safety room" for all EMS, fire, police, and other emergency response actions. They utilize "open rooms" (adobe connect) during a disaster for communication among agencies and organizations involved. This approach facilitates the promotion of a common operating picture and consistent updates.
- Private sector partners are included in many areas of planning and response operations as a normal part of the process. These established relationships support open lines of communication for resource coordination.
- Arkansas has pre-identified Walmart as a response location that would be stood up in a disaster. Additionally, they have worked with airports to create communication plans during response operations.
- Healthcare systems in 23 counties in southern Illinois continue to discuss the priority of fuel for generators and medical supplies. A group of private pilots created a Non-Governmental Organization (NGO) who currently work with healthcare facilities to coordinate the air deliver of medical supplies in the event of a disaster.

S4: Pre-determined fuel agreements to expedite processes

Multiple agreements and processes are in place throughout the regions to expedite regular processes, allowing for rapid fuel distribution.

- Region VII has Defense Logistics Agency (DLA) fuel partnerships with six identified locations for fuel delivery.
- During response, the Department of Energy (DOE) would lead communication and coordination efforts with the private sector to establish a common operating picture for what fuel stations are

operational within the first 24 hours of response operations.

- Multiple Regions are aware that the Environmental Protection Agency (EPA) will waive some requirements for fuel distribution during disaster response efforts.

OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement #1: Difficulty establishing a common means of communication for multiple regions, states, local governments, and private sector to work together and share information during response

The various WebEOCs cannot update and coordinate with other systems, and challenges exist with disseminating incident and response information across multiple regions and states.

- Indiana uses WebEOC and ArcGIS, but they do not have the capabilities for state-to-state coordination under one common operating software platform during a multi-state disaster.
- Region IV states WebEOC is a big pull process but wish it could be more of a push tool (pushing out data).
  - Recommendation #1: Kentucky could first identify which systems are still functional after an event. Once identified, they rely on fuel-instant tools that feed right into WebEOC, and then use these tools to pull information into WebEOC, expediting the fuel-readiness process.
  - Recommendation #2: Missouri National Guard Bureau (NGB) utilizes Liaison Officers (LNOs) as reliable sources at various agencies. They serve as valuable assets for communicating across multiple agencies.

Opportunity for Improvement #2: No common operating picture for the distribution of fuel

Fuel is vital for the continuation of operations during a disaster, and the various regions and states within the New Madrid Seismic Zone do not have a common operating picture for the prioritizing and distribution of fuel throughout the Nation.

- Within the first few weeks, fuel will still be readily available, but the challenge will be getting it to the affected areas.
- Water pumps are a major priority that are often overlooked, and regions will be faced with thousands of small water entities. Water will remain a high priority and will be needed to operate sterilization pumps used to sterilize medical equipment for hospitals.
- Kentucky Emergency Management, in partnership with the Kentucky Energy and Environment Cabinet, is establishing relationships with the fuel industry to improve information sharing procedures and enhance situational awareness regarding fuel status.
- Missouri National Guard have established relationships with private sector partners that may fall outside of the geographically affected areas. These relationships will provide the Guard the capability for continued access to fuel supplies. Currently, the need exists for a process to coordinate private sector and National Guard actions.
- The fuel impact is expected to affect the entire nation. There are hundreds of truck drivers from other states that can volunteer to assist other states in transporting fuel. There are certifications that need to be given in order for truck drivers to work for other states. The process as currently administered may contribute to untimely delays in ground fuel transport.
  - Recommendation #1: Ben Bolton shared that the state of Tennessee has a petroleum contingency plan that they would implement to trigger voluntary and involuntary fuel

distribution in accordance with approved laws. Other states could adapt the same approach.

MODULE 2: SCENARIO UPDATE

Module 2: Scenario Update

It has been 72 hours since the magnitude 7.7 earthquake occurred in the area within the New Madrid Seismic Zone. Urban Search and Rescue Teams and other resources have arrived and continue to deploy throughout the impacted areas. Missouri, Arkansas, Tennessee, and Kentucky have requested EMAC A-Teams be deployed to their states. FEMA/DHS has requested a National EMAC Liaison Team (NELT). FEMA/DHS has also requested a Regional EMAC Liaison Team (RELT) in Region IV. Several main supply routes and evacuation routes have been cleared. Air transport of resources to established staging areas are also underway.

State disaster response resources in Missouri, Arkansas, Tennessee, and Kentucky are exhausted due to the widespread geographic impact of the earthquake and are not available to support EMAC requests outside of their state.

Emergency Management Assistance Compact (EMAC) Overview

Greg Shanks from Kentucky Emergency Management provided an overview of key EMAC concepts and highlighted how EMAC could be used within the given exercise scenario. Participants of the New Madrid Seismic Zone exercise provided their input regarding the EMAC, including best practices they have found.

OBSERVATIONS

The following observations reflect key considerations and findings captured by observers, evaluators, the note-taker and facilitator.

Objective 2: Discuss operational reporting, tracking, and management of deployed Emergency Management Assistance Compact (EMAC) resources.

Core Capability:

- Operational Coordination

Key Considerations and Findings

Key Consideration #1: Resource requesting through the EMAC

- The EMAC process: EMAC is implemented through the State Emergency Management Agencies (State EMAs) within the Member States on behalf of their respective Governors. The EMAC Operations System (EOS) facilitates all phases of the EMAC Process.
  - **Activation:** When local resources are exhausted and resource requests reach the State Emergency Management Agency, the state sources the resource needs. That State's Governor will declare an emergency or disaster, authorizing funds to be expended for response and recovery and activating EMAC. Only the affected state needs to declare an emergency or disaster.
  - **Request and Offer:** The affected state will route resource requests to the EMAC A-Team who, in turn, will contact EMAC Member States to source the request starting with the closest states (time/distance). The Requesting and Assisting State Emergency Management Agencies complete the EMAC Request for Assistance Form (REQ-A) for accepted offers of assistance. The completed REQ-A constitutes a legally binding agreement between the two states. The A-Team facilitates the EMAC Process under the direction and control of the EMAC Authorized Representatives of the Requesting and Assisting States. The EMAC operating system will generate a legally binding agreement (estimated in cost) – there are 13 governing articles ratified in all 50 states – deployment briefings, then the mission begins
  - **Response:** Once the REQ-A is complete resources prepare to Mobilize (prepare for their mission), Deploy (conduct the mission in the Requesting State), and Demobilize (return home).
  - **Mission Ready Packages:** Mission Ready Packages are specific response and recovery capabilities that are organized, developed, trained, and exercised prior to an emergency or disaster. They are based on National Incident Management System (NIMS) resource typing but take the concept one step further by considering the mission, limitations that might impact the mission, required support, the footprint of the space needed to stage and complete the mission, personnel assigned to the mission, and the estimated cost.

Key Findings

- Region VI agreement – Interstate Emergency Response Support Plan (IERSP) is used to speed up the EMAC request response.
- It is very important to be as clear and concise as possible during the EMAC process in order to expedite the process and avoid delays.

Key Consideration #2: Resource tracking through the EMAC

- It is the responsibility of each state to track requested resources through daily reporting. Each state can determine how they track and collect the data as well as the specificity of the data being collected.
- Agreed upon resources maybe sent before the official written agreement is completed. An agreement must be confirmed in writing within 30 days of the start of the deployment.
- A verbal agreement between EMAC Authorized Representatives is acceptable but these verbal agreements should always be followed up with documentation.

Key Consideration #3: Effect on resource requests and sourcing due to a disaster causing geographically dispersed damage

- In the event of a New Madrid Seismic Zone event, response and staging efforts will require assistance beyond neighboring states. EMAC states must be prepared to coordinate beyond their local regions.

Key Findings

- It is important to have a partnership with Federal agencies. This can be accomplished through EMAC Liaison Teams embedded within the National Response Coordinating Center (NRCC) and Regional Response Coordinating Centers (RRCC) to facilitate communications.
- EMAC doesn't work directly with the private sector but it can utilize those partners. Legally, private sector can be used under EMAC as long as the Assisting State has a mechanism in place to make them "Agents of the State". This can be done under a separate MOA/MOU.

Key Consideration #4: Command and Control of EMAC resources

- The requesting jurisdiction has operational command and control of requested resources. If there is an incident within the state providing the resources, the resources can be recalled.

Key Consideration #5: EMAC reimbursement

- The EMAC Special Assignment Task Force is working with states to improve the reimbursement process. Currently, there is no standardized reimbursement form. EMAC is working towards a standardized version that will be implemented nationwide. States are working to identify their gaps in managing the reimbursement process.
- The standard reimbursement process is 45 days, which is not practical timeline. One thing that needs to be done is to push along the resource providers because they are the first step in a multi-step process for reimbursement.
- Once that is done, the reimbursement claim goes to the Requesting State, it is audited, and then paid to the Requesting State.
- Written host-state agreements to shelter evacuees are critical to success. Efforts are currently underway between some CUSEC member states to create and finalize host-state agreements.

Key Findings

- Requesting States did not always immediately communicate their required reimbursement criteria upfront resulting in delayed information sharing. This demonstrated the importance of ensuring this information is shared with all party states upfront.
- A standardized form across all of the states is being created and resembles the standard FEMA

Summary Form.

- It is critically important to have full visibility of all resources entering and leaving the state. Having an accurate operating picture will ensure resource prioritization is correct.

APPENDIX A: PARTICIPATING AGENCIES

ORGANIZATION	REPRESENTATIVE	ROLE/SECTOR
Alabama Department of Economic and Community Affairs	Emergency Management Coordinator	State Emergency Management
Alabama Power Company	Power Delivery Storm Center Director	Other
American Red Cross	State Emergency Management Liaison	ESF Representative
Arkansas Department of Emergency Management	Response & Recovery Division Director	State Emergency Management
Arkansas Department of Transportation	Staff Maintenance Engineer	ESF Representative
Arkansas Geological Survey	Geology Supervisor	State Geological Survey
CUSEC	Associate Director	Other
CUSEC	Executive Director	Other
Dept. of Energy	ESF12 Region IV Regional Coordinator	Dept. of Energy
DHS	NG Military Advisor	Other
DHS / FEMA	Regional Administrator	FEMA
DHS/FEMA R-IV	Plans Chief	FEMA
DNR/MGS	Division Director	State Geological Survey
DNR/MGS	Chief, Geologic Resources Section	State Geological Survey
Federal Highway Administration	ER Coordinator/Bridge Engineer	ESF Representative
FEMA	National Exercise Division	FEMA
FEMA Exercise Branch	Support	FEMA
FEMA Exercise Branch		FEMA
FEMA Exercise Branch	Lead Support to Shaken Fury 2019	FEMA
FEMA NED	Exercise Program Manager	FEMA
FEMA Region 7	Earthquake Program Manager	FEMA
FEMA Region V	Response Division Director	FEMA
FEMA Region V	Operational Planner	FEMA
FEMA RVII	REO	FEMA
G&H International, Inc.	Support for DHS S&T	Other
IEMA	Exercise Officer	State Emergency Management
IEMA-DOIT	GIS Specialist	State Emergency Management
IL Emergency Management Agency	Manager, Applications Development and GIS	State Emergency Management
Illinois Emergency Management Agency	Exercise Planner	State Emergency Management
Illinois National Guard	Interagency and Intergovernmental Liaison to IEMA	State National Guard
Illinois National Guard	BG, Dir. of Joint Staff	State National Guard
Indiana Geological and Water Survey	Outreach Coordinator	State Geological Survey

INDOT	Dir. Emergency Planning & Response	ESF Representative
Kentucky Emergency Management	Director	State Emergency Management
Kentucky National Guard	Director of Joint Staff	State National Guard
KYEM	Ops & Planning Chief	State Emergency Management
KYEM	Assistant Director of Operations	State Emergency Management
KYEM	Planning Section Supervisor	State Emergency Management
KYEM		State Emergency Management
KYNG	Director of Military Support	State National Guard
MABAS-IL	Operations Branch Chief	Other
MABAS-IL	SEOC LNO	Other
MABAS-Illinois	Deputy Operations Branch Chief	ESF Representative
MABAS-Illinois	Operations Branch Chief	Other
Missouri National Guard	Chief, Plans and Exercises	State National Guard
Mutual Aid Box Alarm System (MABAS)	Operations Branch Chief	Other
Shawnee Preparedness and Response Coalition	President	ESF Representative
South Carolina Emergency Management Division	Operational Planner	State Emergency Management
TEMA	Exercise Specialist	State Emergency Management
TEMA		State Emergency Management
US Army Corps of Engineers, Memphis District	Emergency Management	Other
USASMDC/NGB	DAART Operations	Other

APPENDIX B: PARTICIPANT FEEDBACK

The following charts illustrate participant responses recorded in the Participant Feedback Forms. TTX participants rated their disagreement or agreement with eight different statements on a scale from 1 to 5, "Strongly Disagree" to "Strongly Agree."

Assessment Factor	Strongly Disagree				Strongly Agree
Exercise documentation helped me participate in exercise discussions.	1	2	3	4	5
The exercise scenario was realistic.	1	2	3	4	5
The exercise lasted for an appropriate length of time.	1	2	3	4	5
The exercise facilitator engaged participants and helped guide meaningful discussions.	1	2	3	4	5
Exercise discussion topics were relevant to my agency's/jurisdiction roles and responsibilities	1	2	3	4	5
Exercise discussion topics were appropriate for someone with my level of training and experience to participate.	1	2	3	4	5
The exercise assisted me with identifying what works well and opportunities to enhance my agencies/jurisdiction capabilities.	1	2	3	4	5
The exercise helped me to further understand other agency's/jurisdiction roles and identified opportunities to partner.	1	2	3	4	5