

**APPENDIX C EARTHQUAKE PREPAREDNESS, ANNEX 25 SPECIFIC IMPACTED HAZARDS, GREENWOOD COUNTY'S EMERGENCY OPERATIONS PLAN**

**EARTHQUAKE PREPAREDNESS**

**Tasked Organizations: Emergency Management Director**

- Suggested Liaison:**
- Duke Energy**
  - CPW**
  - Red Cross**
  - Salvation Army**
  - United Way**
  - SCDSS**
  - SCDHEC**
  - SC Highway Patrol**
  - SC DOT**
  - SC DNR**
  - Self-Regional Medical Center**
  - School Districts #50, 51, & 52**
  - LEPC**
  - Greenwood Humane Society**
  - Chamber of Commerce**
  - CenturyLink**
  - Faith Based Organizations**
  - Lander University**
  - Piedmont Technical College**
  - Buzzard's Roost Dam Management**
  - Boy Scout Leadership Commission**
  - Civil Air Patrol**
  - State Guard**
  - CSX**

**Staff Augmentation as directed by the County Manager**

**I. INTRODUCTION**

- A. This plan establishes specific policies and procedures to be followed by Greenwood County when responding to an earthquake.
- B. Review this annex and the EOP and develop Standard Operation Procedures (SOPs) for each task established by this appendix and the EOP. Insure that the special needs community is factored into the SOP(s).
- C. Annually review the State EOP & Department of Homeland Security Universal Task List and integrate tasks as appropriate.

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## **II. MISSION**

Provide operational concepts unique to earthquake response and assign responsibilities to county departments, agencies, and organizations to meet the needs of local citizens following an earthquake which results in major damage to property and disrupting services.

## **III. CONCEPT OF OPERATIONS**

- a. General.
- b. Unlike other natural disasters, earthquakes occur without warning and could strike anytime. The unpredictable nature of an earthquake and aftershocks will cause great physical and societal impacts over a broad geographic region. It will take years for our communities to recover from a severe damaging earthquake.
- c. Specifics.

1. This plan supports the National Incident Management System (NIMS) which is a nationwide template enabling federal, state, and county, governments and private sector and non-governmental organizations to work together effectively and efficiently to prevent, prepare for, respond to, and recover from domestic incidents regardless of cause, size, or complexity.

2. Basic Plan contains responsibilities, operational concepts, and functional task assignments. The County's Recovery Plan will be the main guidance for which Greenwood County will use in working towards a normalcy from any incident.

3. Emergency Support Functions (ESF) are contained in this plan and describes the actions and responsibilities that function will accomplish.

Response:

- d. Provide concepts unique to earthquake planning and response and assign responsibilities to county departments, agencies, and organizations intended to meet the needs of local citizens following a catastrophic earthquake.

## **IV. SITUATION AND ASSUMPTIONS**

### **A. Situation**

1. An earthquake is a sudden, rapid shaking or trembling of the earth's surface and could be highly destructive. It will occur without warning and a catastrophic earthquake will cause severe damage and a large number of casualties over a wide area. Aftershocks may occur for some period of time, but will diminish gradually over the course of time.

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2. There are two methods of measuring earthquakes, intensity and magnitude. Intensity is measured by the Modified Mercalli Intensity (MMI) Scale that is a subjective measure of damage based on the observed effects of the earthquake. The scale categorizes intensity from I (Mild) to XII (Total Devastation). The Charleston Earthquake of 1886 MMI is estimated at Intensity X.

3. Magnitude (M) is a measure of an earthquake's size. Most earthquakes M less than 3.9 would not cause any significant damage and may only be felt by a few people in the area of occurrence. An M 6.0 earthquake is typically the threshold for causing serious damage. Earthquake magnitude (M) classifications are:

- i. Great = M > 8.0+
- ii. Major= M 7.0 to 7.9
- iii. Large = M 6.0 to 6.9
- iv. Moderate = M 5.0 to 5.9
- v. Minor= M 4.0 to 4.9
- vi. General Felt = M 3.0 to 3.9
- vii. Potentially perceptible = M 2.0 to 2.9
- viii. Imperceptible = M < 2.0

4. Most earthquakes occur along faults or breaks between massive continental oceanic/tectonic plates that collide, slide or separate, creating earthquakes. South Carolina, however, is located in the middle of the North American tectonic plate. Consequently, earthquakes occur less frequently, but more violently over a much greater area due to sub-surface geological conditions.

5. Although, a catastrophic earthquake has not occurred in South Carolina since 1886, there is as limited potential of a large earthquake Greenwood County. This assumption is based on the fact of the earth rock formation in the area. The county citizens may feel seismic movement the intensity will be reach levels of significant damage. Broken windows or collapse of the most fragile structure are the expectations of HUZUS MA analysis.

6. South Carolina experiences several earthquakes annually. These are typically low-level events with magnitudes ranging from less than 1.0 to approximately 3.0. But, generally not felt by people. About 70 percent of these occur in the vicinity of the epicenter of the 1886 Charleston earthquake, a region referred to as the Middleton Place-Summerville Seismic Zone (MPSSZ).

7. A catastrophic earthquake occurring anywhere in the County would result in immediate activation of the Event Operations Center (EOC) However; the most probable location for a catastrophic earthquake event would be Charleston, or possibly Union Counties and surrounding areas.

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### **B. Assumptions:**

1. The possibility of an earthquake in Greenwood County is remote, but possible.
2. If an earthquake would occur of any significant magnitude (M 6.0 or greater) Greenwood County resources would be limited to respond. It is anticipated that significant amounts of external resources will be required for a disaster response.
3. That a Presidential Declaration would be forthcoming.
4. Greenwood County Manager assigned all available county employees to support the EOC. Greenwood County EOC would request through the State EOC immediate support from State resources and the Federal Emergency Management Agency (FEMA). Resources expected are the IMT and Media Response Teams.

### **C. FEMA will activate the National Response Plan.**

D. Damaged transportation roads will not be functional for many weeks or months.

E. Damage to transportation, communication, and other infrastructure systems will isolate

F. For at least 72 hours after an earthquake, affected municipal governments and individuals will be attempting to meet their own emergency needs.

G. Significant aid from Greenwood County or other resources may not be available for 72 hours.

H. Mutual Aid Agreements, Emergency Management Assistance Compact (EMAC), Western Piedmont Regional EM Task Force and other established mutual aid agreements will be activated.

I. Shelters identified for use during other natural disasters, may not be available in the impacted area. Sheltering may take place outside the impacted area.

J. Greenwood County Emergency Response Team(s) (CERT) and Damage Assessment Team (DAT) will be limited in number reporting for duty.

K. The Greenwood County Event Operations Center (EOC) may need to establish alternate Event Operations Centers (EOC) due to possible structural

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damage to the primary EOC.

L. The EOC Logistics Group will be prepared to implement the County Logistics Support Plan.

M. The EOC will activate the Volunteer Reception Center and implement the Disaster Response and Recovery and Donated Goods and Volunteer Services Plans.

N. All EOC Groups will have reviewed and implemented the appropriate sections of the County Response and Recovery Plan.

### **V. ASSIGNMENT OF RESPONSIBILITIES**

A. General:

1. Each element tasked with or in support of an earthquake response will review this annex and the EOP. From that review they will develop Standard Operation Procedures (SOPs) for each task established by this appendix and/or the EOP.
2. Each ESF will insure that the special needs community is factored into their response SOPs.
3. Annually each ESF Group Leader will review the State EOP & Department of Homeland Security Universal Task List and integrate tasks as appropriate.

B. Greenwood County EOC

1. The EOC activation trigger for an earthquake is an M = 6.0. Implementing Instructions for activation of the EOC will be executed and all EOC groups will begin activation of this plan. The EOC will be activated at OPCON 1 level manning. For earthquakes less than a M=6.0, the Emergency Management Director will determine EOC level of activation.
2. ESF Leaders will report to the EOC within two hours upon confirmation of an M = 6.0 earthquake without being notified through established notifications systems.
3. The media will serve as EOC source on the confirmation of an M 6.0 or greater earthquake. ESFs will begin implementing SOPs, agency or organizational response actions according to this Plan.

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4. Each ESF will develop staffing for sustained operations (24/7) for a longterm activation and provide those needs to the EOC Director (EM).
5. When an earthquake occurs, local responders, after providing for family, will activate to respond to the disaster. First priority focus for responders will be in damaged areas. Their initial missions are lifesaving and property protection actions.
6. First responders will provide initial damage assessments as time permits. EMS, Fire and Law Enforcement will be the initial "eyes and ears" of the EOC and expected to provide timely damage assessment information until the EOC Damage Assessment Team(s) can be deployed.
7. Under the conditions anticipated for a catastrophic earthquake, the following responsibilities should be included in EOC planning and preparations:
  8. Have members of the various ESFs participate in hazards materials and damage assessment training to be able to determine the estimated level of damage.
  9. Develop earthquake response checklists for emergency response via WebEOC.
  10. Have ESF-2 and the County Communications Shop develop and/or enhance communication systems for back-up communications should primary systems failed.
  11. Establish and conduct earthquake mitigation and awareness public education programs.
  12. Participate in earthquake response exercises to test functions and plans.
  13. Ensure county alternate EOC has the ability to function in the event the primary EOC is inoperable.
  14. Use the County Situation Report in WebEOC as a guide to provide State EOC with a preliminary damage report. The report should be transmitted as soon as possible, but no later than 24 hours after the earthquake. It can be submitted via radio, fax, or telephone.. The information will assist the State EOC in prioritizing and allocating resources and response assistance. The report information should include but not be limited to:
    - a) The locations of collapsed structures with trapped persons.
    - b) Status of communications systems to include broadcast media.

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- c) Status of transportation infrastructures, i.e., bridges roads, etc.
- d) Locations to provide critical medical assistance.
- e) The operational capability of critical facilities, i.e., hospitals, sewage, waste stations and electrical substations, etc.
- f) Identify locations of significant fire-fighting efforts as well as out-of-control fires.
- g) Hazardous material releases and the impact on the general public.
- h) The extent of damaged areas.
- i) Locations of facilities or open spaces that could serve as shelters.
- j) Public safety needs, i.e., security, traffic control, and law enforcement.

15. Aerial reconnaissance will also be used to obtain disaster intelligence information from the impacted area. EOC will implement coordination with the Civil Air Patrol to ascertain what support is available.

16. All EOC Staff will review the provisions of Appendix J, Annex 25 for appropriate guidance and actions.

C. Community Emergency Response Team (CERT) The CERT Coordinator will coordinate emergency operations in support of EOC. The CERT Coordinator will discuss with the Emergency Management Director training development for continued proficiency of team members in light search and rescue and cribbing techniques.

1. CERT members need to be proficient in the following areas:

- a) Prepare for hazards that threaten Greenwood County.
- b) Ability to apply size up and safety principles.
- c) Locate and turn off utilities.
- d) Extinguish small fires.
- e) Identify hazardous materials situations.

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- f) Assist EMS in triage and treat victims.
- g) Assist EMS in set up a medical treatment area.
- h) Conduct searches and rescues in lightly and moderately damaged structures.
- i) Understand the psychological impact of a disaster on themselves and others.
- j) Organize CERT members and spontaneous volunteers for an effective and safe response.
- k) Apply response skills in a disaster simulation.

2. When a disaster or overwhelming event occurs and responders are not immediately available, CERTs can assist by:

- a) Conducting an initial size-up in homes or workplaces.
- b) Reduce immediate dangers by turning off utilities, suppressing small fires, evacuating areas and helping others.
- c) Treat people in the immediate area.
- d) Work with first responder to establish a command post, staging areas, and medical triage and treatment areas.
- e) Collect damage information and develop a plan of operation based on life-saving priorities and available resources.
- f) Apply their training to situations where CERT members can make a difference.
- g) Establish and maintain communications with responders and the EOC.
- h) Be prepared to assist in the operation of the Volunteer Reception Center and Donated Goods Management.

D. Damage Assessment and DA Teams:

- 1. It is essential for emergency response personnel to take immediate action to gather damage assessment information.
- 2. This information is needed to determine the severity and extent of

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injuries and damages.

3. Further, this data gathering effort should provide much of the information decision makers will need to implement and prioritize response actions for: search and rescue, communications, access and control to the impacted area, debris clearance, mass care, etc.

4. If practical, EOC will activate the County Damage Assessment Team (DAT) to conduct ground reconnaissance to determine the scope of the damage, casualties, and the status of key facilities as soon as possible.

5. EOC will request Civil Air Patrol (CAP) and State Forestry Representatives to conduct an immediate air assessment of rural areas, bridges, and roads. Another source of aerial recon is Duke Energy.

6. In response to DAT assessment, EOC Operations Group will task the following ESF functional areas to accomplish tasks as listed below:

- a) ESF-1 Bridge Inspection Team: conduct structural inspection of critical bridges and recommend safe usage of roads.
- b) ESF-2 Deployable Communications Team: establish communications at the affected area(s) and primary and alternate EOC.
- c) ESF-3 Post-Disaster Inspection Team: conduct structural damage inspection and evaluation of critical facilities in conjunction with local building officials.
- d) ESF-8 Coordinate with available medical responders and private sector medical personnel to provide medical aid to victims.
- e) ESF-10 Coordinate for HAZMAT response: inspect the condition of hazardous material (HAZMAT) facilities in the damaged area.

7. County Response Priorities:

- a) To establish an orderly and manageable system of resource allocation and response actions, EOC Executive Group (County Manager) will be responsible for determining the priorities of effort and allocating resources to operations. Decisions about the allocation of incoming resources and response will be made on the basis of the highest priority lifesaving needs.
- b) For planning purposes it is considered that County-level resources

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will rapidly be exhausted and EOC Operations Group should be prepared to make timely requests for further assistance to the State EOC.

c) EOC members will ensure that response activities within their respective areas are coordinated between the various ESFs and EOC Operations Group and that they are in concert with the priorities and policies established by the EOC Executive Group. Decisions with regard to the allocation of limited resources shall be coordinated and accomplished according to EOC Executive Group decisions.

d) Life-saving operations will be the first priority. After immediate lifesaving needs have been met, the recommended response priorities in support of life-saving operations within the first 72 hours are: (NOTE: Many of these actions will take place simultaneously.)

(1) Communication - Establishing centralized communication to coordinate rescue and response efforts and to determine extent of damage.

(2) Transportation - Assessing transportation roads and bridges to determine structural safety to transport resources and victims to medical facilities in the damaged areas.

(3) Search and Rescue Operations - Search and rescue of victims trapped in collapsed structures and administering first aid.

(4) Health and Medical – Providing medical care and assisting in transporting the seriously injured to triage or functioning medical facilities.

(5) Firefighting - Directing firefighting efforts to the most essential facilities and control of the spread of fires.

(6) Law Enforcement - Providing for the public safety of citizens.

(7) Basic Human Needs / Mass Care - Providing basic mass care (food, water, and shelter).

(8) Hazardous Materials - Inspecting and evaluating the level of hazardous material release and the impact on the public.

(9) Preliminary Damage Assessment - Conducting preliminary damage assessment of critical facilities.

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- (10) Public Information - Providing accurate, consistent, and expedient emergency public information to the public.

### **E. Emergency Management Director**

1. Director's responsibilities for earthquake planning include but are not limited to:
2. Prepare an Incident Action Plan to direct response actions and resource allocations.
3. Coordinate and assist CERT teams in developing earthquake standard operating procedures to include concept of operations, standardized reporting format, and communication needs.
4. Plan for a response and resource deployment to areas that will be isolated as a result of severe transportation infrastructure damage.
5. Prepare loss estimates for earthquake operational area.
6. Coordinate the training of personnel on use of HAZUS loss estimation software.
7. Prepare GIS and HAZUS information systems to display maps to assess, process, and display emergency information about the earthquake.

### **F. All ESF Primary's will take the following actions following a large earthquake.**

1. Immediately report to Greenwood County Event Operations Center (EOC) upon learning of an earthquake greater than M 6.0
2. Greenwood County departments and agencies assigned specific missions as outlined in this plan will develop implementing instructions (SOPs) for all tasks assigned by this plan.
3. Alert and mobilize personnel and resources.
4. Determine the extent of damage related in functional area and the operational capability of all related infrastructure.
5. In order to prepare for an effective disaster response, each ESF representative will provide to ESF-7 a list of equipment shortfalls including sources. ESF-7 will locate the source; obtain a price, and a delivery timeline for the resources. All vendors will be considered. Resources anticipated to be needed immediately after the earthquake are food and

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bottled water, cots, blankets, fuel, and heavy equipment.

6. EOC representatives and/or fire and police will report any disaster intelligence to the Greenwood County Emergency to ESF-5 staff by whatever communication system available.

### **VI. State and Federal Actions (Provided for planning information)**

A. Upon notification from SCEMD that a damaging earthquake has occurred and South Carolina needs assistance, FEMA Region IV will activate the Regional Operational Center (ROC) in Thomasville, Georgia. The Regional Director will notify FEMA national headquarters and request the National Response Plan (NRP) be activated. Before a Presidential Declaration, selected federal agencies may provide assistance to local governments upon request by the Governor and within statutory limits

B. Following a Presidential Declaration, the FEMA Region IV Regional Director will coordinate federal response activities until the appointed Federal Coordinating officer (FCO) arrives on scene.

C. FEMA will activate its Emergency Response Team-A (ERT-A) and Rapid Needs Assessment Teams (RNA) to provide liaison and damage assessment support to the Greenwood County.

### **VII. PLAN DEVELOPMENT AND MAINTENANCE**

A. County EOC (Emergency Management Director) will be responsible for coordinating an annual review and update of the Earthquake Plan by all departments and agencies involved. ESF primaries shall make notification of necessary changes, as they occur, to the Earthquake Program for updating.

B. This plan will be updated to reflect lessons learned from exercises, improved response capabilities, and additional details developed through on-going planning. Annual review and update/revision will be completed no later than September of each year.