

BUZZARD ROOST DAM FAILURE PREPAREDNESS Tasked

Organization: Director, Emergency Management Staff

augmentation as directed by the County Manager I.

INTRODUCTION

A. State and Federal Overview

1. South Carolina has over 50,000 dams throughout the state. Most of these dams are small and are used primarily for recreation. Larger dams are used for the production of hydroelectricity, water supply, and flood control.

2. The Federal Energy Regulatory Commission (FERC), in combination with various power companies and municipalities, regulate the hydroelectric dams affecting South Carolina. The U.S. Army Corps of Engineers (USACE) regulates several dams, dikes, and locks along the Savannah River and one in the Santee River Basin. FERC does not regulate USACE projects.

3. Of the remaining dams, approximately 2313 are large enough to be regulated under state law. Most of these are privately owned and regulated by the SC Department of Health and Environmental Control (DHEC). State regulated dams are divided into three classes: high hazard, significant hazard, and low hazard. Under state law, owners of high and significant hazard dams are required to maintain emergency notification plans.

4. At any given time, any dam may be threatened by upstream flash floods, earthquakes, neglect, or any combination of the above, which can cause personal injury or death, significant high water damage to property or additional failures to dams located downstream.

B. Impact of Buzzard's Roost Dam on downstream lands.

1. General: Most counties in South Carolina have, or are located near dams. In addition, many metropolitan areas, and municipalities could be severely affected.

2. Possible affected infrastructure may include: transportation arteries (interstates, state highways, rail lines, airports); communications, (telephones lines and stations, and broadcast media); public works and engineering outlets (water treatment, sewer, and waste water facilities); firefighting resources (hydrants, tanks, and refill locations); shelters; health and medical facilities (hospitals, EMS stations, healthcare facilities, and cemeteries); hazardous material sites (above ground and underground storage units, pipelines, and landfills); energy providers (electric facilities, distribution lines, and generating stations); law enforcement facilities; animal care facilities (zoos, poultry farms, and family pets, an estimated 60% of residents located in the state have pets, thus requiring some form of sheltering or assistance); special needs requirements (schools, day care, prisons, public recreational areas, transient populations; and governments (local,

state, and federal).

C. Buzzard Roost Dam:

1. Buzzard's Roost Hydro Project (circa 1940) at Lake Greenwood was created between 1935 and 1940 by the construction of the Buzzard's Roost Dam near Chappell, SC. The powerhouse was equipped with three turbines each driving a 5 megawatt AC generator to provide power to the Greenwood area. (NOTE: the physical location of the dam is not in Greenwood County, but in Newberry and any rupture of the dam will not have an immediate effect on the citizens of the county. Saluda and parts of Newberry would be impacted by such occurrence. The only possible significant impact on the citizens would be loss of potable water effecting a population of nearly 70,000)

2. Water was impounded to a surface elevation of 440 feet above sea level, which was later revised to 439 feet above sea level for efficient operations and reserve storage capacity. This facility was built and operated by the Greenwood County Electrification Commission until the Commission was dissolved and the operations folded into the general county administration. In 1966, Greenwood County held a referendum and by a narrow voting margin, elected to sell the transmission lines and the steam generating plant and to lease the powerhouse to Duke Power Company. The lease on the hydroelectric plant continued until 2006, at which time control reverted to the County. County maintain ownership but facilities are managed by SCE&G.

3. The Federal Energy Regulatory Commission (FERC) regulates and oversees the operations and safety of the dam. This includes input of all state and federal agencies in setting rules for operation regarding historical preservations, fish and wildlife habitat, river sustained flows, drawdown curves, fishery issues, and improving public access.

4. Recent years have brought considerable development around the lake. In order to insure that the development takes place in a way that doesn't impact the lake and fishery, the FERC has required that the County become more diligent in the permitting of docks, ramps, and retaining walls to insure that the concerns of the South Carolina Department of Natural Resources requirements for the protection of fish habitat.

5. Main areas affected by a dam failure of Buzzard Roost will be the flooding of the areas southeast and northeast of Ninety Six. The following Bridges will be impassable:

a. The bridge (Wilson Creek/Ninety Six Creek) south of the intersection of Highway 34 and 702 towards Saluda.

b. All bridges located on Hwy 34 Southeast of Ninety Six towards Newberry to the county line (Wilson Creek and Ninety Six Creeks).

c. Hwy 34 directly south of the dam would likely be washed out.

d. The bridge south of Ninety Six on Hwy 246 (Ninety Six Creek).

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- e. The bridge south of Ninety Six on Hwy 248 (Henley and Tolbert Branch Creeks)
- f. The bridge between Hwy 34 and 702 on Island Ford Road (Wilson Creek).
- g. The bridge between Hwy 34 and 702 on Eddy Road (Wilson Creek).
- h. The bridge between Hwy 246 and 702 on Wilson Bridge Road (Wilson Creek).
- i. The bridge north of Ninety Six on Hwy 246 (Wilson Creek).
- j. The bridge on Siloam Church Rd east of Oregon Farm Road turns off (Wilson Creek).
- k. The bridge on Oregon Farm Road between Siloam Church Rd and Old Hwy 246 (Brightmans Creek)
- l. All roads entering Saluda County vicinity Hwy 702 may also be impassable.

II. MISSION

- A. Protect the lives of affected citizens in Greenwood County and assistance to individuals stranded by raising waters.
- B. Provide operational concepts unique to dam failure response and assign responsibilities to County Departments and Agencies.
- C. Establish recovery operations.

Review this annex and the EOP and develop Standard Operation Procedures (SOPs) for each task established by this appendix and the EOP. Each ESF will insure that the special needs community is factor into their SOPs. Annually review the State EOP & Department of Homeland Security Universal Task List and integrate tasks as appropriate.

III. CONCEPT OF OPERATIONS

- A. The County Director, Emergency Management and the EOC are responsible for developing, coordinating, and maintaining procedures to support this Appendix.
- B. The parent company of Lake Greenwood Dam is required to develop, maintain, and exercise emergency action plan (EAP). The parent company is required to completely revise and republish their EAPs every five years or when deficiencies requiring attention are identified.

C. The parent company is responsible for immediately notifying the Greenwood County Event Operations Center as well as the State Emergency Management Division (EMD) of all “at risk” unsafe conditions detected or likely.

D. In coordination with ESFs 1, 6 and 13, Red Cross, and Greenwood County government are responsible for executing evacuation and sheltering operations during dam failures. ESF 13 will insure necessary prior coordination and planning discussions are conducted with all municipal governments affected by a dam failure on necessary actions to be taken to evacuate and secure areas affected by dam flooding..

F. Emergency Response 1.

Alert and Notification

a. General: Alert and Notification procedures are designed to inform and instruct the populace in evacuation planning zones, and to notify federal, state and local emergency response forces. Commercial telephone systems are the primary means for alerting agencies and response elements in the event of a dam failure. These systems are expected to be operational during the initial stages of the emergency to allow notification.

b. Greenwood County Emergency Management Coordinator Notification

(1). Each dam owner (utility/private) is responsible for notifying the State SCEMD Warning Point or EOC, and the Greenwood County EOC of a dam failure emergency. The utility’s Emergency Action Plan describes in detail procedures for notification of specific emergency management organizations. Notification procedures have been developed for both Condition A (failure is imminent or has occurred) and Condition B (potential failure situation is developing) emergency classification levels. They are required to maintain backup communications to include Local Government Radio (LGR), 800 MHz, and/or, a dedicated phone system.

(2). Once an emergency is confirmed at the dam, the owner will issue a Condition A or Condition B, dependent on the severity of the dam breach, simultaneously make internal notification, and notify Greenwood County EOC and other affected counties, State Emergency Management, and the National Weather Service of the situation.

(3). After receipt of initial notification from the utility or owner, the County EOC will review GIS mapping data to determine areas that could be affected and start notification of affected citizens. Coordination will be made with the State Warning Point to ensure they have started notification of downstream counties.

(4). County Event Operations Center (EOC) Activation: The County EOC will fully activate during Condition A and will execute a limited activation during Condition B. which will be situational dependent but, normally consist of the ESFs 1, 2, 5, 6, 8, 12, 13, 15, and 16.

(5). Utilities will activate/operate an Emergency Operations Facility (EOF) at their utility during a dam failure emergency.

c. Alert and Notification of the Populace

- (1). Emergency Alert System (EAS) messages will be broadcast as soon as possible.
- (2). Use of Reach SC phone notification system.
- (3). Tone Alert Radios: Schools, nursing homes, day cares centers and individual households may utilize tone alert radios to receive appropriate advisories.
- (4) Law Enforcement will make personal contact with residence of the affected areas.

d. Communications

- (1). The utility's Emergency Operations Facility (EOF): communications will be maintained through the following means:
 - (a). Regular telephone lines.
 - (b). The County EOC LGR Network and 800 MHz offers the capability for the utility to communicate with the EOC.
 - (c). Region One, Department of Health and Environmental Control (DHEC): utilizes an automated telephonic notification system to notify health care facilities.

e. Evacuation (1).

Condition A:

(a). Utility Response If the utility determines a Condition A exist, the systems controller will initiate their respective call lists, located in each of their Emergency Action Plans. If the capability exists, the system controller may activate the NOAA Weather Tone Alert Radio system, or ask the National Weather Service to activate the Tone Alert Radio. NWS will broadcast a flash flood warning with information about the dam failure and immediate evacuation requirements.

(b) If conditions deteriorate gradually, County EOC will ask SCEMD to make an immediate recommendation to the Governor to evacuate specified areas. If practical, a conference call will be conducted with SCEMD, the EOC, DPS, DOT, and the utility to determine possible evacuation recommendations. However, due to the urgency of the situation SCEMD may have to make an immediate recommendation to the Governor to evacuate selected areas.

(c) County EOCs will initiate EAS messages to provide further evacuation instruction and sheltering information. If conditions deteriorate rapidly, the County EOC has the authority to recommend evacuation.

(2). Condition B:

a. Utility Response. The utility system controller will notify the affected counties, SCEMD and other agencies and corporate personnel of any potentially hazardous situation at the dam. The utility, SCEMD and the County EOCs will coordinate requirements for a precautionary, limited evacuation of areas closest to or just below the dam.

b. County EOCs will initiate EAS messages as necessary. In addition, a conference call will be conducted between SCEMD and the utility to determine possible evacuation and activation of specific notification mechanisms. The utility will provide information to the group regarding the potential for a Condition A declaration. As a precaution, selected areas may be evacuated. EAS times will be coordinated as part of this call. EAS messages will be broadcast as soon as possible.

c. Special Evacuation Requirements

(1). Evacuees who do not have transportation and confined persons who require special transportation will be provided transportation, if available. State assistance will be available upon request. ESF 1 should prepare the necessary resource list of those requiring special transportation and have it readily available for utilization.

(2). Schools and Day Care Facilities: Priority of evacuation assistance will be given to those facilities that have been classified as highly vulnerable. Consideration will be given to evacuating schools early in advance of a general population evacuation. Current information indicates that the school system and day care facilities vicinity Ninety Six, SC will be directly affected by a dam failure at Lake Greenwood.

(3). Health Care Facilities and Nursing Homes: Licensed facilities are required to develop and coordinate evacuation plans. Necessary phone listing of organizations in the vicinity of Ninety Six, SC should be readily available.

4. Re-Entry: Re-entry into the inundated area may not be allowed immediately after the floodwaters recede. Re-entry may be granted only after County determines that hazardous conditions have terminated. After a final decision is made, an immediate announcement to this effect will be made from the EOC.

5. Shelters

a. The American Red Cross will establish which shelters will be available and insure proper staffing and security. Any assistance needed will be coordinated with the County EOC.

b. Special Medical Needs Shelters (SMNS): Self Regional Healthcare is the counties designated SMNS. The County EOC will coordinate with DHEC and Self Regional for movement of special needs patients to their facility.

G. Training (State Overview)

1. The utility, SCEMD, and Greenwood County EOC are responsible for assuring the utility's dam failure training is conducted in accordance with state and federal emergency response requirements.

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2. Drills and Exercises: An exercise simulating a dam failure accident at each utility including participation of emergency response personnel from each of the affected counties will be conducted at least once every 5 years and will be evaluated by federal observers. Coordination will be made with SCEMD for scheduled dates for Greenwood County's exercise.

H. Public Information

1. Dissemination of complete and accurate information to the public in Greenwood County in the event of a failure is essential to promote a controlled response by the population and to instill confidence that necessary actions are being undertaken for the public's health and safety. The public, through the news media, will expect emergency instructions and on-going information regarding the incident from the utility and County. The County's Public Information Officer will insure a steady flow of accurate information to the various media with this county.

2. The County's PIO will establish a Joint Information Center (JIC) where federal, state, and local representatives can respond to media inquiries and ensure an orderly and coordinated release of emergency information. At a minimum, SCEMD, County Public Information Officer, and the utility will provide public information personnel to staff the JIC.

3. Public Education:

a. A public information program should address potential hazards resulting from a failure at the dam, appropriate actions for public self-protection in the event of a failure, and local failure emergency response programs. Ideally, the utility should provide this

information in the form of a pamphlet or brochure which would include the following elements:

(1). Possible causes of dam failures and potential threat to the population as well as property damage.

(2). Public alert and notification mechanisms.

- (3). Appropriate actions for public self-protection.
- (4). Sources of additional information prior to and during an emergency.
- (5). Information relating to county, and the utility's response plans including but not limited to, evacuation sectors, routes, sheltering, and life saving precautions.
- (6). Information relating to special segments of the population including schools, day cares, hospitals/nursing homes, other institutions and physically impaired, mentally impaired and transportation-dependent individuals.

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b. Educational information will be primarily disseminated through the following means: Printed Media: The utility should publish annually a Dam Failure Emergency Information Brochure and distribute it to all households and businesses located in the inundation area. Focus of the information will be targeted to the Ninety Six areas.

I. Recovery

1. Temporary Housing: State and Federal resources will be available once a federal declaration is made and necessary policies and procedures will be disseminated, once activated.

2. Water and Sewer

a. Water:

(1). Within the Inundation Area: Systems within the inundation area may take several weeks or months to repair. Federal assistance will be required.

(2). Outside the Inundation Area: Wells will need to be tested to ensure water is potable in outside areas. Areas without water service will evaluate whether to implement the County Logistics Support Plan (Appendix K, Annex XXV) to establish water distribution points. Close coordination will be made with state and federal agencies.

b. Sewer:

(1). Inundation Area: Systems within the inundation area may take several weeks or months to repair. Federal assistance will be required.

(2). Outside Inundation Area: There may be a number of persons living outside the inundation area without sewer service. Portable toilets will be provided and maintained using a formula of 2 toilets (one male and one female) per 12 homes or as appropriate given the

number and locations affected. Coordination with ESF 7 at the County EOC will be made to implement this service.

IV. ESF ACTIONS

The following actions are specific to dam failure emergency response and are in addition to the actions addressed in the respective annexes in the County Emergency Operations Plan (EOP).

A. ESF-1:

1. Develop transportation support plans to support ESF-13 operations to secure inundation areas and operations to evacuate inundated areas and shelter people from these areas.

2. Develop plans to support local requests to transport personnel.

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3. Identify populations with special transportation needs including schools, health care facilities, nursing homes, and those without transportation. Develop corresponding plans to ensure timely evacuation.

B. ESF-2: Ensure tone alert radios are issued to all schools in the inundation area

C. ESF-3:

1. Notify all water suppliers to store as much water as possible at notification of Condition A or B.

2. Develop plans to obtain bulk and bottled water to support the population without water service outside the inundated areas.

3. Develop plans for debris removal.

D. ESF-6:

1. Identify shelters and develop plans to support emergency shelter and mass feeding operations.

2. Coordinate with American Red Cross Liaison regarding shelter operations at Condition A or B, whichever occurs first.

E. ESF-8:

1. Review inundation area health care facilities and nursing homes evacuation plans.

2. Alert health care facilities located in the inundation area.

3. Develop plans to recover the deceased (to include cemeteries) as a result of dam failure.

F. ESF-9: Develop plans to support swift water rescue operations as a result of a dam failure.

G. ESF-10:

1. Identify hazardous waste facilities in inundation areas.

2. Determine if any hazardous waste facilities are within the inundation areas and develop a notification system to alert them of impending dam failure.

H. ESF 11: Be prepared to implement Annex XI to the County's Emergency operations Plan.

I. ESF-13:

1. Develop plans for securing Lake Greenwood dam to include inundation areas downstream.

2. Develop and coordinate evacuation and traffic management plans.

3. Coordinate and implement procedures to route traffic around affected areas.

J. ESF-15:

1. Assist utilities in the development of a public information program.

2. Provide an authorized spokesperson/representative to support public information activities at the JIC, if one is established.

3. Develop procedures to activate EAS in the event of a dam failure.

K. EOC Logistics Group (ESFs: 1, 2, 11, & 18)

1. In coordination with EP Manager (EOC Director) identify water distribution points to support the population outside the inundation area without water service.

2. In coordination with EP Manager (EOC Director) develop distribution plans for portable toilets to support the population outside the inundation area without water service

V. RESPONSIBILITIES:

A. Director, Emergency Management: 1.

Preparedness

- a . Maintain copies of and review dam emergency action plans to ensure consistency with County EOP.
- b . Assist DHEC and utilities in the conduct of on-going dam safety program, to include public information and education.
- c . Develop evacuation zones from the inundation maps provided by the utilities.
- d . Monitor precipitation forecasts that may contribute to dam failures.

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2. Response

- a. Support utilities during dam failure operations.
- b. Coordinate with local, state and federal agencies to provide assistance in support of dam failure operations.
- c. Coordinate emergency information for public release through ESF-15 (Public Information) in the County EOC.
- d. In coordination with Logistics Group within the EOC identify water distribution points to support the population outside the inundation area without water service.
- e. In coordination with Logistics Group within the EOC develop distribution plans for portable toilets to support the population outside the inundation area without water service

3. Recovery: Resume day-to-day operations as soon as possible.

4. Mitigation; Support mitigation actions, as required.

B. Department of Health and Environmental Control County Liaison

1. Preparedness

- a. Conduct on-going dam safety program, to include public information and education. Coordinate with federal and state agencies to provide assistance in support of dam safety training.
- b. Monitor statewide dam safety occurrences, losses, and cause factors.
- c. Review inundation area health care facilities and nursing homes evacuation plans, if any such facilities exist.
- d. Develop a notification system to alert health care facilities located in the inundation area, if any such facilities exist.
- e. Develop plans to recover the deceased as a result of dam failure.
- f. Identify cemeteries in the inundation area and develop plans to recover remains.
- g. Identify hazardous waste facilities in the inundation area.

2. Response: Provide Liaison to the County EOC.

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3. Recovery: Conduct evaluations of dam failure, related damage and determine improvement methods.

4. Mitigation: Support mitigation actions as required. C.

Utility Owner's responsibilities for the Buzzard Roost Dam.

1. Preparedness

- a. Develop and coordinate dam failure emergency action plans.
- b. Ensure compliance with Federal Energy Regulatory Commission (FERC) guidance.
- c. Inspect dam as required by FERC guidance.
- d. Participate in periodic drills and exercises of appropriate EAPs to ensure plans are accurate and feasible.
- e. Maintain personnel and equipment in a state of readiness appropriate to anticipated dam failures.
- f. Develop a public information program in coordination with the County's Public Information Officer.
- g. Develop procedures to provide timely information and recommendations to the County EOC during both condition A and B situations.

2. Response

- a. Ensure immediately notification if unsafe conditions are detected or likely.
- b. Ensure an initiate warning initial notification system is detailed as an implementing instruction (SOP).
- c. Provide regular information updates to County EOC and the Executive Group.
- d. Provide an authorized spokesperson/representative to support public information activities at the Joint Information Center (JIC).
- e. In coordination with DHEC County Liaison monitor the flood emergency to determine when it is safe for re-entry into flooded or threatened areas.
- f. Prepare and disseminate public information through the JIC.
- g. Secure dam and EOF during either Condition A or B.

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3. Recovery: Phase down operations as directed by/or coordinated with the County EOC.

4. Mitigation: Conduct evaluations of dam failure related damage and determine improvements.

D. Director, Emergency Management:

1. In conjunction with DNR, develop plans to clear lakes and downstream waterways in the inundation area.

2. In conjunction with county and municipal law enforcement authorities, develop and coordinate evacuation and traffic management plans.

E. Greenwood County Sheriff's Office

1. In coordination with all ESF-13 support agencies, develop plans for the implementation of a secure area around the inundation area.

2. Provide a central point of contact for law enforcement services.

3. Provide specialized support assets to include:

a. Support for evacuation (including public address system, rescue, and security operations).

b. Forensic support.

c. Refer any suspected terrorist actions to SLED.

d. Coordinate requirements for additional assets through the County EOC.

F. County Liaison for the Department of Natural Resources (DNR):

1. In conjunction with ESFs 13 and Emergency Services Director develop plans to clear the lake and downstream waterways in the inundation area.

2. Patrol the lake and recreational areas to prevent access downstream from the dam.

G. County Liaison for the Department of Social Services (DSS): In conjunction with American Red Cross (ARC) and the Salvation Army (SA), identify shelters and develop plans to support shelter and mass feeding operations as the result of a dam failure. Implement ESF 11's Annex XI to the Greenwood County Emergency Operations Plan.

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H. The American Red Cross Liaison:

1. Develop plans to support ESF-6 shelter and mass feeding operations.
2. Identify temporary housing locations to support estimated displaced county population.

I. The Salvation Army Liaison: Develop plans to support ESF-6 in mass feeding operations.

J. All county departments and agencies located in or near the inundation area will develop plans to relocate and ensure continuity of operations.

K. Those identified as support departments who are not given specific responsibilities will be available for support operations as determined by Director, Emergency Management.

VI..STATE AND FEDERAL INTERFACE

FERC through the state EOC will mandate dam safety drills and exercises on a scheduled or as warranted basis: