



CHARLEY ENGLISH  
DIRECTOR



JONATHAN R. DANIELL  
PRESIDENT

March 9, 2012

### An Open Letter to the Emergency Management Community

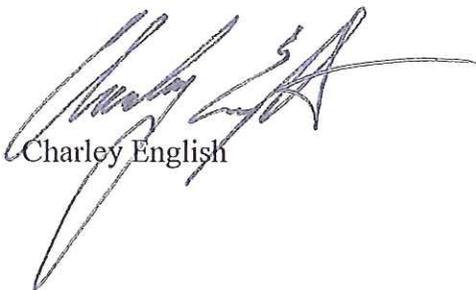
The attached report, Outdoor Warning Sirens Operations and Testing: A Guide for Local Emergency Managers in Georgia was a joint effort of the Emergency Management Association of Georgia and the Georgia Emergency Management Agency with the technical assistance of the National Weather Service. The report includes recommendations for testing, activation and maintenance of Outdoor Warning Sirens.

The goal of this report is to assemble common practices for activating and testing outdoor warning systems throughout Georgia. Comprehensive outdoor warning siren practices elevate the overall effectiveness through increased confidence by the public and provides jurisdictions an opportunity to raise awareness about these systems within their community.

We encourage you to review the attached report and assess the adequacy of your current severe weather and tornado warning notification system. Contact your GEMA Field Coordinator or EMAG District Representative if you would like to discuss strategies to improve your community's overall readiness.

We are very pleased that our two organizations were able to work together to develop and release this Guide. We welcome your comments and suggestions on this report and on other topics that would benefit from our joint review.

Sincerely,



Charley English



Jonathan Daniell

# *Outdoor Warning Sirens Operations and Testing*

## *A Guide for Local Emergency Managers in Georgia*

*Produced by  
Georgia Emergency Management Agency,  
in coordination with  
Emergency Management Association of Georgia  
and National Weather Service*



**EMAG**



**GEMA**

## Introduction

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Outdoor warning systems in Georgia have become a common method for alerting people about the existence of ongoing or approaching life-threatening hazards. Outdoor warning systems include a broad spectrum of components that have various capabilities to warn people of impending hazards. Examples of outdoor systems include variable message boards, speakers, public address systems and sirens. This document offers guidance on the operation and testing of outdoor warning sirens for severe weather.

Activation criteria and testing procedures of outdoor warning sirens vary across jurisdictions. The goal of these guidelines is to identify common practices for activating and testing outdoor warning systems throughout Georgia. Consistent outdoor warning system practices elevates their overall effectiveness through increased confidence by the public and provides jurisdictions an opportunity to utilize public awareness and outreach materials for the purpose of raising awareness about these systems within their communities.

The guidance presented herein only pertains to outdoor warning sirens. Outdoor warning sirens should not be relied upon as the sole source of alert information for persons within a given jurisdiction; rather, they should be one component of a comprehensive, multifaceted alert system. Outdoor warning sirens are intended to alert those who are outdoors to potential severe weather events; they are not designed to be heard inside a structure, especially modern structures that typically feature high insulation values. Other devices, such as NOAA weather radios and smartphones with weather warning applications, as well as local radio and television news coverage, are more appropriate for indoor warnings. Emergency management practitioners should conduct outreach and educational efforts so that the public will understand outdoor sirens activation criteria and the protective actions that should be taken when they are activated. Furthermore, it is recognized that many jurisdictions use outdoor sirens for other purposes, such as hazardous material incidents, potential dam failures, or nuclear power plant warnings. The guidelines in this document pertain solely to the operation of outdoor warning sirens during threats of hazardous weather; specifically, tornados and severe thunderstorms.

## **Outdoor Warning Siren Testing**

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Many types of outdoor warning sirens are available on the open market and are in use throughout the nation. Older models of outdoor warning sirens allow system operators to only conduct audible tests, while newer ones offer the additional ability for conducting inaudible (silent) tests. For systems that have a silent testing capability, outdoor warning system tests should include both test types: silent tests as often as desired or as recommended by the manufacturer, and audible tests as recommended below.

Audible outdoor warning siren tests should be conducted regularly. It is recommended that jurisdictions conduct audible tests of all outdoor warning sirens once monthly on the first Wednesday of the month between 11:00 am and noon in conjunction with the weekly NOAA Weather Radio test. If more frequent tests are desired or required, then a frequency of no more than once weekly should be adopted; however, once monthly is the official recommendation offered. If a jurisdiction resides in areas where NOAA Weather Radio broadcasts are unavailable, then testing at noon is recommended.

Outdoor warning siren tests should always be conducted during "clear sky conditions" (a sky that is clear to mostly clear with few visible clouds). Should weather conditions not meet this criterion during the normally scheduled test, it should be postponed until the next Wednesday that possesses these conditions. Conducting tests during cloudy conditions may lead to misperceptions by the public that cloudy weather always precedes severe weather; this may undermine public trust in the outdoor warning system, and ultimately endanger lives during a severe weather threat. If severe weather is anticipated on a regularly scheduled test day and a Severe Thunderstorm Watch or Tornado Watch has been issued, then the test should be postponed until the following week on the same day and time.

Outdoor warning siren tests should be brief. Each audible outdoor warning siren test should last for one minute. If multiple tones or voice capability is tested, a brief break between each should be observed.

## **Outdoor Warning Siren Operation**

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The authority to operate outdoor warning systems should reside with the jurisdiction's emergency manager, who typically operates under the authority of a county or city commissioner or elected official. All outdoor warning system triggering points should reside at each jurisdiction's 24-hour warning point or a public safety facility that operates and is staffed 24 hours per day. Outdoor

warning sirens have been developed with the capability to create multiple tones and/or voice capability. The recommended tone for a weather-related hazard is a steady monotone with non weather-related hazards having an alternating tone.

The activation of an outdoor warning siren network should have a longer duration than the system test. It is recommended that the outdoor warning sirens sound for 3 to 5 minutes followed by a brief break, then repeated for as long as the threat remains. Lessons learned from previous severe weather outbreaks have shown that repeating the siren during the entire severe weather threat has saved lives.

Outdoor warning sirens should be activated when hazardous conditions pose a threat to life-safety or property. During severe weather threats, outdoor warning sirens should be activated for the threat of a tornado, damaging winds, or destructive hail following the criteria outlined below.

Outdoor warning sirens should be activated for the threat of a **TORNADO** when:

- The NWS issues a **Tornado Warning** for any portion of a jurisdiction where outdoor warning sirens are able to provide an alert.
- A public safety official, or trained storm spotter/SKYWARN storm spotter has visually confirmed an approaching tornado or funnel cloud.

Outdoor warning sirens should be activated during a **SEVERE THUNDERSTORM WARNING** when:

- The severe thunderstorm is capable of producing winds in excess of **80 mph** and/or,
- The severe thunderstorm is capable of producing **tennis ball-sized hail** (2 ½ inch in diameter) or larger.

Activating outdoor warning sirens when the NWS issues a Severe Thunderstorm Warning while under a Tornado Watch is **NOT** advised, unless the above criteria are met. The NWS Severe Thunderstorm Warnings have criteria of wind speed estimated at least 60 mph and hail sizes of one-inch or larger in diameter.

Activating outdoor warning sirens for the threat of lightning or flooding is not recommended. Lightning poses an obvious threat to persons outdoors, and citizens should know to seek shelter upon hearing thunder or seeing lightning. Flooding and flash flooding typically are too localized and offer lead times from the NWS that allow emergency services to implement other mitigation measures.

Severe thunderstorms producing damaging winds in excess of 80 mph can cause trees to drop large limbs. A study conducted by Texas Tech University, which developed the Enhanced Fujita Scale (EF-Scale) system, found that large branches are broken and trees may be uprooted (both softwood and hardwood) at winds near or above 80 mph (EF-Scale damage indicators 27 and 28).

Severe thunderstorms producing damaging winds in excess of 80 mph pose an elevated threat to life-safety and property. In a study conducted by Kent State University on human fatalities due to wind-related tree failures, it was found that during the period from 1995 to 2007, 52% of all deaths associated with severe thunderstorms were due to falling trees or large branches. Of these deaths, 82% occurred when the person was either outside or in a vehicle (only 18% occurred while indoors); therefore, educating people to move indoors is the most prudent protective action when a severe thunderstorm threatens.

The NWS has increased warning accuracy over the years. Severe Thunderstorm Warnings and Tornado Warnings are now issued as polygons that cover only the area threatened rather than entire counties. It is recommended that public officials activate only the outdoor warning sirens in the threat area rather than all of their outdoor warning sirens, if possible.

It is advised that emergency managers **NOT** issue an "all clear" signal on outdoor warning sirens when the threat has abated. Because the best practice is to continually sound sirens throughout the duration of a threat, terminating use of the signal will indicate that the threat has passed.

### **Outdoor Warning Siren Maintenance**

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There are a number of manufacturers that produce a variety of outdoor warning sirens featuring different designs and features. Please consult the user's manual and any other pertinent documentation regarding proper maintenance procedures for the sirens selected by your jurisdiction.

### **Public Education and Outreach**

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To maximize the effectiveness of an outdoor warning system, the public needs to know why the outdoor warning sirens are activated and how to appropriately react to them. It is recommended that outdoor warning system operators/emergency management officials conduct regular public education and outreach efforts to inform people about these systems and the appropriate protective actions to take when they are used.

The recommended protective action for citizens to take when severe weather threatens and outdoor warning sirens are activated is take shelter indoors and seek additional information on the radio (local or NOAA Weather Radio) or television. It is important to educate people to remain indoors until the threat has passed because sirens typically cannot be heard indoors.

To enhance preparedness efforts, communities are encouraged to participate in the NWS StormReady Program, which emphasizes sound practices for preparing for and responding to threats posed by severe weather.

## Special Thanks

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Special thanks is given to the Emergency Management Association of Georgia for providing key information on the current operational practices of outdoor warning sirens in Georgia and to the National Weather Service for providing requisite data on weather-related hazards and review of this document.

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