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## TREND ANALYSIS

### Full Scale Exercises and Real World Events: Analysis of 2007 - 2012 Tornado After Action Reports - Recommendations

#### TREND

The *Lessons Learned Information Sharing (LLIS.gov)* team selected and analyzed 32 tornado after action reports (AARs) published between 2007 and 2012 to develop this Trend Analysis (TA). Eighteen of the reviewed AARs refer to full-scale exercises (FSE) while fourteen focus on response and recovery operations following a real world tornado event.

The TA findings are described in the *Full Scale Exercises and Real World Events: Analysis of 2007 - 2012 Tornado After Action Reports* TA document available on *LLIS.gov*. This document lists recommendations from the AARs.

#### DESCRIPTION

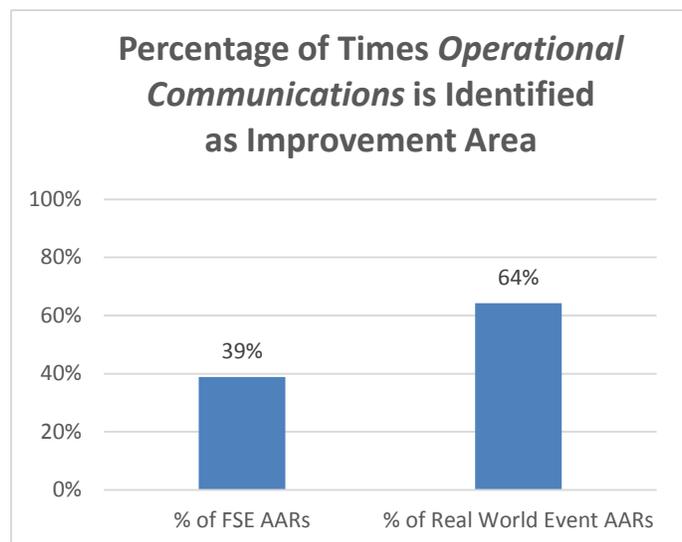
##### **AAR recommendations**

The *LLIS.gov* team reviewed the 32 AARs to identify available recommendations that could assist jurisdictions in addressing areas for improvement. The team found that Operational Communications, Operational Coordination, Planning Training, and Public Information and Warnings were the areas for improvement that incorporated the most relevant recommendations. Examples of these recommendations are listed below.

##### **Operational Communications**

FEMA describes [operational communications](#) as the capability that ensures “the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.”

Sixteen AARs identified operational communications as an improvement area for participating or responding organizations during a tornado FSE or response operations to a real world tornado event. Many of these AARs focused on having correct and routinely updated call lists to reach out and coordinate with response leads and other personnel as well as with schools, hospitals, nursing homes, businesses, and other appropriate partners.



Recommendations listed in these AARs include:

- Routinely update internal and external partner contact lists for the Emergency Operations Center and Dispatch.
- Repeat and confirm orders as well as properly follow dispatch procedures for accountability and tracking purposes.
- Improve coverage, spectrum, or equipment limitations with additional equipment.
- Complete an analysis of what communications each community currently uses and begin to consider moving to a regional system that allows the towns to consolidate systems. On a local basis, determine what resources need updating to allow for better interoperability with outside agencies.

### Operational Coordination

[Operational coordination](#) is meant to “establish and maintain a unified and coordinated operational structure and process that appropriately integrates all critical stakeholders and supports the execution of core capabilities.” Thirteen AARs report that operational coordination represented an area for improvement during a tornado response or an exercise. For instance, some AARs noted that incident command was not properly established.

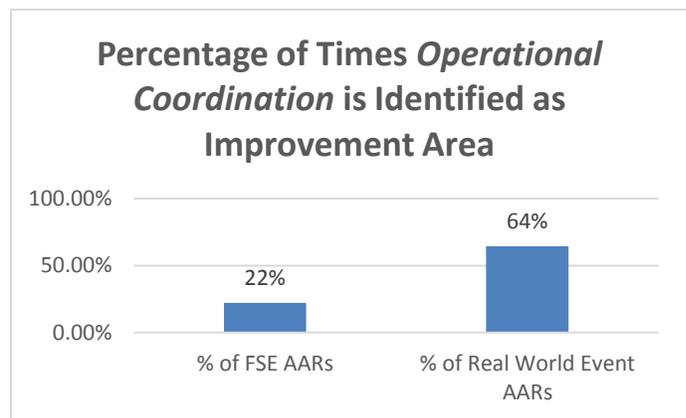
The [2012 National Preparedness Report](#) describes operational communications and operational coordination as areas of national strength. The report states:

**Operational Communications:** “Government partners around the country have established flexible and interoperable communications capabilities built on sound plans and tested through exercises and real-world events.”

**Operational Coordination:** “The National Incident Management System (NIMS) provides a common doctrine for incident management, allowing the whole community to use shared language and principles.”

Recommendations in these AARs include:

- Provide the incident commander with a ICS Form 201 to inform the creation of an Incident Action Plan that can be quickly distributed to the appropriate responders
- Ensure exercises have appropriate representation for testing interactions across agencies
- Modify systems to allow for tracking of required information
- Review current policies and procedures, and update coordination SOPs

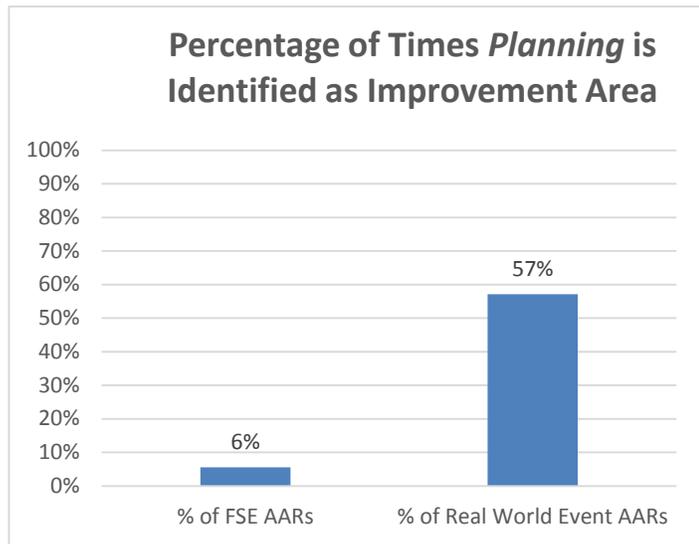


### Planning

FEMA describes [Planning](#) as, “Conduct a systematic process engaging the whole community as appropriate in the development of executable strategic, operational, and/or community-based approaches to meet defined objectives.” Several AARs state that coordinated, advanced planning among agencies did not take place prior to an FSE or a tornado response. In addition, in some cases planning during a response or an exercise was delayed or not effective due to unclear mission, limited operational guidance, and/or lack of specialized personnel.

Recommendations include:

- Develop an interagency planning group that will hold daily meetings to identify 36 hour+ issues and develop incident objectives for inclusion in upcoming Incident Action Plans.
- Maintain multi-agency representation and participation in the Planning Section
- Develop Planning Section SOPs and operational guidance that includes activation criteria and mission description.

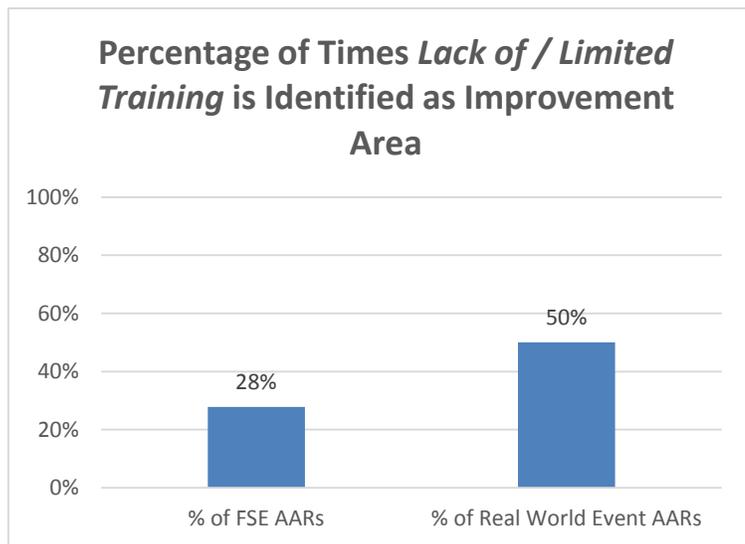


Identify and train staff members who will serve as members of the Planning Section. These personnel should be dedicated to Planning Section operations during

### Training

Issues related to lack of or limited training is mentioned in 12 out of the 32 AARs. These AARs specifically list communication system training as well as training focusing on procedures and roles. Training-related recommendations include:

- Train operators on communications equipment, procedures, and systems
- Develop user guides
- Train personnel on NIMS, ICS, and their EOC functions
- Conduct training that addresses staff turnover issues



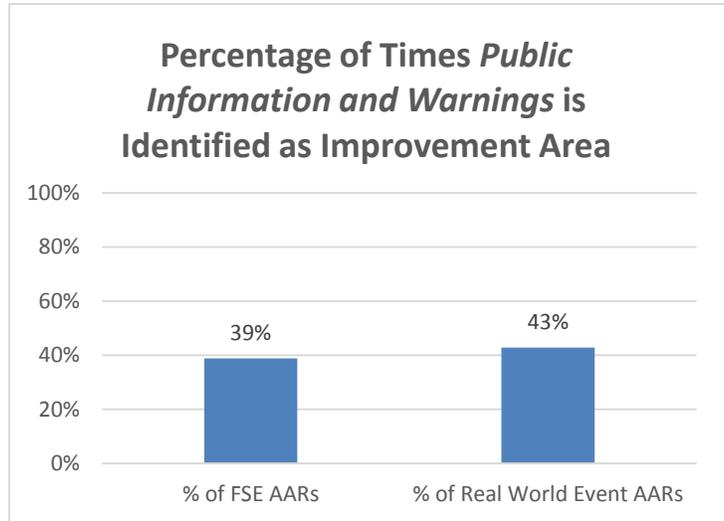
### Public Information and Warning

The [NWS Storm Prediction Center](#) (SPC) in Norman, Oklahoma, is tasked with issuing timely and accurate watches and forecasts related to tornadoes and other extreme weather events. The SPC issues these watches when weather conditions are favorable to tornado development. Early warnings allow emergency managers and responders to provide essential information to the public, deploy staff, and prepare for emergency operations.

Multiple AARs noted that local warning systems could not be used to reach and alert entire at-risk communities. In addition, the analysis found that, in many cases, warning system activation was a time consuming process.

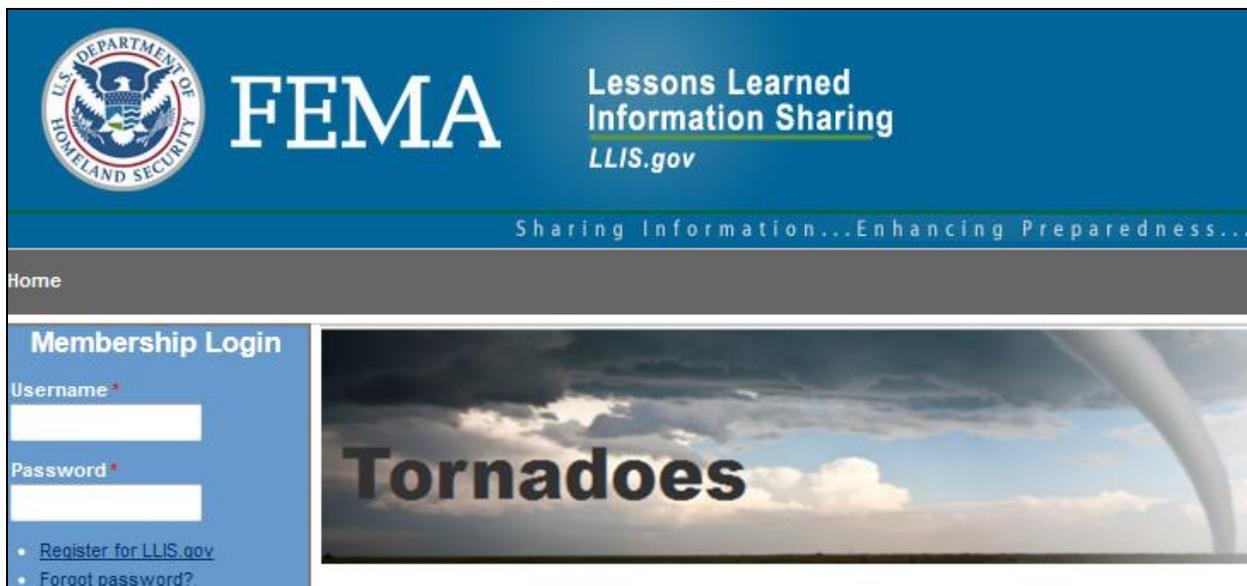
The AARs included the following recommendations, among others, related to these issues:

- Review activation criteria and protocols for sirens and other alert systems to ensure timeliness, FCC compliance, and coordination.
- Routinely test and replace equipment. Validate that alerting systems reach the appropriate audiences at the appropriate strength, or that alternate communications are also in place.
- Educate the public on reliance and effectiveness of outdoor and indoor warning systems.
- Maintain severe weather points of contact, agency officials, and news media notification lists. Routinely coordinate with respective need-to-know agencies and public safety officials to coordinate radio frequencies and obtain essential phone numbers, and email addresses.



### ***The LLIS.gov Tornado Page***

LLIS.gov houses a wealth of resources related to tornado preparedness, response, and recovery in the [Tornado](#) Public Page as well as in the internal library. This page presents the emergency management and response communities with a collection of guidance, plans, and AARs. These documents can help jurisdictions implement the aforementioned recommendations as well as prepare for, respond to, and recover from tornadoes.



## APPENDIX A

### 2007-2012 Tornado Fatalities

According to the NWC Office of Climate, Water, and Weather Services' [Natural Hazard Statistics](#):

- **2012:** Data not available
- **2011:** There were 553 fatalities in 2011; 236 (43%) died inside a permanent home while 147 deaths (27%), were in unidentified locations, and 112 (20%) were in mobile homes (which usually accounts for the most fatalities. Alabama and Missouri recorded the highest number of fatalities for the year (245 and 158 in each State).
- **2010:** There were 45 fatalities in 2010; 19 people (42%) died inside of mobile homes while 11 (24%) died in permanent homes. Mississippi recorded the highest number of fatalities (13), followed by Ohio, Arkansas, Missouri with 7, 6, and 5 each.
- **2009:** There were 21 tornado deaths in 2009; 12 people (57%) died in a mobile home while 5 (24%) died in a permanent home. Oklahoma recorded the highest death toll with 8 fatalities, followed by Arkansas and Missouri with 3 each.
- **2008:** There were 126 tornado deaths in 2008; 55 people (44%) died in mobile home while 43 (34%) died in a permanent home. Tennessee recorded the highest death toll with 31 fatalities, followed by Arkansas and Missouri with 21 and 19 each.
- **2007:** There were 81 tornado deaths in 2007; 51 people (63%) died in a mobile home while 16 (20%) died in a permanent home. Florida recorded the highest death toll with 21 fatalities, followed by Kansas with 21 fatalities.



Source: [ReadyWisconsin](#)

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