

March 2007

EMERGENCY PREPAREDNESS

Current Emergency Alert System Has Limitations, and Development of a New Integrated System Will Be Challenging





Highlights of [GAO-07-411](#), a report to congressional committees

Why GAO Did This Study

During emergencies, the public needs accurate and timely information. Through the Emergency Alert System (EAS), the media play a pivotal role, assisting emergency management personnel in communicating to the public. GAO reviewed (1) the media's ability to meet federal requirements for participating in EAS, (2) stakeholder views on the challenges facing EAS and potential changes to it, and (3) the progress made toward developing an integrated alert system. GAO reviewed the Federal Communications Commission's (FCC) proposed rulemaking on EAS and interviewed media outlets, state emergency management officials, and federal agencies responsible for EAS, including FCC and the Federal Emergency Management Agency (FEMA), within the Department of Homeland Security (DHS).

What GAO Recommends

To improve the media's ability to issue emergency alerts, GAO recommends that DHS and FCC develop a plan to verify (1) the dependability and effectiveness of the EAS relay system, and (2) that EAS participants have the training to issue effective EAS alerts. Also, DHS and FCC should establish a forum for stakeholders to address the challenges of implementing an integrated alert system. In response, DHS agreed with the intent of our recommendations. FCC provided technical comments.

www.gao.gov/cgi-bin/getrpt?GAO-07-411.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Mark Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

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Current Emergency Alert System Has Limitations, and Development of a New Integrated System Will Be Challenging

What GAO Found

According to stakeholders, the media are generally prepared to participate in EAS as required, but EAS has limitations that could affect its performance. Broadcast radio and television, cable operators, and satellite radio operators are required to participate in national EAS alerts, and satellite television will be required to participate in May 2007. Participation in state and local alerts is voluntary. While these media outlets appear generally prepared to participate, FCC has limited measures for ensuring compliance. In addition, stakeholders cited limitations, including an unreliable method for relaying national EAS messages to the public. GAO found a lack of ongoing testing of this relay method. In a national test, three primary relay stations failed, and in one state test, a state representative reported that the message was not received beyond an area roughly 50 to 70 miles from the state capital. Problems with equipment and software caused these failures, which, in a real emergency, could have prevented the public from receiving critical information. Another cited limitation was inadequate training of EAS personnel.

FEMA officials and other stakeholders told GAO that the current EAS faces a range of technical, cultural, and other challenges, such as interfacing with newer communications technologies and issuing alerts in multiple languages. FEMA said the alerting system should provide various means to reach the greatest number of people, and FCC reported that a wide-reaching public alert system is critical to the public safety. In November 2005, FCC proposed changes to improve EAS and address some of the challenges facing it. Stakeholders GAO contacted anticipated positive results from some of the potential changes, such as expanding EAS alerts to additional media, but expressed mixed views on other potential changes. For example, the emergency managers GAO contacted generally favored making the transmission of state and local alerts mandatory, whereas the broadcasters GAO interviewed expressed concern about over alerting, which they said could lead the public to ignore EAS messages.

Several efforts to develop an integrated alert system—one that would provide effective warnings over all broadcast media devices available to the public—are underway. FEMA is conducting various pilots under a public-private partnership called the Integrated Public Alert and Warning System. One such pilot, the Digital Emergency Alert System, uses the digital capabilities of the nation's public television stations to provide public alerts. Another effort, the Warning, Alert, and Response Network Act, is aimed at integrating emergency alerts and enables the participation of wireless providers in EAS. However, FEMA officials and others identified challenges to the implementation of an integrated system, including achieving cooperation among federal, state, and local emergency management organizations on the use of a standardized technology for disseminating alerts. Coordination and collaboration among a variety of stakeholders will be critical to ensure that all elements of the system can work together and produce accurate, timely alerts for all Americans.

Contents

Letter		1
	Results in Brief	2
	Background	5
	Media Appear Generally Prepared for Required Participation in Emergency Communications, but the Current National Alert System Has Limitations	9
	Stakeholders Have Identified Various Challenges Facing the Current Emergency Alert System and Hold Differing Views on the Proposed Changes to the System	17
	Several Projects Are Underway to Develop an Integrated Public Alert and Warning System, but Challenges to Its Implementation Remain	24
	Conclusions	30
	Recommendations for Executive Action	31
	Agency Comments	31
Appendix I	Objectives, Scope, and Methodology	35
Appendix II	Public-Private Partnerships Involved in Emergency Communications	37
Appendix III	Comments from the Department of Homeland Security	40
Table		
	Table 1: Case Study States and Entities We Contacted	36
Figures		
	Figure 1: Flowchart of National-level EAS	7
	Figure 2: FEMA's Vision of an Integrated Alert and Warning System	26

Abbreviations

ABIP	Alternative Broadcast Inspection Program
AMBER	America's Missing Broadcast Emergency Response
CAP	Common Alerting Protocols
DBS	Direct Broadcast Satellite
DEAS	Digital Emergency Alert System
DHS	Department of Homeland Security
EAS	Emergency Alert System
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
MSRC	Media Security and Reliability Council
NAB	National Association of Broadcasters
NCAM	National Center for Accessible Media
NOAA	National Oceanic and Atmospheric Administration
NPR	National Public Radio
NWS	National Weather Service
PEP	Primary Entry Point
PPW	Partnership for Public Warning
SMS	Short Message Service
WARN Act	Warning, Alert, and Response Network Act

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United States Government Accountability Office
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Congressional Committees

Effective emergency warnings via various telecommunications modes allow people to take actions that save lives, reduce damage, and reduce human suffering. Hurricane Katrina and the terrorist attacks of September 11, 2001, highlighted the need for timely, accurate emergency information and underscored the vulnerability of America's emergency response infrastructure. Hurricane Katrina, in particular, severely tested the reliability and resiliency of the communications infrastructure in the Gulf Coast region. For example, according to an independent panel reviewing the impact of Hurricane Katrina, in the aftermath of the storm, approximately 100 broadcast stations were unable to transmit, hundreds of thousands of cable customers lost service, millions of customers' telephone lines were knocked out of service, and even the generally resilient public safety networks experienced massive outages. The Emergency Alert System (EAS), which relies primarily on broadcast media, is one of the mainstays of the United States' capacity to issue warnings. The nation's first alert system was begun in the 1950s as part of America's response to the threat of a nuclear attack, and today EAS remains a tool for the President to issue messages preempting all other broadcast programming. Concern has arisen that the current alert system is inadequate for effectively warning the public about natural disasters or terrorist attacks, as well as for providing information on how to respond to a disaster or attack. The current system was not designed to alert the public on devices other than radios or televisions. The federal government, recognizing some of the shortfalls of the current system, has initiatives underway to improve its reliability, expand it to include new technologies, and integrate the new technologies into the existing alert system.

This report, initiated under GAO's general authority to examine government operations, provides information on issues surrounding emergency communications. In particular, we reviewed (1) the media's ability to meet federal requirements for participating in the Emergency Alert System, (2) stakeholder views on the challenges facing the Emergency Alert System and potential changes to it, and (3) the progress made toward developing an integrated public alert and warning system.

To meet these objectives, we interviewed over 40 representatives of media providers, including radio and television broadcasters, cable companies,

and satellite operators, as well as state EAS contacts, state and local emergency management officials, state broadcasting associations, and local cable associations. For the state and local contacts, we conducted interviews in seven selected states, California, Florida, Kansas, Mississippi, New York, Texas, and Virginia. We selected geographically diverse states that had recently experienced major natural disasters or man-made emergencies. We met with officials of the Federal Communications Commission (FCC), the Federal Emergency Management Agency (FEMA), the Department of Commerce's National Weather Service, and the National Academy of Engineering, a division of the National Academy of Sciences. We reviewed FCC's proposed rulemaking related to EAS and the comments FCC received on the rulemaking. We also spoke with industry trade groups representing broadcast television and radio stations, cable operators, wireless service providers, public television, and the disabled community. A more detailed discussion of our scope and methodology appears in appendix I. We performed our review from April 2006 through January 2007 in accordance with generally accepted government auditing standards.

Results in Brief

According to stakeholders, the media are generally prepared to participate in EAS as required, but EAS has limitations that could adversely affect its performance. FCC requires broadcast radio and television stations, cable operators, and satellite radio operators to participate in national-level EAS alerts. Direct broadcast satellite television operators will become subject to the requirements in May 2007. To ensure that the media can participate in EAS, FCC has requirements for equipment and testing that are a condition of licensing, but it does not require broadcasters to certify their compliance, and inspects, on average, about 2 percent of licensed broadcasters and cable operators per year. While stakeholders told us, and we found during our visits, that media outlets generally appear equipped to issue an EAS alert as required, FEMA officials also told us, and we found, that individual outlets vary in their preparedness to participate in emergency communications. For example, one broadcaster said it conducts training drills and has a disaster plan that includes backup power generators and fuel to sustain operations for 2 to 3 days, while another broadcaster told us it does not have a disaster plan or a backup generator. In addition, stakeholders, including FEMA representatives, told us EAS has limitations that could constrain operations during an emergency. In particular, stakeholders expressed concern about the reliability of the relay system that would be used to disseminate national EAS messages to the public, saying it lacks redundancy and is vulnerable to power outages. Testing of the relay system is not required. As a result, FEMA and FCC

might not be able to assure Congress and the public that the EAS relay system would work in the event of a national-level emergency. Furthermore, in a partial test of the national system, conducted in January 2007, 3 of the 33 available primary relay stations failed to effectively relay the test message.¹ According to a state emergency communications committee, in a state test, the message was not received beyond an area roughly 50 to 70 miles from the state capital. Other limitations of EAS, stakeholders said, were inadequate training of EAS personnel and a lack of coordination among state and local stakeholders. To ensure that EAS is capable of operating as intended, we are recommending that FEMA and FCC develop and implement a plan to verify (1) the dependability and effectiveness of the relay system that would be used to disseminate national EAS alerts, and (2) EAS participants have the training and technical skills to issue effective EAS alerts.

FEMA officials and other stakeholders told us the current EAS faces technical, cultural, and other challenges, some of which may be addressed through proposed changes to the system. EAS provides messages over two media (television and radio), but does not transmit messages via other communications devices that Americans routinely use, such as cell phones, personal digital assistants, and computers. In addition, the current EAS does not facilitate the automatic issuing of alerts in languages other than English, and its alerts are not accessible to some members of the disabled community. According to some stakeholders, another challenge is that while most emergencies originate at the state and local levels, the broadcast of state and local EAS alerts is voluntary. Recognizing that an accurate, wide-reaching public alert and warning system is critical to public safety, FCC proposed changes to EAS in November 2005 to address some of the challenges facing the current system.² Stakeholders we contacted expressed varying views on the proposed changes. For example, most favored expanding EAS alerts to other media, such as landline

¹ One primary relay station was moving and was not available for the test.

² The potential changes contemplate (1) requiring the mandatory broadcast of state and local EAS alerts; (2) expanding EAS alerts to other media; (3) issuing multilingual EAS alerts; (4) making EAS alerts more accessible to persons with disabilities; (5) distributing alerts to media directly, rather than using the hierarchical relay system; (6) establishing performance standards to ensure EAS alerts are accurate and timely; and (7) adopting common alerting protocols for EAS alerts. According the FCC, the Commission circulated a Second Report and Order in the EAS rulemaking proceeding that addresses various issues raised in the November 2005 further notice of proposed rulemaking including (1) extension of EAS to other media, (2) transmission of EAS alerts issued by governors, and (3) issues related to the development of a next-generation EAS.

telephone and wireless service providers. However, stakeholders differed over whether broadcasts of state and local EAS alerts should be mandatory—the emergency managers generally favored this idea, but the broadcasters expressed concern that it could result in overalerting, which could lead the public to ignore EAS messages. Stakeholders also expressed a range of views on whether alerts should be issued in languages other than English and on how alerts could be made more accessible for the disabled.

Several federal efforts to develop an integrated public alert and warning system—one that, ideally, would provide effective warnings at all times, in all places, under all conditions, and over all broadcast media devices available to the public—are underway, yet challenges remain. FEMA is conducting pilot projects under a public-private partnership called the Integrated Public Alert and Warning System. One such project, the Digital Emergency Alert System (DEAS), is testing how the digital capabilities of the nation’s public radio and television stations and other networks—combined with the voluntary participation of cell phone service providers, public and commercial radio and television broadcasters, satellite radio, cable and Internet providers, and equipment manufacturers—can be used to provide alert and warning information to the public and to disaster support personnel. Other FEMA projects are designed to upgrade and expand the relay distribution system, provide more geographically targeted alerting capabilities, and develop an Internet-based alerting protocol for federal, state, and local officials to send and receive alerts using Web technologies. FEMA has also developed an implementation plan that outlines the agency’s vision for an integrated alert system, and legislation has been enacted that enables the participation of wireless service providers in EAS. Despite this progress, challenges remain, including reaching agreement on a standardized technology for disseminating alerts, gaining collaboration among EAS stakeholders to ensure that all elements of the system can work together, providing adequate training for EAS participants, and obtaining adequate funding. Because of the technological complexities involved in developing an integrated alert system, and the need for such a wide range of stakeholders to participate in its development, we are recommending the establishment of a forum to bring all interested parties together for a comprehensive, strategic review of the system’s implementation.

We provided a draft of this report to the Department of Homeland Security (DHS) and FCC for their review and comment. In response, DHS agreed with the intent of our recommendations and provided technical comments that we incorporated as appropriate. See appendix III for written

comments from DHS. FCC provided technical comments that we incorporated as appropriate.

Background

EAS provides capacity for the United States to issue alerts and warnings to the public in response to emergencies.³ Broadcast radio and television stations, cable television systems, and satellite radio operators are currently required to participate in national-level (or presidential) EAS alerts, while participation in state and local EAS alerts is voluntary. To date, EAS has never been used to transmit a national-level alert. The first national warning system was created in 1951 to allow the President to communicate with the nation as part of America's response to the threat of a nuclear attack. The Emergency Broadcast System replaced this system in 1963, and state and local participation was allowed in 1976. In 1997, EAS replaced the Emergency Broadcast System.

For presidential, or national-level, EAS alerts, a hierarchical distribution system would be used to relay the message. Currently, 34 stations have been designated National Primary stations, often referred to as Primary Entry Point (PEP) stations.⁴ As the entry point for national level EAS messages, FEMA directly distributes presidential EAS alerts to the PEP stations. Broadcasts of these national-level alerts are relayed by the PEP stations across the country to radio and television stations that rebroadcast the message to other broadcast stations and cable systems until all EAS participants have been alerted.⁵ The retransmission of alerts from EAS participant to EAS participant is commonly referred to as a "daisy chain" distribution system. FCC requires EAS participants to install FCC-certified EAS equipment as a condition of licensing. Radio and television broadcast stations, cable companies, wireless cable companies, and satellite radio must participate in alerts initiated by the President. By contrast, their participation in state and local alerts is voluntary. Under

³EAS is not part of, or associated with, the Department of Homeland Security's color-coded Homeland Security Advisory System, which advises public safety officials and the public at-large through a threat-based, color-coded system so that protective measures can be implemented to reduce the likelihood or impact of an attack.

⁴FEMA is planning to designate additional PEP stations so that every state and territory is covered by a resilient PEP radio station. FEMA plans to expand the number of PEP stations from 34 to 63; 3 PEP stations will be added in 2007.

⁵FEMA has added a direct national-level EAS connection between FEMA and the public radio satellite and terrestrial backbone so that the national-level EAS messages are sent directly to about 860 public radio stations across the country.

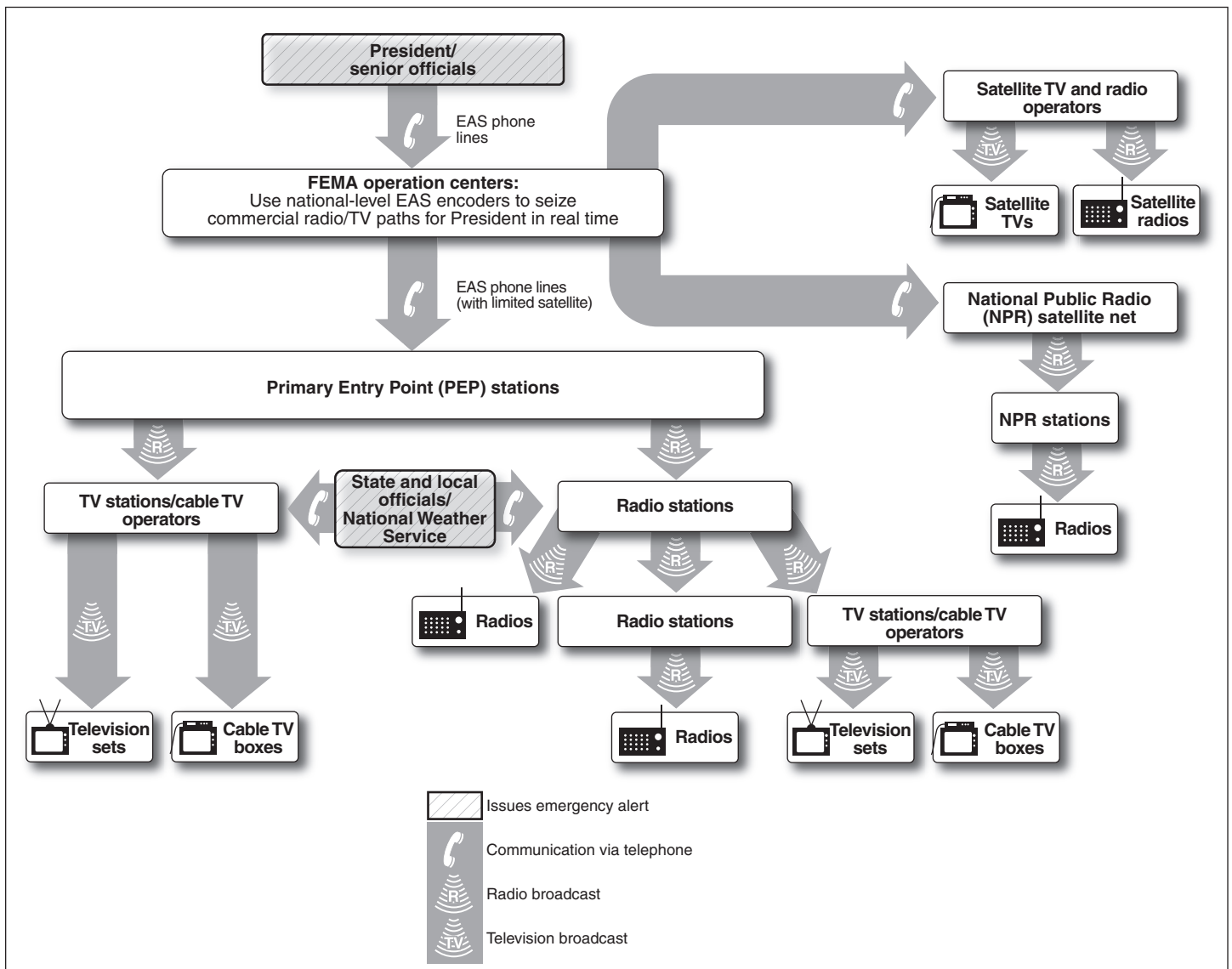
FCC rules, EAS participants have the authority to determine whether to transmit nonfederal emergency messages.

FCC promulgated new rules to include digital media carriage of national-level EAS messages. In an FCC report and order released November 10, 2005, EAS requirements were expanded to include digital communications over digital television and radio, digital cable, and satellite television and radio. Companies using these media will be required to install EAS equipment to handle digital formats.⁶ In a further notice of proposed rulemaking, FCC sought comment on what actions it should take to help expedite the development of a more comprehensive EAS. We discuss the proposed changes and stakeholder views on the changes in greater detail later in this report.

EAS technology uses encoders and decoders (commonly referred to as “ENDECs”) to send data signals recognized as emergency messages. An EAS alert is originated by an alerting official and sent to a broadcaster through an FCC-approved ENDEC. Where agreements have been put in place with broadcasters, EAS messages can be created and activated by state or local officials and transmitted automatically to the public without the intervention of broadcasting staff. These EAS messages can use live or prerecorded audio, including computer-generated text-to-speech audio in some jurisdictions. All EAS messages carry a unique code that can be matched to codes embedded in transmitting equipment; this code authenticates the sender of the EAS message. To facilitate the transmittal of emergency messages, messages are classified by types of events, which also are coded. These event codes speed the recognition and retransmittal process at broadcast stations. Figure 1 shows how national-level EAS alerts are initiated and broadcast.

⁶Satellite radio operators were required to participate in national-level EAS alerts by December 2006, satellite television operators by May 2007.

Figure 1: Flowchart of National-level EAS



Sources: FEMA and GAO.

EAS is part of an overall public alert and warning system under the jurisdiction of FEMA, one of the component agencies of DHS. In June 2006, the President issued an executive order detailing the responsibilities of the Secretary of Homeland Security as they relate to an integrated and comprehensive alert and warning system. These responsibilities include administering EAS as a critical component of the public alert and warning

system. FCC manages EAS participation. FCC currently provides technical standards and support for EAS, rules for its operation, and enforcement within the over-the-air broadcast, cable, and satellite broadcast industries. FEMA works with the emergency response officials, who typically initiate an EAS message for a state or local emergency.

Several organizations work on issues related to EAS. An FCC federal advisory committee, called the Media Security and Reliability Council, has created model disaster recovery plans specific to each media industry—including broadcast radio and television, cable systems, and satellite radio and television. Furthermore, in January 2006, FCC established an independent panel to review the impact of Hurricane Katrina on communications networks. In a report issued in June 2006, the panel made several recommendations to FCC related to EAS.⁷ Other organizations that participate in EAS planning and administration include the Primary Entry Point Administrative Council,⁸ and associations such as the National Association of Broadcasters and state broadcasting associations. States and localities organize emergency communications committees whose members often include representatives from broadcasting companies or local television and radio stations. These committees agree on the chain of command and other procedures for activating EAS alerts. See appendix II for additional information on some of the public-private partnerships involved in emergency communications.

⁷Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, *Report and Recommendations to the Federal Communications Commission*, (Washington D.C.: June 12, 2006).

⁸The Primary Entry Point Administrative Council assists DHS and FCC on matters related to the PEP portion of EAS. The council is also responsible for managing the installation and maintenance of program-related equipment at the PEP radio stations.

Media Appear Generally Prepared for Required Participation in Emergency Communications, but the Current National Alert System Has Limitations

Broadcast radio and television stations, cable operators, and satellite radio operators are required to participate in national-level EAS alerts, and satellite television will become subject to the requirements in May of 2007. These media outlets appear generally prepared to meet these requirements. However, FCC has limited measures in place to ensure compliance with EAS requirements. The participation of media outlets in state and local alerts via EAS, such as weather warnings or other emergency communications issued by state or local entities, is voluntary. While media outlets are using EAS to broadcast emergency information, FEMA officials and other EAS participants that we contacted told us the current system has limitations. Most notably, we heard that the relay system, or daisy chain, around which EAS is designed to disseminate presidential alerts requires additional augmentation to improve its reliability.

Media Outlets Appear Generally Able to Meet Federal EAS Requirements, although FCC Has Limited Measures to Ensure Compliance

FCC requires television, radio, cable,⁹ and satellite radio broadcasters to participate in national-level EAS alerts. As discussed later in more detail, the television, radio, and cable operators we spoke with said they were generally prepared to meet the federal requirements. However, according to FEMA, individual media outlets vary in their technical preparedness to mitigate against damage from a disaster so they can continue reporting and providing critical information. A FEMA official further told us that, in terms of preparedness, broadcasters should develop plans for continuity of operations during emergencies. For example, during Hurricane Katrina the U.S. Coast Guard used the services of a private ship-to-shore communications company because almost all other sources of communications were inoperable.

Broadcast television and radio: Stakeholders such as the National Association of Broadcasters (NAB) stated that broadcasters are the most reliable and robust media outlets for delivering emergency information to the public. According to data from FCC, less than 1 percent of radio and television stations have sought and received waivers from EAS requirements. The broadcasters (both radio and television) that we visited told us they had installed the equipment necessary to issue EAS alerts and indicated that they were prepared to participate in emergency

⁹According to the National Cable and Telecommunications Association, some cable television systems are required by states and localities to participate in local emergency communications through provisions in local cable franchise agreements.

communications. A state broadcasting association that we contacted believes the broadcasters in that state are prepared to participate in emergency communications. Moreover, another state broadcasting association told us its members are well prepared today to issue EAS alerts in large part because of the statewide implementation of the America's Missing Broadcast Emergency Response (AMBER) Alert system. In particular, the association said that the statewide implementation and testing of the AMBER Alert system exposed deficiencies with stations' preparedness to participate in EAS alerts, such as inadequate training in the use of EAS equipment and incorrect coding of the ENDEC. The state association said it addressed these issues by conducting EAS seminars across the state.

Additionally, according to an NAB survey published in 2006, the number of television and radio stations with written disaster recovery plans has increased since 2003. Of those stations responding to NAB's survey, the portion with written disaster recovery plans had increased from 47 percent to 71 percent for television stations and from 15 percent to 49 percent for radio stations from 2003 to 2006. However, it was not clear, from our discussions with broadcasters, how extensively these plans have been implemented and tested. For example, one broadcaster we contacted told us it does not have a disaster recovery plan or a backup power generator at the station. As a result, in the event of a power grid failure, the station could lose the ability to broadcast. However, another broadcaster told us its station had a disaster recovery plan that included a number of safeguards designed to ensure the broadcaster could stay on the air during emergencies. For example, the broadcaster said the plan includes having backup equipment or redundancy mechanisms for all essential equipment, including the EAS receiver, backup generators, and fuel for 2 to 3 days in addition to three separate power feeds connecting the station to the power grid. The broadcaster said it has conducted training drills simulating emergency situations and is continually working to improve emergency preparedness.

Cable: Representatives of the cable industry, as well as officials from cable systems that we contacted, told us cable systems are generally prepared to participate in national EAS alerts as required. Representatives of the cable television industry, as well as various cable systems officials, said cable systems are passive participants in EAS, meaning the cable systems

AMBER Alert System

The AMBER Alert system was developed to help find abducted children. It began in 1996 after the abduction and killing of Amber Hagerman, an Arlington, Texas, girl. AMBER Alerts are issued by law enforcement authorities, who, after they determine a case meets certain criteria, notify broadcasters, who broadcast information about the victim and the abduction. State transportation officials are also notified. Besides through broadcast media, AMBER Alerts can be publicized over the Internet, on highway electronic billboards, on lottery tickets, and to wireless devices such as mobile phones. Currently all 50 US states have statewide AMBER Alert plans, and the Department of Justice is working to create a seamless national network.

typically retransmit EAS alerts automatically.¹⁰ A cable industry representative told us some smaller cable systems have sought and received waivers from the federal EAS requirements. According to FCC, waivers of EAS requirements are currently in effect for 242 cable systems nationwide. These 242 cable systems are very small, each with fewer than 100 subscribers, and represent approximately 8,600 subscribers in total. FCC indicated it grants waivers because compliance with EAS requirements could represent a significant financial hardship for very small cable systems.

One issue that might hinder cable companies' participation in emergency communications is their inability to quickly gain access to their transmission lines for repairs in the aftermath of an emergency. Representatives from a cable system told us local officials often deny cable systems immediate access to repair their transmission lines, which are located with electrical power lines on utility poles, during or after emergencies like severe storms. They said cable companies are unable to repair their lines until power companies have completed any repairs and yielded access to the utility poles. Representatives from another cable system told us that law enforcement officials do not consider cable to be a critical service, a fact that impedes their ability to gain access to their lines and restore cable service after a disaster. They said cable should be considered a critical service, given the increasing role of cable companies in telecommunications and broadband communications and, hence, as conduits in emergency alerts.

Satellite television: FCC does not require satellite television operators to comply with EAS requirements until May 31, 2007.¹¹ However, according to FEMA, the satellite television operators have been working with FEMA to ensure they will be able to disseminate EAS alerts. Additionally, satellite television operators carrying local television stations are currently passing through EAS messages aired on local television stations. According to one

¹⁰A television broadcaster told us that EAS alerts transmitted by cable systems could override the broadcasters' local coverage of emergency events, blocking important late-breaking information with a generic EAS alert. FCC has declined to adopt rules to prevent cable systems from overriding broadcast programming when transmitting state or local EAS alerts. However, it allows cable operators and broadcasters to enter into agreements in which the parties can agree that cable operators will not override broadcast programming when transmitting state or local EAS alerts.

¹¹The satellite television operators, which are also called Direct Broadcast Satellite (DBS) providers, include DIRECTV and EchoStar.

satellite television operator, the new federal requirements pose technical challenges, and to comply with the requirements, the operator would need to develop a system capable of broadcasting alerts on its channels. According to the operator, it is working with FCC engineers to set processes and guidelines to implement EAS, but is still in the early stages of this process.

Satellite radio: Satellite radio operators were required to participate in EAS by December 31, 2006.¹² According to one satellite radio operator, an advantage of using satellite technology is that the transmission of satellite radio is unaffected by disasters on the ground because the satellites transmitting programming are located thousands of miles above the earth. Not only is its infrastructure unaffected by earthbound disruptions, this satellite radio operator indicated it is also able to broadcast from a backup operations center.

While media outlets appeared generally prepared to issue EAS messages, we found FCC has limited measures in place to ensure the media's compliance with EAS requirements, such as those for installing the proper EAS equipment and performing the required system tests. Compliance with FCC regulations and requirements is a condition of receiving a broadcasting license. However, FCC does not have a specific EAS certification as part of the licensing process. Furthermore, FCC does not have a comprehensive program to ensure every licensee complies with EAS requirements. Rather, FCC inspects a limited number of licensees to ensure compliance with federal regulations, including EAS requirements. FCC told us it had conducted approximately 1,800 EAS-specific inspections over the last 3 years—enough to inspect about 2 percent of the licensees subject to EAS requirements each year.¹³ In addition to these inspections, FCC relies on the private sector to conduct inspections through its Alternative Broadcast Inspection Program (ABIP). Under this program, which is administered in conjunction with state broadcast associations, third parties hired by the broadcast associations conduct inspections of broadcasters that mirror FCC's inspections. Broadcasters

¹²At the time of our review, the satellite radio industry consisted of two companies, XM Satellite Radio and SIRIUS.

¹³FCC reported that, as of September 14, 2006, there were 18,749 broadcast stations and 7,183 cable systems subject to EAS requirements. On the basis of the number of inspections reported by FCC over the last 3 years, on average FCC has inspected approximately 2 percent of the licensees subject to EAS requirements per year.

found to be in compliance receive a certification ensuring that FCC will not inspect the station for 3 years under normal circumstances. FCC said it can inspect such a station if, for example, it received a complaint. According to FCC, all states in the nation participate in ABIP agreements. Besides requiring licensees to have the proper equipment, FCC requires them to test their ability to send and receive EAS alerts. Although this equipment testing is mandatory, FCC does not receive confirmation that the tests were conducted properly. However, EAS participants are required to maintain logs of their EAS tests that are subject to FCC inspection and enforcement action in cases of noncompliance.

Media Outlets Broadcast State and Local Alerts Voluntarily

As noted, there has been no national-level EAS alert to date. EAS participants voluntarily broadcast state and local alerts, such as weather warnings or other emergency communications. Some television stations we visited told us they voluntarily issue state and local alerts for business reasons and to serve the public interest. In particular, we heard from two television broadcasters that the local broadcast environment is highly competitive and viewers want emergency information. Consequently, these television stations provide coverage and analysis of emergencies for an extended period without interruptions or commercial breaks. Additionally, in response to Hurricane Katrina, a state broadcast association in the Gulf Coast region told us broadcasters conveyed continuous information about shelters, food, how to locate missing friends and relatives, and where to access assistance.

Satellite television operators, while not yet required to participate in EAS, told us they participate in emergency communications by voluntarily providing services to their subscribers. For example, two satellite television operators told us that when the terrorist attacks of September 11 destroyed the World Trade Center, knocking out broadcasting and cable services in parts of the New York City area and disrupting the transmission of information on the disaster, satellite television operators entered into agreements with broadcasters and cable operators to provide a local broadcast signal, allowing news stations to provide service to their customers during the immediate aftermath of the attacks. Satellite television operators provided this service voluntarily and free of charge. More recently, during the aftermath of Hurricane Katrina, a satellite television operator said it dedicated a channel full-time to disseminating emergency-related information. This channel voluntarily carried messages from FEMA and the American Red Cross, as well as live press conferences from government and public safety officials. Additionally, this channel carried local messages on shelters, transportation, and safety.

Satellite radio operators told us that they carry special emergency channels and other channels that provide critical information in the event of regional or national disasters. For example, one satellite radio operator said it monitors national news organizations, FEMA, and the National Oceanic and Atmospheric Administration and transmits emergency information on its dedicated emergency alert channel during a regional or national disaster. In recent years, for example, this emergency channel has covered Hurricane Katrina, tornadoes in Florida, a chlorine gas leak in Atlanta, and flooding in New England. This operator told us the emergency channel is provided free of charge and can be heard on all the operator's radios, regardless of subscription. Another satellite radio operator told us it offers its subscribers channels that broadcast news, weather, and official emergency information during severe and life-threatening weather events for selected metropolitan areas. This same operator has indicated that it is working to create a text override, which would be displayed on all receivers, directing listeners to turn to the emergency channel.

The Current Emergency Alert System Has Limitations

Although media outlets are using EAS to deliver emergency information, FEMA officials and other EAS participants told us it has limitations. In particular, FEMA officials expressed concern about the reliability of the relay system, or daisy chain, used to disseminate national-level EAS messages. In addition, they expressed significant concern about the reliability of electrical power for broadcast stations during disasters, noting that without electrical power (or fuel for backup generators), a broadcaster cannot issue emergency alerts.¹⁴ Other stakeholders we contacted characterized the relay system as antiquated and also identified potential problems with it. We heard that a lack of redundancy among key broadcasters makes the current daisy chain system prone to failure. For example, the chair of a state emergency communications committee told us redundancy is lacking among the PEP stations, and therefore, if a PEP station were disabled during a disaster in a major metropolitan area, an EAS alert would likely fail to reach a sizable portion of the population. A stakeholder also expressed concern that gaps in radio coverage could hinder the successful dissemination of EAS alerts. In particular, a representative of a state broadcast association we contacted indicated that some radio stations have difficulty in monitoring their PEP because the

¹⁴Concern over electrical power is one of the chief reasons FEMA works with the Primary Entry Point Administrative Council to ensure that some key stations have the fuel and generators necessary to help ensure continuous operations following a disaster.

PEP is located far away in a neighboring state. Stakeholders also said the relay system was too slow to transmit EAS alerts to the public in a timely manner. For example, a technical consultant to a state broadcast association estimated that it would take an hour to disseminate an EAS alert throughout the state. Finally, according to the Media Security and Reliability Council, many states believe the relay system is unreliable and do not believe an alert would reach the entire state in a real emergency.

To improve the reliability of the relay system, FEMA has added satellite uplink connectivity to about 860 public radio stations that can receive national-level alerts from FEMA and provisioned PEP stations in hurricane-affected regions with satellite terminals. In addition, FEMA told us it is planning further efforts in 2007 to improve the reliability of the national-level EAS. These efforts include introducing the Digital EAS program across the country;¹⁵ adding three new PEP sites in Mississippi, Alabama, and Florida; and providing direct FEMA connectivity to key radio and television stations through new communications paths provided by XM Radio and public television.

Despite these efforts to improve the relay system, we found a lack of ongoing testing to ensure that the system would work as intended during a national-level alert. FCC requires individual stations to test their EAS equipment, and FEMA tests the 34 PEP stations, but there is no requirement for a national-level test of the relay system. On January 8, 2007, FEMA conducted an over-the-air national-level EAS test. This test, which FEMA said was the culmination of several years of effort, demonstrated that the connectivity to the public radio satellite uplink worked effectively. However, 3 PEP stations failed to receive and effectively rebroadcast the national-level test message. FEMA attributed these failures to problems with software (2 stations) and hardware (1 station). According to FEMA, these problems have been resolved, but questions remain about the reliability of the relay system, since the test was not designed to reach the nonpublic radio stations that, together with the public radio stations, would be responsible for relaying a national-level alert. Therefore, FEMA and FCC might not be able to assure Congress and the public that the relay system would work during a national-level emergency. Indeed, according to a state emergency communications committee, in a statewide testing of EAS, the relay system did not work as intended and the message was not received beyond an area roughly 50 to

¹⁵For additional information on the Digital EAS program, see the last section of this report.

70 miles from the state capital. The emergency communications committee indicated that the stations' encoders were set incorrectly to receive the emergency alert and control rooms at some of the radio stations were unmanned, so no one was available to manually retransmit the alerts.

Another limitation of the current alerting system, stakeholders said, is inadequate training for EAS participants, both in the use of EAS equipment and in the drafting of EAS messages. During the mid-1990s, FEMA provided training for emergency management personnel through EAS workshops, but it now offers training only for those emergency managers who are participating in pilot projects related to the Integrated Public Alert and Warning System.¹⁶ According to the Partnership for Public Warning, EAS participants require extensive training to properly set up EAS equipment. The Partnership for Public Warning further reported that personnel using EAS equipment often lack proper training and that inadequate training is a main factor preventing the nation from having a unified warning system. It subsequently recommended training for all EAS stakeholders to ensure that they are trained and qualified to perform their roles in the use of the system. Similarly, a presidential advisory group identified that training of industry personnel to use equipment properly is a problem of EAS. State and local officials also identified inadequate training as a limitation of the current EAS. For example, the director of a state emergency communications committee described the lack of EAS training for emergency personnel who craft the messages as the primary challenge facing his state's EAS. The director further noted that turnover among these emergency personnel is frequent and creates a constant need for EAS training. In addition, a state EAS chair described inadequate training of personnel in crafting EAS alerts as a significant limitation. A county emergency manager elaborated, developing a hypothetical example of a poorly crafted EAS message that could unnecessarily panic the public. He said an EAS alert warning of flooding in "West Texas" could be interpreted as referring to a city called West, Texas, or to the entire western portion of the state. If the city alone was affected, but the western portion of the state was understood, the alert could be broadcast far beyond the affected areas, causing unnecessary panic. However, he said, a situation like this could likely be avoided by providing additional instruction for emergency personnel on how to create effective EAS messages. Additionally, a local emergency communications committee

¹⁶For information on these pilot projects, see the last section of this report.

chairman added that local government officials and emergency responders are generally unaware of the capabilities of EAS and underutilize the system. He told us additional training could help address this situation.

A final limitation of EAS that we heard about was a lack of coordination among EAS stakeholders at the state and local levels. A member of a state emergency communications committee said that, historically, there has been little coordination between the media and the state emergency management office and that the broadcast industry had little involvement in his state's initial EAS plan. A participant from the Media Security and Reliability Council noted that coordination among broadcast media and other local stakeholders during emergencies is a major issue that has yet to be addressed. Such coordination could be achieved through the development of detailed regional and local emergency response plans, which would coordinate the actions of local officials and broadcasters in response to emergencies. He said to date, such plans have largely not been developed. In one case, we heard of a lack of coordination among stakeholders on the use of EAS. In particular, a local radio broadcaster, which also serves as a PEP for a major metropolitan area, told us it no longer automatically relays EAS alerts issued by the National Weather Service (NWS). He said broadcasters are displeased with the increase in programming interruptions resulting from NWS's increase in EAS activations.

Stakeholders Have Identified Various Challenges Facing the Current Emergency Alert System and Hold Differing Views on the Proposed Changes to the System

We heard from various stakeholders that the current EAS faces many challenges, making it not fully conducive to the technical capabilities or the cultural needs of the nation's increasingly mobile, disparate, and diverse population. For example, the current system provides alerts via television and radio only and does not issue alerts in multiple languages. In addition, EAS has limited geo-targeted ability—that is, it cannot target alert messages to a specific geographic location, and as discussed earlier, it uses an antiquated relay system that some stakeholders believe is unreliable for disseminating national-level alerts. Even though millions of Americans have hearing loss or vision trouble,¹⁷ FEMA and others have said that EAS has poor alerting capabilities for the disabled community. Furthermore, while we heard that most emergencies originate at the state and local levels, the broadcast of state and local EAS alerts is not federally

¹⁷According to the Centers for Disease Control and Prevention, in the United States, there are 35.1 million adults with hearing trouble and 19.1 million with vision trouble.

mandated. Ideally, FEMA said the system should be able to provide federal, state, and local emergency management officials with multiple means (voice, data, and video using radios, televisions, cell phones, e-mail, computer devices, pagers, sirens, loudspeakers, and other technologies) to inform the broadest possible public with coordinated alerts. Recognizing that an accurate, wide-reaching public alert and warning system is critical to public safety, in November 2005, FCC proposed changes to EAS to address some of these challenges. The potential changes include (1) requiring the mandatory broadcast of state and local EAS alerts, (2) expanding EAS alerts to other media, (3) issuing multilingual EAS alerts, (4) making EAS alerts more accessible to persons with disabilities, (5) distributing alerts to media directly rather than using the hierarchical relay system, (6) establishing performance standards to ensure accurate and timely EAS alerts, and (7) adopting common alerting protocols for EAS alerts. As discussed in the remainder of this section of the report, we found stakeholders' views on the impact of the potential changes varied.

Mandatory broadcast of state and local EAS alerts: As stated previously, the broadcast of state and local EAS alerts is voluntary, and FCC sought comment on whether it should require EAS participants to broadcast state and local alerts. The stakeholders we contacted held divergent views on this proposed change. Supporters of expanding EAS requirements to cover local alerts generally included state and local emergency managers but also broadcast media and cable representatives, who told us they believe the requirement will result in a more effective system. For example, one emergency manager said that all emergencies start locally and EAS needs to consider the needs of state and local entities in order to be effective. A media operator told us it supports this proposed requirement because an effective EAS requires more than the voluntary participation of the media outlets. However, this operator also supports constraints on these requirements to prevent overalerting—that is, issuing so many alerts that the public ignores them. Other supporters suggested conditions for new requirements such as obtaining the support of all stakeholders and leaving the implementation of the requirement to each state.

Media providers and media advocacy groups that opposed the expansion of EAS requirements to cover state and local alerts cited various reasons, including concerns about decreasing the amount of information communicated during an emergency, difficulties filtering large numbers of messages, and business concerns. According to one media operator, mandating state and local EAS alerts could limit the amount of information provided to viewers if an alert providing general or outdated information preempted an alert providing detailed, current information.

The operator also said that it could support the requirement if it specified a time frame for the alert to air, so as to not interrupt coverage. Other opponents of expansion told us that voluntarily issuing state and local alerts allows them to filter out poorly drafted or irrelevant messages. For example, one broadcasters association said that requiring EAS participants to issue state and local alerts would give media operators no flexibility in dealing with badly written messages. This association thinks that if a requirement exists, the originators of EAS messages will have no reason to make certain the messages are clearly worded and their audio quality is high. A media provider also expressed concern about overalerting the public and said the broadcasters need to be able to filter out irrelevant information. According to this provider, voluntary alerts create a balance of power that allows media providers to issue alerts only when they are appropriate, thereby preventing the system from being abused or overused. Other stakeholders maintained that requiring state and local alerts would be an ineffective means of alerting the public because the alerts lack geographic specificity. According to these stakeholders, greater use of widespread alerts by media providers would increase spillover effects—that is, inattention to alerts resulting from the receipt of too many inapplicable warnings. Satellite radio operators also expressed concern about overalerting. Moreover, they told us the national footprint of satellite programming makes issuing state and local EAS alerts problematic, since a local alert would be issued nationwide and all subscribers would receive all alerts. Finally, stakeholders cited business concerns as reasons for opposing this proposal. One media operator said mandatory alerts interfere with business because each hour of programming has a limited number of minutes allotted to sell commercials, and each EAS alert results in lost revenue for the operator.

Expanding EAS alerts to other media: EAS's current reliance on broadcasters, cable systems, and satellite radio providers to transmit emergency messages renders other important communications devices, such as cell phones, personal digital assistants, and computers—devices that many Americans use repeatedly in their daily lives—immaterial for emergency communications. FCC sought comment on including additional media in EAS, such as landline telephone providers and wireless service providers. According to a representative of the commercial mobile (wireless) industry, wireless providers did not favor a mandate requiring their participation in EAS. However, the representative said that major commercial mobile service providers recognize the value of emergency alerts, particularly because of their participation in the Wireless AMBER Alert system, and would be willing to participate in a national emergency alert system that reflects the recommendations of the advisory panel

established by the Warning, Alert, and Response Network Act (WARN Act) to examine this issue.¹⁸

Most other stakeholders favored expanding EAS to other forms of media, saying doing so would ensure that EAS alerts reach a wider audience. Stakeholders believed using multiple forms of media would broaden the reach of an EAS alert, given the trend toward an increasingly splintered media audience and increasing diversity in modern communications. Stakeholders believed an ideal warning system should reach the public through a variety of media forms. Other stakeholders said the expansion of EAS to other media would be fair, given the current EAS requirements for traditional broadcasters.

Stakeholders who did not favor expanding EAS requirements to other media expressed several concerns, suggesting that policymakers should first address the shortcomings of the current EAS before expanding it to other media. A radio broadcaster said any expansion of EAS to other media should not result in additional requirements for broadcasters. Rather, the broadcaster said, the burden of accommodating other forms of media should be the responsibility of EAS alert originators. Another stakeholder questioned the efficacy of expanding EAS to commercial mobile service devices (i.e., cell phones), claiming such networks are likely to become overloaded and fail in an emergency.

Multilingual EAS messages: EAS alerts provided only in English might not be understood by non-English speakers living in the United States. Until FCC and the media address this issue, FCC proposed that multilingual emergency information be provided in areas where a significant proportion of the population is primarily fluent in a language other than English. FCC asked for comment on other proposals about how best to alert non-English speakers. The stakeholders we contacted had divergent views in terms of requiring multilingual alerts. The majority of broadcasters we spoke with were not in favor of mandating multilingual alerts, preferring compliance to be voluntary. They cited numerous challenges associated with requiring multilingual alerts, including potential technical difficulties to issue alerts in more than one language at a time. In particular, we heard it is difficult to transmit clearly worded and

¹⁸The Warning, Alert, and Response Network Act was enacted on October 13, 2006, as title VI of the Security and Accountability for Every Port Act, Pub. L. 109-347. Additional information on the act can be found in the last section of this report.

recoded messages on time for multilingual alerts, and that if two separate messages were issued (one in English and one in another language), the equipment might construe the first message as an error and delete it. Any message delays could have negative consequences for the public. Broadcasters and others expressed a fundamental concern about choosing how other languages would be chosen to issue the alerts. Some broadcasters serving major metropolitan areas told us many languages are spoken in their communities, so it would be problematic to choose just one non-English language for the EAS alerts. One broadcaster told us his radio station does not have the staff to translate EAS alerts into other languages, but if the station received the multilingual alerts, it would try to pass them along.

One emergency manager we contacted voiced support for multilingual alerts and believed that requiring them is long overdue, especially in communities that are becoming increasingly diverse and economically disadvantaged. Furthermore, one broadcaster's association mentioned that during Hurricane Katrina and its immediate aftermath, as many as 300,000 people were without emergency information because they did not speak English fluently and emergency information was unavailable in any language other than English. Another emergency manager told us that some rural counties in his state have large migrant worker populations that do not speak English; however, there are no emergency communications targeted to non-English speakers in those areas.

Accessibility to persons with disabilities: According to the National Center for Health Statistics, there are approximately 54 million adults in the United States with some level of hearing or vision trouble. FEMA and others have said EAS has poor alerting capabilities for the disabled community. FCC said that it is committed to ensuring that persons with disabilities have equal access to public warnings and are considered in emergency preparedness planning. FCC sought comment on making EAS alerts more accessible to people with disabilities. While stakeholders were not opposed to making alerts more accessible, many believed accessibility could be addressed at the individual level. For example, eight stakeholders we interviewed said that improving access to EAS alerts for the disabled could be done at the individual level. According to these stakeholders, access can be improved through multiple sensory alerting devices, such as bed shakers, vibrating pagers, and flashing lights, as well as by subscription to additional alert systems, which deliver important emergency alerts, notifications, and updates during major crises. One stakeholder we interviewed told us about a system that sends emergency

information to registered devices such as e-mail accounts, cell phones, text pagers, satellite phones, and wireless personal digital assistants.

Organizations representing the disabled have said that individuals with hearing and vision disabilities are subject to inconsistent aural and visual information in EAS alerts. They also told us that because of inadequate captioning during breaking news events and the lack of an audio description of crawling text alerts, those with hearing and vision disabilities can miss vital information during emergencies. One organization said that disabled individuals currently have less access to EAS messages than they did in the past, because video alert messages include only truncated versions of audio alert messages, make increased use of crawling text and on-screen graphics with no related audio information, and do not comply with related captioning mandates.

The National Center for Accessible Media (NCAM), a research and development facility dedicated to media and information technology issues for people with disabilities, compiled a working draft of information requirements intended to improve access to emergency alerts. According to NCAM's information model, a warning message should be compatible with various transmission systems and provide warning message details in text, audio, multiple languages, and images or other visual forms. Additionally, NCAM's information model recommends the use of multiple presentation forms appropriate to the needs of individual recipients; the appropriate use of font size, foreground/background color, and other visual attributes in image and text presentations; and the use of appropriate language for comprehension by the at-risk audience.

Point-to-multipoint distribution of EAS alerts: The current EAS uses a relay system to distribute national-level emergency alerts, which—as mentioned previously—some EAS participants view as unreliable. FEMA has added satellite uplink connectivity to approximately 860 public radio stations so that they can receive national-level alerts directly. FCC sought comment on whether EAS alerts should be distributed directly to media outlets in a point-to-multipoint distribution system, rather than through the relay system. The stakeholders we contacted who offered opinions on this issue overwhelmingly favored the point-to-multipoint distribution, but some expressed concerns about the technical difficulties associated with its implementation. For example, a representative from a PEP station expressed concern that implementing a point-to-multipoint system would be challenging given the increasing prevalence of automated stations in the commercial radio industry. The representative also expressed concern that stations located in downtown areas might not be able to receive alerts

in a satellite-based system because buildings often block the sight lines that are required to receive such satellite signals. According to a state broadcast association representative and a broadcast engineer, a point-to-multipoint system would require more levels of redundancy than EAS currently has. The engineer further told us that attempts to develop a satellite-based point-to-multipoint alert distribution system in his state had been unsuccessful despite significant investments of time and funds.

Performance standards: Currently no performance standards exist to ensure that the American public receives accurate, timely alerts and warnings. FCC sought comment on whether performance standards are necessary. Most of our interviewees agreed that developing performance standards would help to ensure accurate, timely alerts. According to one emergency manager, developing performance standards is very important because everyone learns from mistakes, so the system would continue to improve and the public would be more likely to receive accurate and timely alerts. A broadcast association representative told us that FCC should have a role in determining performance standards for EAS alerts to ensure high-quality messages and proper standards for operating EAS equipment.

Common alerting protocols: Endorsed by many entities responsible for alerts, Common Alerting Protocols (CAP) might offer the most practical means of quickly creating an effective interface between the emergency manager and multiple emergency alert systems to improve national alert and warning capability. FCC sought comment on whether common protocols are necessary for the rapid flow of emergency alerts to the public. The majority of stakeholders we contacted who were knowledgeable about CAP supported its adoption. According to Society of Broadcast Engineers comments filed with FCC, CAP will provide a universal language that can be understood by the growing array of digital communication devices. The comments indicated that CAP has the potential to become the language translator not only for incoming and outgoing warnings but also for non-EAS alerts and advisories. For example, CAP's capabilities can be used to trigger sirens, which would benefit those with visual impairments. According to a chief information officer of one state, adopting CAP is the key to success for any public warning system. However, the system should be open—that is, nonproprietary. He further said that CAP should evolve through an inclusive process that takes into account the opinions and needs of all stakeholders, including television, radio, microwave, and satellite services providers, among others.

Several Projects Are Underway to Develop an Integrated Public Alert and Warning System, but Challenges to Its Implementation Remain

According to FCC, several federal initiatives are underway to improve, expand, and integrate existing warning systems. For example, FEMA is conducting various pilot projects under a public-private partnership called the Integrated Public Alert and Warning System and has also developed an implementation plan that outlines its vision for an integrated alert system. Legislation has also been enacted that enables the participation of wireless service providers in EAS. Despite this progress, FEMA officials and other stakeholders said challenges to the implementation of an integrated system remain, including issues associated with coordination, training, and funding.

FEMA Pilot Projects and Other Initiatives Aim to Integrate the Emergency Alert System

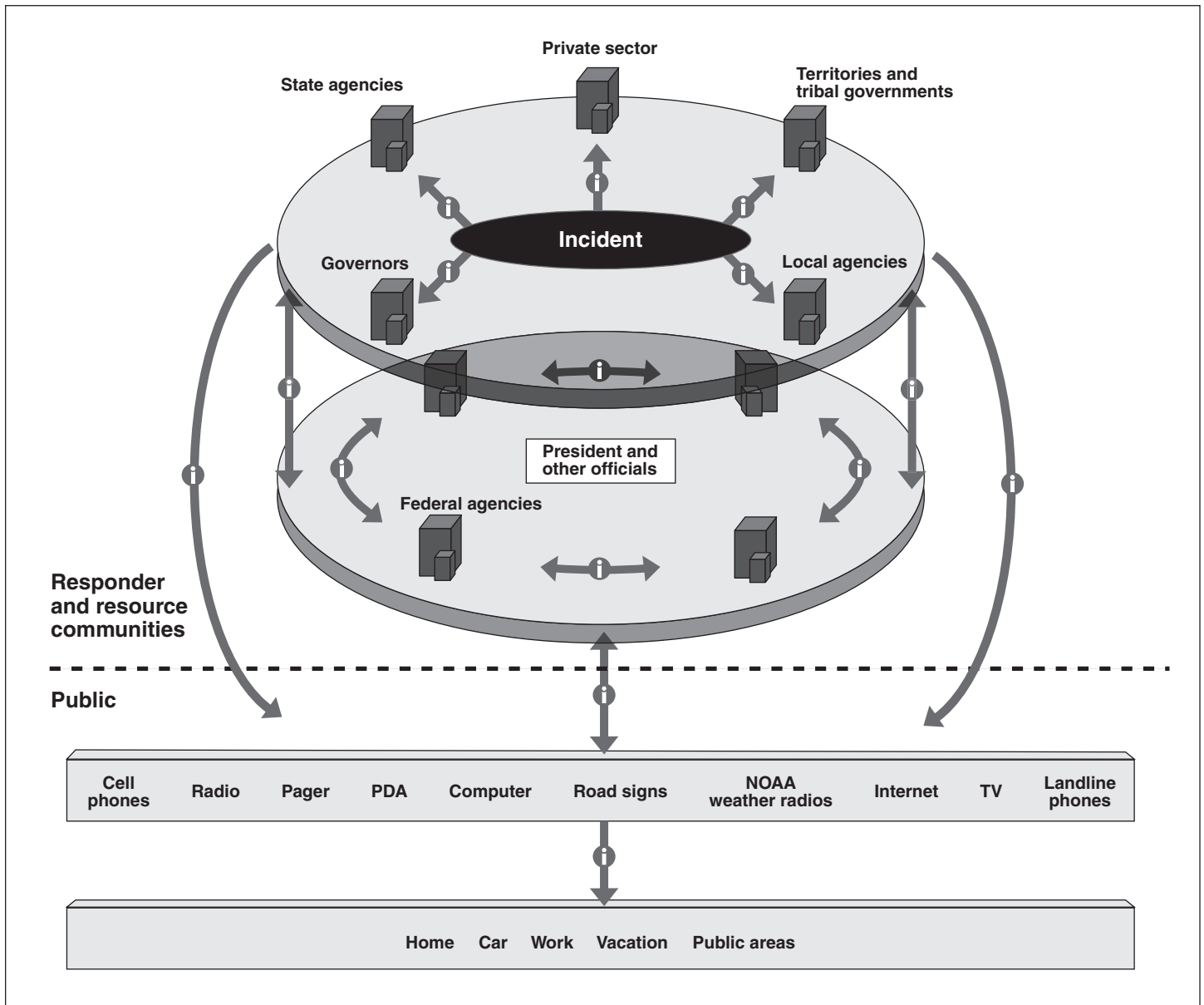
FEMA officials told us they are trying to develop a technologically enhanced alert and warning system that provides effective warnings at all times, in all places, under all conditions, and over all broadcast media devices available to the public. According to FEMA, the new integrated system will build on the current EAS and leverage advanced communications technologies to provide additional methods of originating and disseminating EAS messages. The agency has established various pilot projects related to the development of an integrated public alert and warning system. One such pilot, called the Digital Emergency Alert System, is testing how the digital capabilities of our nation's public radio and television stations and other networks—combined with the voluntary participation of cell phone service providers; public and commercial radio and television broadcasters; satellite radio, cable, and Internet providers; and equipment manufacturers—can be used to provide alert and warning information to the public and to disaster support personnel. As stated by FEMA, a goal of the pilot is to expand the system so that everyone, regardless of location or time of day, will receive emergency information. The national DEAS pilot will run for 1 year beginning in January 2007, with all public broadcasting stations (over 300 nationwide) to be DEAS-enabled by December 2007. In conjunction with DEAS, FEMA plans to upgrade the existing EAS network. To provide a resilient PEP radio station for every state and territory, FEMA plans to eventually expand the number of PEP stations from 34 to 63, and will add 3 PEP stations in 2007. FEMA has also recently provided satellite connectivity to 15 existing PEP radio stations in hurricane-affected states and territories (12 states and 2 territories). Furthermore, FEMA is working with the Primary Entry Point Administrative Council to provide equipment and technical support to five radio stations in the Gulf Coast states (Texas, Louisiana, Mississippi,

Alabama, and Florida) to help ensure they are prepared for the 2007 hurricane season and other future storms or disasters.

Other FEMA initiatives include the (1) development of the Geo-Targeted Alerting System, (2) piloting of the DHS Web Alert and Relay Network, and (3) provisioning of National Oceanic and Atmospheric Administration (NOAA) all-hazards radios for public schools. The Geo-Targeted Alerting System is a pilot program to integrate near-real-time weather and hazard predictions and provide geo-targeted alerting to homes, buildings, and neighborhoods via cell phones, landline phones, pagers, desktop computers, sirens, and other geo-aware devices. This pilot is planned to conclude in 2007 with the development of a national Geo-Targeted Alerting System deployment plan. The Web Alert and Relay Network is a pilot program to enable federal, state, and local officials to send and receive alerts using Web technologies, and to provide links to state and local alert and warning Web pages. This relay network pilot started in 2005 and is expected to extend to all states and territories by 2011. Last, DHS has provided all-hazards NOAA weather radios to 16,000 public schools and plans to ensure that all remaining public schools in the United States have the radios by 2011.

FEMA has also developed an implementation plan outlining its vision for an integrated alert system, which FEMA summarizes as “one message over more channels to more people at all times and places.” The plan outlines various tasks related to executing the integrated alert and warning system that are designed to ensure, among other things, that the President can alert and warn the American people under all conditions. One key task is for FEMA to consult, coordinate, and cooperate with private and public sector entities, including communications media organizations and federal, state, territorial, tribal, and local governmental authorities, including emergency response providers, as appropriate. As shown in figure 2, with an integrated alerting system, FEMA envisions coordinated messages traveling over more channels to reach the public through multiple media devices, including cell phones, pagers, road signs, and the Internet, as well as the existing EAS technologies.

Figure 2: FEMA's Vision of an Integrated Alert and Warning System



Source: FEMA and GAO.

Stakeholders Cited Challenges to the Implementation of an Integrated Alert System

Also related to the development of an integrated alert system is the enactment of the WARN Act.¹⁹ The act requires FCC to complete a rulemaking proceeding to adopt relevant technical standards, protocols, procedures, and other technical requirements necessary to enable commercial mobile service providers (wireless providers) to issue emergency alerts. The act provides for the appointment of an advisory panel, called the Commercial Mobile Service Alert Advisory Committee,²⁰ to recommend the technical specifications and protocols that will govern wireless providers that choose to participate in emergency alerting. The advisory panel is to submit its recommendations to FCC within 1 year of October 13, 2006, the date of the act's passage. Subsequently, the act requires FCC to complete rulemaking proceedings to adopt relevant technical standards and to allow wireless providers to transmit emergency alerts. Thereafter, wireless providers will have 30 days to elect to participate in emergency alerts. Wireless providers must either choose to participate in emergency alerting or inform both their new and existing customers that they do not provide this service. Thus, if the act's deadlines are met, wireless providers will be able to elect to participate in emergency alerts starting not later than September 2008. The committee is chaired by the FCC Chairman and includes 42 other members representing stakeholders in government (at the federal, state, local, and tribal levels), the wireless communications industry, broadcasters, the disabled community, and other subject area experts.

FEMA officials believe an integrated alert system will have advantages over the current system but told us challenges to its implementation remain. A key challenge, FEMA said, is gaining the cooperation of federal, state, and local emergency management organizations on the use of a standardized technology for disseminating alerts. Many believe a standardized technology, or common messaging protocol, is necessary to distribute simultaneous messages over multiple platforms. Additionally, we believe the implementation of an integrated alert system will require collaboration among a variety of stakeholders to ensure that all elements of the system can work together and can convey accurate, timely emergency alerts to all Americans. According to FEMA's implementation plan, consulting, coordinating, and cooperating with diverse stakeholders are cornerstones in the effective execution of the public alert and warning

¹⁹P.L. 109-347, title VI.

²⁰The Commercial Mobile Service Alert Advisory Committee was not established as a federal advisory committee. The committee held its first meeting on December 12, 2006.

system. Furthermore, the plan says all of the FEMA pilot projects require regular interaction with private sector and media organizations. However, there does not appear to be a collaborative, consensus-based forum for all interested stakeholders—public and private—to work together to develop processes, standards, systems, and strategies related to implementing an integrated system. The Partnership for Public Warning previously existed as such a forum, and its objectives included fostering communication, cooperation, and consensus among key stakeholders; promoting and conducting research and studies on alert and warning issues; assisting and advising government officials on the development, implementation, and operation of public warning systems, technologies, policies, and procedures; and supporting the timely generation of standards, specifications, and protocols. In the absence of such a forum, coordination might continue on an ad hoc, rather than a strategic, basis. According to one stakeholder, federal efforts to develop an integrated system have focused thus far on the ability of EAS to deliver a national alert, to the exclusion of state and local needs. In particular, a state emergency manager told us his organization, which has developed an advanced alert system, had not been contacted by FEMA regarding its experience in the system’s design or implementation.

Extending alerts to wireless providers is another challenge to the implementation of an integrated alert system that stakeholders identified. In general, commercial mobile services networks are designed for point-to-point communications, whereas EAS today relies on broadcasters for point-to-multipoint communications. Commercial mobile services (i.e., wireless) networks are not currently designed to broadcast messages on a point-to-multipoint basis like television and radio networks. Instead, wireless networks currently send messages by a point-to-point design in which network traffic is routed to and from individual recipients using database and switching technology. Given their point-to-point design, these networks generally only have the capacity to serve a certain percentage of subscribers at any one time. Because wireless networks are designed for point-to-point communications and do not have the capacity to serve all subscribers simultaneously, a representative of the industry told us wireless providers would be unable to deliver a national-level EAS alert on a timely basis. FEMA told us it plans to use CAP to accommodate cell broadcast, SMS,²¹ and other various transmission standards so that

²¹SMS is the Short Message Service format, a standard for delivery of text messages that is currently available to a majority of wireless subscribers.

one-way alerting messages can be distributed through wireless networks. As required by the WARN Act, the Commercial Mobile Service Alert Advisory Committee is addressing the technical issues currently affecting the participation of wireless providers in emergency communications.

In addition to these technical challenges, stakeholders have noted that other challenges currently facing EAS will also face an integrated system, including the challenges associated with accessibility, training, and funding. FEMA, for example, has said that the difficulties involved in making EAS alerts accessible to non-English speakers and to the disabled will likewise be barriers to the development of an integrated alert and warning system. Similarly, the Congressional Research Service has observed that incorporating technologies that expand the reach of EAS for people with special needs, such as those with disabilities, the elderly, and those who do not understand English, at a reasonable cost, is one of the challenges of delivering an effective warning system that is truly nationwide. Advocates for the disabled have expressed particular concern about the costs of purchasing the additional equipment that the disabled may need to receive emergency information through individualized means. According to these advocates, the cost of such equipment generally falls on the disabled consumers, who, the advocates told us, are more likely to have limited financial resources than other consumers. As a step toward addressing the accessibility challenge, FEMA said it is planning to conduct pilot projects during the 2007 hurricane season to show how the Integrated Public Alert and Warning System will provide more effective alerts for disabled communities in the future.

Providing adequate training in the proper use of emergency alert equipment and in the drafting of effective alert messages will remain a challenge in developing an integrated system. As noted, the Partnership for Public Warning identified inadequate training as a main factor preventing the nation from having a unified warning system and recommended training for all EAS stakeholders. A state emergency manager also told us that training of all stakeholders is vital to a comprehensive alert and warning system, and a state broadcasters association representative said training is the only way to address the possibility of human failure, which he described as the key challenge in developing an integrated system. Stakeholders further emphasized the importance of training emergency personnel to develop well-crafted alert messages that the public will be able to understand and act on appropriately. To address the training challenge, FEMA is developing a Web site that will provide general EAS and other public alert and warning training for emergency managers. FEMA expects this Web portal to have

full operational capability in 2008. However, strategies to convey training information, coordination with a variety of government and other stakeholders who can facilitate an EAS training environment, and measures to ascertain the program's effectiveness have not been completed and tested.

Finally, FEMA cited a lack of funding as a challenge to the implementation of the integrated system. According to FEMA, it is currently funded to provide enhanced public alert and warning capabilities primarily in three states (Louisiana, Mississippi, and Alabama), and significant additional funding is required to field integrated public alert and warning system improvements across the rest of the United States.

Conclusions

The ability to communicate reliable emergency information to the public is critical during disasters, and effective emergency warnings allow people to take actions that could save lives and property. While EAS is one of the mainstays of the nation's capacity to issue such warnings, its reliability is uncertain. With no requirements to test the relay system for disseminating national alerts and with no nationwide test results—apart from the partial test conducted in January 2007, in which three primary relay stations failed to transmit or receive the emergency message—the public lacks assurance that the system would work in a national emergency. Although several federal initiatives are underway to integrate existing warning systems and FEMA is planning to nearly double the number of primary relay stations in order to increase the system's redundancy, these initiatives have just begun to receive funding and are likely to take years to implement. In the meantime, questions remain about the reliability of EAS's relay system.

Adequate training for all EAS participants is critical to ensure that they are qualified to use the equipment and to draft effective emergency messages that the public will be able to understand and act on appropriately. Despite the federal government's efforts to integrate and improve EAS, the system will be ineffective if the public ignores alerts or does not take appropriate action based on the information provided.

Effectively implementing an integrated alert system will require collaboration among a broad spectrum of stakeholders, including those at the federal, state, and local levels; private industry; and the affected consumer community. FEMA believes that the effective execution of the public alert and warning system requires consulting, coordinating, and cooperating with diverse stakeholders. However, a regular forum for

public and private stakeholders to discuss emerging issues related to the implementation of the integrated alert system does not exist. Without such a forum, coordination among the diverse stakeholders could occur on an ad hoc basis, but there would be no systematic means of bringing all interested public and private stakeholders together for a comprehensive, strategic review of the processes, standards, systems, and strategies related to the implementation of the integrated public alert and warning system.

Recommendations for Executive Action

To ensure that the Emergency Alert System is capable of operating as intended and that coordination with a variety of stakeholders on the implementation of the integrated public alert and warning system exists, we recommend that the Secretary of Homeland Security direct the Director, FEMA, to work in conjunction with the Chairman, FCC, to take the following actions:

- Develop and implement a plan to verify (1) the dependability and effectiveness of the relay distribution system, which is used to disseminate national-level EAS alerts, and (2) that EAS participants have the training and technical skills to issue effective EAS alerts.
- Establish a forum for the diverse stakeholders involved with emergency communications to discuss emerging and other issues related to the implementation of an integrated public alert and warning system. Representation on the forum should include relevant federal agencies, state and local governments, private industry, and the affected consumer community.

Agency Comments

We provided a draft of this report to DHS and FCC. In its response, DHS agreed with the intent of our recommendations and noted that FEMA will continue to conduct regular tests of the system in coordination with FCC to include the new quarterly “over-the-air” tests of the national-level relay. DHS also provided technical comments that we incorporated into the report as appropriate. Written comments from DHS are provided in appendix III. FCC provided comments via e-mail and noted that its staff circulated a Second Report and Order addressing various issues raised in the November 2005 further notice of proposed rulemaking including (1) extension of EAS to other media, (2) transmission of EAS alerts issued by governors, and (3) issues related to the development of a next-generation EAS. Further, FCC provided technical comments that we incorporated into the report as appropriate.

We are sending copies of this report to interested congressional committees; the Secretary of Homeland Security; the Chairman of FCC; and the Director of FEMA. We will make copies available to others upon request. The report is available at no charge on GAO's Web site at <http://www.gao.gov>. Contact points for our offices of Congressional Relations and Public Affairs may be found on the last page of this report.

If you or your staff have any questions concerning this report, please contact me at (202) 512-2834 or goldsteinm@gao.gov. Key contributors to this report were Sally Moino, Assistant Director; Hamid Ali; Aaron Kaminsky; Bert Japikse; Mick Ray; Jennie Sparandara; and Deborah Winters.

A handwritten signature in black ink, appearing to read 'M. Goldstein', with a long horizontal flourish extending to the right.

Mark L. Goldstein
Director, Physical Infrastructure Issues

List of Congressional Committees

The Honorable Joseph I. Lieberman
Chairman
The Honorable Susan M. Collins
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Ted Stevens
Vice-Chairman
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Henry Waxman
Chairman
The Honorable Tom Davis
Ranking Member
Committee on Oversight and Government Reform
House of Representatives

The Honorable John D. Dingell
Chairman
The Honorable Joe Barton
Ranking Member
Committee on Energy and Commerce
House of Representatives

The Honorable Edward J. Markey
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The Honorable Fred Upton
Ranking Member
Subcommittee on Telecommunications and the Internet
Committee on Energy and Commerce
House of Representatives

The Honorable Jose Seranno
Chairman
The Honorable Ralph Regula
Ranking Member
Subcommittee on Financial Services and General Government
Committee on Appropriations
House of Representatives

The Honorable Dennis J. Kucinich
Chairman
Subcommittee on Domestic Policy,
Committee on Oversight and Government Reform
House of Representatives

Appendix I: Objectives, Scope, and Methodology

This report, initiated under GAO's general authority to examine government operations, provides information on (1) the media's ability to meet federal requirements for participating in the Emergency Alert System, (2) stakeholder views on the challenges facing the Emergency Alert System and potential changes to it, and (3) the progress made toward developing an integrated public alert and warning system.

To meet these objectives, we collected information from various stakeholders on the Emergency Alert System (EAS), challenges facing EAS and proposed changes to it, and efforts to develop an integrated system. In particular, we interviewed representatives of media providers, including radio and television broadcasters, cable companies, satellite television and satellite radio operators, state and local emergency management officials, and state broadcasting associations. We also interviewed officials with the Federal Communications Commission (FCC), the Federal Emergency Management Agency (FEMA), the National Weather Service (NWS), and the National Academy of Engineering. In addition, we met with industry trade associations, including the National Association of Broadcasters, the National Cable & Telecommunications Association, the Wireless Association (commonly referred to as CTIA), and the Association of Public Television Stations, and with two organizations representing the disabled—the National Council on Disability and the National Center for Accessible Media. We analyzed data on the number of waivers to EAS requirements that FCC granted to media providers. Additionally, we reviewed FCC's proposed rulemaking related to EAS and the comments FCC received on the rulemaking.

To obtain information from the state and local levels, we employed a case study approach. The case studies consisted of interviews with state and local officials and representatives in seven states: California, Florida, Kansas, Mississippi, New York, Texas, and Virginia. We selected these states because of their recent experience with natural disasters or man-made emergencies and their geographic diversity. We interviewed state and local emergency management officials, state broadcasting association directors or officers, and representatives of other media organizations involved in emergency communications, including local broadcast radio, television, cable systems, and National Weather Service Forecast Offices. Table 1 provides more detailed information on the states and localities we selected and the entities we interviewed.

Table 1: Case Study States and Entities We Contacted

State	Emergency management	State association of broadcasters	Media	National Weather Service
Kansas	<ul style="list-style-type: none"> • State emergency management • Kansas City 	<ul style="list-style-type: none"> • Kansas Association of Broadcasters 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television 	
Virginia	<ul style="list-style-type: none"> • State emergency management • Fairfax County 	<ul style="list-style-type: none"> • Virginia Association of Broadcasters 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television • Cable system 	<ul style="list-style-type: none"> • Washington, D.C./Baltimore Forecast Office
Mississippi	<ul style="list-style-type: none"> • State emergency management • City of Jackson 	<ul style="list-style-type: none"> • Mississippi Association of Broadcasters 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television 	<ul style="list-style-type: none"> • Jackson Forecast Office
Florida	<ul style="list-style-type: none"> • State emergency management • City of Tallahassee 	<ul style="list-style-type: none"> • Florida Association of Broadcasters 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television 	<ul style="list-style-type: none"> • Tallahassee Forecast Office
New York	<ul style="list-style-type: none"> • State emergency management 	<ul style="list-style-type: none"> • New York State Broadcasters Association 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television • Cable system 	
Texas	<ul style="list-style-type: none"> • State emergency management • City of Fort Worth 	<ul style="list-style-type: none"> • Texas Association of Broadcasters 	<ul style="list-style-type: none"> • Broadcast radio • Broadcast television • Cable system 	<ul style="list-style-type: none"> • Fort Worth/Dallas Forecast Office
California	<ul style="list-style-type: none"> • State emergency management • Contra Costa County 	<ul style="list-style-type: none"> • California Broadcasters Association 	<ul style="list-style-type: none"> • Broadcast radio 	<ul style="list-style-type: none"> • Los Angeles/Oxnard Forecast Station

Source: GAO.

Our analysis identified issues at the state and local level that would not be apparent in nationwide discussions or analysis. However, because we used a case study method, our results are not generalizable to all states and localities. We performed our work from April 2006 through January 2007 in accordance with generally accepted government auditing standards.

Appendix II: Public-Private Partnerships Involved in Emergency Communications

Various public-private partnerships work on issues related to EAS, including the Media Security and Reliability Council, the independent panel established to review the impact of Hurricane Katrina on communications networks, and the Partnership for Public Warning. Information on these entities follows.

Media Security and Reliability Council: The Media Security and Reliability Council (MSRC) is a federal advisory committee established by FCC to study, develop, and report on communications and coordination designed to ensure the optimal reliability, robustness, and security of the broadcast and multichannel video programming distribution industries in emergency situations.

MSRC's mission was to prepare a comprehensive national strategy for securing and sustaining broadcast and multichannel video facilities throughout the United States during terrorist attacks, natural disasters, and all other threats or attacks nationwide. Additionally, MSRC was to develop and provide recommendations to FCC and the media industry on detecting, preparing for, preventing, protecting against, responding to, and recovering from terrorist threats, natural disasters, or other attacks on America's infrastructure and people. Members of MSRC, including senior representatives of mass media companies, cable television and satellite service providers, trade associations, public safety representatives, manufacturers, and other related entities, developed, among other things, best practice recommendations, model documents, and other resources. For example, the council developed best practice recommendations for media companies aimed at helping to (1) ensure the security and sustainability of broadcast and multichannel video facilities throughout the United States; (2) ensure the availability of adequate transmission capability during events or periods of exceptional stress due to natural disasters, man-made attacks, or similar occurrences; and (3) facilitate the rapid restoration of broadcast and multichannel video programming distributor services in the event of disruptions.

In addition, MSRC developed model vulnerability checklists and disaster recovery plans for local radio and television stations, cable systems, and satellite operators. In particular, MSRC's best practices recommended that each national media facility have a vulnerability assessment and a disaster recovery plan that is periodically reviewed, updated, and practiced. A disaster recovery plan enables the media provider to assess the vulnerability of and impact on critical systems and to recover operations and essential services in the event of a natural or man-made disaster or other emergency. Topics covered in the disaster recovery plan include

vulnerability assessment and prevention, plan distribution and maintenance, staff roles and responsibilities, essential equipment and materials, internal and external communications, emergency procedures, recovery and restoration procedures, and periodic plan testing. Documents and additional information on MSRC can be found on its Web site, <http://www.mediasecurity.org/>.

Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks: FCC established the panel to (1) study the impact of Hurricane Katrina on the telecommunications and media infrastructure, including public safety communications; (2) review the sufficiency of the recovery efforts with respect to infrastructure; and (3) make recommendations for improving disaster preparedness, network reliability, and communication among first responders in the future. In June 2006, the panel issued a report summarizing its findings.¹ According to the report, Hurricane Katrina had a devastating impact on the communications networks in the Gulf Coast region because of flooding, lack of power and fuel, and the failure of redundant pathways for communications traffic. The panel reported that state and local officials did not use EAS to provide localized emergency evacuation and other important information. According to the panel, because EAS was not activated, inconsistent or erroneous information was sometimes provided within the affected area. The panel also reported that a major challenge was ensuring that emergency communications reach Americans who have hearing or vision disabilities or do not speak English. The panel made several recommendations to FCC related to EAS. For example, the panel recommended that FCC take action to revitalize EAS by (1) educating state and local officials, as well as the public, about EAS; (2) completing its proceeding to explore the viability of expanding EAS to other technologies; and (3) exploring the viability of establishing a comprehensive national warning system that complements existing systems. The panel made other recommendations aimed at making alerts more accessible for persons with disabilities and non-English speakers.

Partnership for Public Warning: The Partnership for Public Warning (PPW) was a public/private not-for-profit institute that worked to promote and enhance efficient, effective, and integrated dissemination of public

¹Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, *Report and Recommendations to the Federal Communications Commission*, (Washington D.C.: June 12, 2006).

warnings and related information so as to save lives, reduce disaster losses, and speed recovery. PPW was created as a nonprofit consortium for the government, private industry, and the public to work together to identify the major challenges to improving the nation's public warning capability and reach consensus on effective solutions and strategies. Participants included state and local emergency managers, private sector industry executives, nonprofit organizations, representatives of academia and of special needs constituencies such as the deaf and hard of hearing, members of the public, and federal agencies.

Given that EAS serves as the United States' primary national warning system, PPW conducted an assessment of the system to provide a definitive description and evaluation of it. This assessment was used as a basis for recommending ways to make immediate improvements to EAS in areas where PPW identified significant policy, management, and operational challenges. According to PPW, this assessment was a major factor behind FCC's notice of proposed rulemaking in 2005, which sought comment on actions needed to expedite development of a more comprehensive system.

In addition to its work helping support of EAS, PPW said that it was responsible for developing and promoting the first common alerting protocol, focusing national attention on the need to improve public warning capabilities by educating senior government executives and the public, and producing a consensus-based national strategy and implementation plan for creating a more effective national capability to warn and inform citizens during times of emergency. While PPW is no longer active, additional information can be found at <http://www.ppw.us/ppw/>.

Appendix III: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

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**Homeland
Security**

March 8, 2006

Mr. Mark L. Goldstein
Director, Physical Infrastructure Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Goldstein:

RE: Draft Report GAO-07-411, Emergency Preparedness: Current Emergency Alert System Has Limitations and Development of a New Integrated System Has Challenges (GAO Job Code 543161)

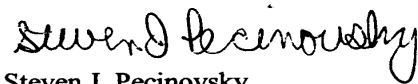
The Department of Homeland Security appreciates the opportunity to review and comment on the draft report referenced above. The Government Accountability Office (GAO) makes two recommendations to the Administrator at the Federal Emergency Management Agency (FEMA) and the Chairman of the Federal Communications Commission. The recommendations are designed to ensure that the Emergency Alert System operates as intended and that coordination with stakeholders on the implementation of the integrated public alert and warning system exists. We agree with the intent of the recommendations.

We agree that additional planning and effort is required to ensure that the relay system upon which the Emergency Alert System (EAS) depends is reliable and effective and that EAS participants have the training to issue effective EAS alerts. To that end, FEMA will continue to conduct regular tests of the system in coordination with the Federal Communications Commission (FCC) to include the new quarterly "over-the-air" tests of the national-level relay. In addition, FEMA, in coordination with the FCC, will continue to work to fulfill the requirements of Executive Order 13407, Public Alert and Warning System, which includes: (1) assessing how well the current system works, (2) implementing improvements to the overall system, and (3) improving the training for EAS operators as well as making the system more user friendly.

GAO also recommends that FEMA, working in conjunction with the FCC, establish a forum for the diverse stakeholders involved with emergency communications to discuss emerging and other issues related to the implementation of an integrated public alert and warning system. FEMA recognizes the need for Federal, state, and local stakeholders to work together to rapidly improve the public alert and warning "system of systems." To that end, FEMA will continue to meet regularly with the FCC and other community

stakeholders to ensure that the evolving public alert and warning systems will effectively protect life and property. For example, FEMA and the FCC are working closely together through such forums as the Commercial Mobile Services Alert Advisory Committee (CMSAAC) to address the challenges of implementing an integrated alert system. In addition, FEMA will continue to work with the FCC, Commerce's National Oceanic and Atmospheric Administration, and other stakeholders through our Integrated Public Alert and Warning System (IPAWS) pilot programs to ensure that all stakeholders are able to participate in the improvement process. Finally, FEMA will continue to sponsor IPAWS meetings and conferences, as well as participate in other related meetings, to ensure effective coordination is occurring among alert and warning stakeholders.

Sincerely,



Steven J. Pecinovsky
Director, GAO/OIG Liaison Office

MMcP

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